UNIVERSITY OF CALIFORNIA, IRVINE

Proposal for a School of Design at the University of California, Irvine

November 2002

UCIrvine
University of California, Irvine

Table of Contents

Executive Summary

The School of Design described in this proposal will immediately make UC Irvine an international leader in this field, and it will position us at the forefront of a small number of research institutions that are transforming the way design is taught and practiced around the world. The school will be based on a comprehensive, interdisciplinary approach that investigates the conceptual and theoretical foundations of design processes and methodologies. That inquiry will be focused on four primary areas of specialization:

- interaction design: interactions between humans, the machines and products they build, and the technological and informational systems that support their use;
- product design: theories and methods underlying the conceptualization and creation of new products, including principles for innovation, decision analysis, and team management; the integration of emergent technologies and new materials; marketing and business strategy; and cultural issues associated with the production and use of new products;
- spatial design: development and organization of space and environment, ranging from small interiors of vehicles or houses to larger exterior spaces, and including the technological enhancement of physical space such as virtual reality or auditory imaging; and
- design studies: inquiry into a general theory or science of design based on research and scholarship in current practice and methods, and in the history and philosophy of design and related fields.

The objective of the School of Design at UC Irvine will be to advance our intellectual and scientific understanding of the theory and practice of design, including processes of decision-making and team management as well as the materials and techniques of production; to train students in the technical and aesthetic dimen-

sions of the field; and to comprehend the broader cultural issues associated with the contemporary role of design in our world today. It will focus on the implementation and application of a wide variety of innovative enabling technologies. Instruction will include undergraduate and graduate degrees, with a significant component of professional master's programs as described below.

The School of Design will help focus the interests of faculty and students now distributed in several units across campus. It will significantly expand the scope and visibility of scholarship and research at UC Irvine, and it will multiply opportunities for productive interaction with business and industry. In addition, it will allow us to respond to a rare opportunity presented by the explosive growth in design worldwide and by a profound change in its social, economic, and technological functions. A wide range of factors have combined recently to increase the general public awareness of design as a profession and as an influence in daily life, and to elevate the importance of design in manufacturing and engineering, management and marketing, as well as public policy.

For example, design has come to play a much larger role in the strategic planning of corporations in general, especially regarding plans for innovation and development of new products in an international setting, and designers now often hold senior-level management positions in major corporations. Design now encompasses more than the issues, technologies, and agents involved in creating and using artifacts, processes, and built spaces. It also is expected to address a wide range of philosophical principles and political objectives, and to convey our collective sense of history, aesthetics, and cultural diversity.

The expanded role of design has, in turn, imposed new demands on designers. They are now called upon not only to produce new products but also to manage the processes by which the products are produced and to understand more about the ways products are used and the people who use them. In addition, more than ever before, designers are required to have a global perspective on their work and to investigate and articulate the principles and methodology behind the designs through systematic research, experimentation, intellectual inquiry, and theoretical speculation. They are also expected to communicate their findings and contribute to a body of knowledge that constitutes the basis for an emerging academic discipline and a true science of design.

Today's new designers require a new kind of training that goes beyond the traditional apprenticeship and practice-based programs associated with most academic design programs in the past. Those programs developed first in the 1940s within schools of art and architecture, and within trade schools and polytechnic colleges associated with vocational training. Until recently, these programs tended to emphasize original creativity and processes of trial and error characteristic of arts and crafts traditions rather than the research, methodological reflection, and publication central to most contemporary professions. Over the past two decades, however, many of these programs at research universities have substantially increased the amount of formal instruction and systematic training required of their students. They have significantly extended their scope to establish interdisciplinary connections with a wide range of academic disciplines, and they have

begun to hold their faculty to scholarly standards of research and publication equivalent to those of other scholarly and scientific disciplines.

This evolution of design into a more formal academic discipline is most evident in the emergence over the past ten years of a small but growing number of doctoral programs in design in the U.S. and around the world. Its impact can also be seen in the expansion of other large graduate programs in the field, including those at the University of Minnesota, Ohio State University, North Carolina State University, Carnegie Mellon University, Georgia Institute of Technology, the Institute of Design at the Illinois Institute of Technology, the Graduate School of Design at Harvard, the Product Design Program at Stanford, and the MIT Media Lab, which is doubling its facilities in Cambridge and has established a "Media Lab Europe" in Dublin with a $10 million grant from the Irish government. The international expansion of academic design programs has been especially dramatic, with large schools of design being started recently at major universities in Barcelona and Milan, and older programs flourishing in the United Kingdom, Finland, Sweden, Norway, Australia, New Zealand, Turkey, Taiwan, Japan, and Korea—to name only those countries represented at the most recent international conferences on doctoral education in design.

The School of Design described in this proposal is unprecedented in its combination of attributes:

- Emphasis on a research-based, interdisciplinary approach to design at all levels, from the first-year courses to the doctoral program. Methods of instruction will include large lectures and small seminars, with extensive studio work and an emphasis on teamwork in design projects. The curriculum will stress fundamental intellectual principles of design and design processes, with close attention to the aesthetic, cultural, historical and philosophical issues associated with design. It will also equip students with a firm grounding in the tools, technical skills, and knowledge of materials and media necessary to achieve the designers' specific objectives.
- A comprehensive array of degree programs at the bachelor's, master's, and doctoral levels, including the B.A. and B.S., the M.A. and M.S., and the Ph.D.
- An internal structure that allows for flexibility in terms of faculty interests and instructional programs but that focuses on four specializations that correspond to separate tracks and degrees at the undergraduate level:
  1. design studies (B.A.);
  2. interaction design (B.S.);
  3. product design (B.S.);
  4. spatial design (B.A.).

  All students will be required to have some work in each of these tracks. For students with more specific and traditional professional objectives, courses from the tracks could be combined to create an interdisciplinary focus on a particular application, such as vehicle design, and/or to provide the basis for graduate study in a related field, such as architecture.

  The following graduate degrees will be offered:

1. M.A. in design, available for students who wish to pursue graduate work in the field but lack an undergraduate degree in design or a related field. The M.A. can be a terminal degree, or it can be used to support application to the Ph.D. program.
2. M.S. in design, offered through specialized programs in the following areas: interaction design; vehicle design; product design; spatial design; universal design; and, ideally in conjunction with the M.B.A. in the Graduate School of Management, design management.
3. Ph.D. in design.

- A scale of enrollments and faculty FTE capable of supporting this structure and responding to projected interest in such programs and the market for their graduates:
  1. Approximately 800 students, divided roughly into 625 undergraduates, 135 master's students, and 40 doctoral students.
  2. A total of 40 faculty FTE, including joint appointments split with other units on campus and several lines reserved for part-time adjunct professors and lecturers drawn from leading design firms and schools throughout the world.
- The administrative independence of a school coupled with formal mechanisms to facilitate the sharing of faculty and students with other units on campus.
- A large exchange program for faculty and students, integrated into the students' curriculum and the faculty's appointments and based on an international consortium of design schools.
- The opportunity to serve as host institution for The Design Academy, an organization of accomplished designers and corporate leaders now being formed to serve as a liaison between corporate and academic design programs worldwide.

The School of Design described in this proposal presents UC Irvine with a rare opportunity to assume a position of intellectual and institutional leadership on a global scale. The field of design is presently undergoing a profound transformation that is changing what designers do and how they think about their work. To this point, however, that transformation lacks the conceptual coherence and intellectual vision that can only be developed through scientific research and scholarly inquiry. There is no question that over the next decade a science of design and a new academic discipline will emerge from the diverse professional practices and various programs that exist today. What remains to be decided is whether that will happen at UC Irvine or somewhere else.

Vision

DESIGN TODAY

Design is pervasive in human endeavors. Our landscapes are shaped by designers, as are the structures built on that land. We find our way around those designed spaces using graphical designs in maps; we design the systems by which we interact in, and with, those spaces. We fill those spaces inside and out with an endless array of designed objects: bridges, buildings, furniture, circuits, dams, cell phone towers, toasters, airplane seats, and almost everything else that we touch and use in our everyday lives. Technological advances present unprecedented opportunity for design of micro-scale devices, space-based sensing arrays, or "smart fabrics" that change the way we move through and experience the environment around us. Even the physical sites of design have changed rapidly in the past decade and will continue to evolve even more quickly, from present modes of virtual reality and architecture to the future realms of articulated buildings, tactile interface technology, virtual sculpture, and robotic surgery inside the human body.

We are constantly looking to design for more efficiency, individual customization, cultural sensitivity, "style," efficacy, environmental sensitivity and friendliness, and novelty. In response, design has expanded to encompass environmental issues, the rapid evolution of materials, and a shifting scale of problems ranging from planetary networks to world-wide systems to air-traffic control systems to buildings, cars, PalmPilots, and MEMS devices. This broader scope for design has, in turn, forged new connections among disciplines that previously developed in isolation, created new languages that cross older disciplinary boundaries and transform the infrastructure of design, and realized an array of objects and fields of study that we could only dream about in the past.

A wide range of factors have combined recently to elevate the importance of design in manufacturing and engineering, management and marketing, as well as

public policy, and to increase the general public awareness of design as a profession and an influence in our daily lives. For example, design has come to play a much larger role in the strategic planning of corporations in general, especially regarding plans for innovation and development of new products in an international setting, and designers now often hold senior-level management positions in major corporations. Design now not only must encompass the issues, technologies, and agents involved in creating and using artifacts, processes, and built spaces; it must also address philosophical principles and political objectives, and it must convey our collective sense of history, aesthetics, and cultural diversity.

This expanded role for design has resulted in explosive growth among professional design firms and the corporate sectors associated with design around the world. In a recent cover story on "The Rebirth of Design," *Time* magazine declared design to be one of the fifteen hottest professions of our time in terms of job growth, salaries, and other financial compensations (Gibney and Luscombe 2000). The U.S. Bureau of Labor Statistics projected an 11.5% growth rate nationwide for the profession of design between 1997-2005, and between now and 2010 they project a growth of about 20% nationally (United States Department of Labor 2001). Similar growth is predicted for the United Kingdom by Britain's Design Council. The top 100 design firms there reported increases of 20% in both the number of full-time staff and the amount of fee income from 1998 to 1999 (the last year for which systematic data is available). There are 255 programs in design in the U.K., enrolling 15,000 students, a 24% increase in the past four years. Design courses offered through extension programs have seen a 62% increase in enrollments since 1994-95. (For more on the growth of design, see "Demand" on page 38)

With this growth and expanded scope for design, however, have come new demands on designers. As a society we now expect more of the designers who produce these artifacts, objects, and processes than we have required in the past.

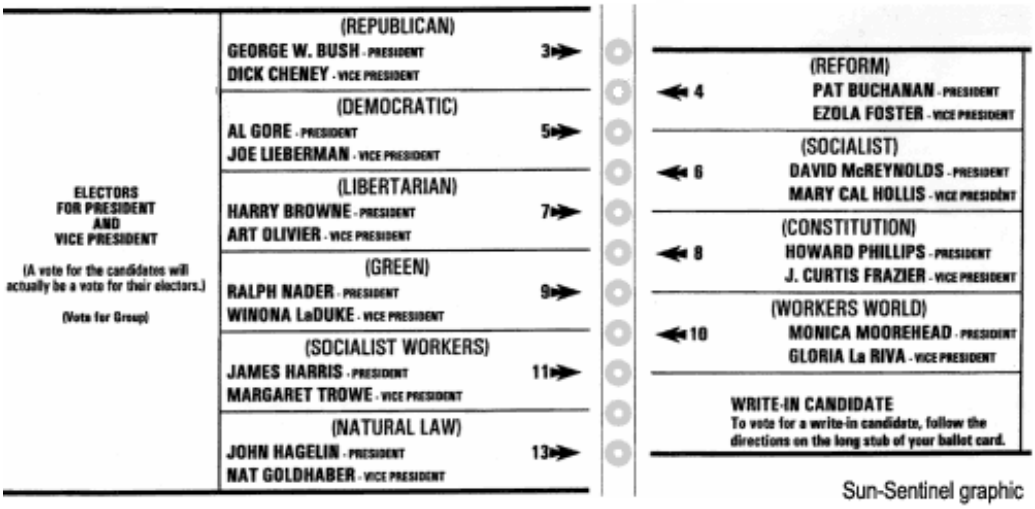
To be effective, designers can no longer focus simply on the narrow domains of specific applications. They must increasingly reach deeper and more broadly into the foundations of design, and they must understand more about the cultural contexts in which their designs are created and used. They are now called upon not only to produce new products but also to manage the processes by which the products are produced. They must also understand more about the ways products are used and the people who use them, about how to involve users in a design process, and about how to evaluate designs based upon usage.

The constraints represented by human factors are particularly important, as most designed artifacts are intended for human use. Designers must be aware of the range of physical abilities, and, increasingly, of how people age, and they must understand the consequences of those changes for designed artifacts. Designers must be aware of the cultural contexts in which products are used, including such obvious issues as variations in languages and alphabets, the symbolic connotations of different colors in different societies, and more profound issues of moral values and religious differences.

In addition, more than ever before, designers are required to investigate and articulate the principles and methodology behind the designs through systematic research, experimentation, intellectual inquiry, and theoretical speculation. They are also expected to communicate their findings and contribute to a body of knowledge that constitutes the basis for an emerging academic discipline and a true science of design.

The need for an interdisciplinary approach to design: the voting booth example

A timely and poignant illustration of the need for an interdisciplinary approach to design can be seen in the once lowly and neglected voting booth and the associated ballots, voting equipment, counting procedures, and governing laws and practices. The tortuous experience in Florida in November 2000 revealed the powerful and subtle aspects of and relationships between information design (how candidates were presented on ballots, such as the "butterfly ballot" shown here), mechanical design (consistency and accuracy in punching holes), business processes (including the mundane task of emptying chads from the ballot machines' bins), and the perception of voting practices and policies by different racial and ethnic groups.



Sun-Sentinel graphic

The National Science Foundation sponsored a workshop on the use of the Internet for voting, and included in the discussion were state election officials, social scientists, computer scientists, and Internet security experts (Internet Policy Institute 2001). Mathematicians such as UC Irvine's Donald Saari have written on the deep and surprising aspects of voting practices (Saari 2001). One thing is clear: whatever improvement to the nation's practices is achieved will result from the coordinated contributions of specialists from many diverse disciplines in the *design* of new policies, practices, and technology.

TOWARD A DISCIPLINE OF DESIGN

Today's new designers require a new kind of training that goes beyond the traditional apprenticeship and practice-based programs associated with many academic design programs today. In the past, designers were trained largely by a system of apprenticeship, and design projects conducted through processes of trial and error characteristic of the arts and craft tradition from which design emerged

as a trade. As a corollary to these practices, creativity and originality were celebrated as primary attributes of the designer. Systematic research, theoretical reflection on the design process, methodological analysis, and even the production of a written archive were considered as unimportant or even threatening to the freedom and individuality of the designer. This attitude persists today among some designers and at some levels in the corporations that hire them. It has also been reinforced by most academic design programs in the U.S. ever since the 1940s, when design entered university curricula through programs of art, still a common home for design programs in many institutions (Friedman 2000a). At the same time, the training of designers has often been associated with purely technical skills and taught in polytechnic universities or vocational schools, as is customary in the United Kingdom and many Asian and European countries as well as the U.S. In either case of arts or vocation, research has not been central to the mission of the program or the institution, and the association of design with such guild-oriented training has led many academics, scientists, and engineers to dismiss design as an intellectually superficial field unworthy of formal study.

Over the past two decades, however, designers have increasingly come to rely on research and theory to provide a foundation for more efficient, effective, and innovative design. As Ken Friedman has put it,

> The challenge of any evolving field is to bring tacit knowledge into articulate focus. This creates the ground of shared understanding that builds the field. The continual and conscious struggle for articulation is what distinguishes the work of a research field from the practical work of a profession (Friedman 2000a).

From this perspective, design is at a point that recalls the professionalization of medicine and law in the nineteenth century, when these fields were organized and regulated by professional organizations that stressed more systematic training in the conceptual foundations of practice and the direct oversight of educational programs through accreditation and review. The shift also reflects the more recent transformation of engineering from vocational practice to applied science, as suggested in 1930 by the President of MIT, Karl Taylor Compton, who in his inaugural address said that he had studied the curriculum at MIT "to see where training in details has been unduly emphasized at the expense of the more powerful training in all-embracing fundamental principles" (quoted in Simon 1981 and discussed by Friedman 1997). These parallels have led some scholars to describe current changes in the field of design as leading toward a "design science" based on practices characteristic of scientific and scholarly disciplines, including:

- methodological self-reflection;
- the explicit articulation of theoretical principles guiding the design process;
- the development of a published body of knowledge that can serve as the basis for future hypotheses; and
- a culture of research that values critical inquiry and the solution of generalized problems beyond those associated with a specific project (Friedman 1997). (Nigel Cross [2000] provides a brief history of this interest in design science and methodology, starting with the design methods movement of the 1960s that culminated in Herbert Simon's now canonical *The Sciences of the Artificial* [1969]. Simon called for universities to establish a "science of design": "a

> body of intellectually tough, analytic, partly formalizable, partly empirical, teachable doctrine about the design process" [p. 58].)

The issue of science and methodology in design has also been a prominent theme for conferences over the past two decades, beginning with the meeting of the Design Research Society in 1980 on "Design:Science:Method" and continuing through "Doctoral Education in Design" at Ohio State University in 1998, "Design Thinking Research Symposium" at MIT in 1999, and "Foundations for the Future" at La Clusaz, France in 2000. It has also been the subject of numerous books and articles from many countries, including Nigel Cross's *Developments in Design Methodology* (1984), *Design Methodology and Relationships with Science* (de Vries, Cross, and Grant 1993), *Konstruktionswissenshaft* (Hansen 1974), and many others.

Development of this research culture in design will require designers to have more extensive academic training that approaches design not only as a specific problem to be solved but also as a field of inquiry, scholarship, and critical debate. That training will focus less on the dramatically diverse products of design and more on the processes of design leading to their production. These processes have many common elements that can be the focus of research and a coherent educational program, such as the issues, techniques, and agents involved in creating and evolving artifacts, processes, and institutions, and the strategies for satisfying constraints on these objects that are imposed by their purpose, their users, and their environment. The major intellectual elements of design include methodological principles and aesthetics, techniques and methods, tools, history, and various kinds of physical and social constraints, and each of these topics offers rich opportunities for research, experimentation, and theoretical speculation in an academic setting.

Design in this broader sense—the task of joining function, form, methodology, and context—involves major intellectual issues that demand serious academic study and the kind of professional training and undergraduate education that can only be accomplished with the resources of a large research university.

The intellectual roots of design extend into the arts, humanities, sciences, and engineering, and all of these disciplines contribute to the theory and practice of design. The combination of these perspectives at a university provides new understandings, enables much more effective design practice, and opens doors to new lines of intellectual inquiry. For example, management offers designers insights into markets, marketing, production practices, and cost/value insights. The physical and biological sciences pose new challenges for designers in understanding massive quantities of data, and in the creation of novel instruments. The social sciences offer insights from cognition, perception, psychology, anthropology, and sociology that may be applied to the design of everything from automobile dashboards to social services and public policy. Engineering provides innovative enabling technologies that designers then implement and apply to challenging problems found in everything from space stations to communication systems. The humanities provide historical and critical perspectives on design, multicultural understanding of aesthetic and philosophical issues, and a sophisticated grasp of issues in the communication and dissemination of new ideas and products. The

arts guide design to aesthetic issues through the development of new forms of expression and communication based on performance, the design of new artistic objects, lighting, aural and theatrical space, and digital media. Medicine expands the scope of design even further into objects and issues vital to our health and well-being, and it offers an integrated perspective on a host of challenges in the areas of science, technology, social understandings, public policy, and health-care management.

CURRENT PROGRAMS IN DESIGN

No current program or school of design covers this broad range of topics, approaches, and objectives, nor is there a "typical" organization or focus for education in design. There are about three hundred academic schools, institutes, and programs of design worldwide, and they are configured very differently. (See "Appendix H: Survey of Design-Related Programs at Other Institutions" on page 115 for a survey of the major programs.) Most generally, academic design may be divided into schools or programs that focus either on architecture or on one or more aspects of "design" associated with something other than built space, such as industrial design and product design. (Given Simon's characterization of the sciences of design, however, these examples might also include aspects of programs in information technology, information science, computer science, or information studies.) In terms of professional schools and programs, "design" usually means industrial design or what might be generally called graphic arts, a vague term covering a wide range of activities including website design, digital arts, computer gaming, and media and entertainment systems. Most respected professional schools and programs in either of these two general categories are affiliated with universities, though there are notable exceptions, the Art Center College of Design in Pasadena being perhaps the best-known example of an independent school of design in California.

Each of these broad categories has its own licensing and accrediting standards, and hence its own academic and professional identity. Architectural schools and programs are licensed by the National Architectural Accrediting Board (NAAB) and have carefully regulated curricular requirements. Most licensing boards in the U.S. require applicants for licensure to have graduated from a NAAB-accredited program. There are currently 110 schools in the U.S. offering NAAB-accredited professional programs in architecture leading to the M.Arch. or B.Arch. degree. Schools of architecture often also include programs in landscape architecture (with voluntary accreditation by the American Society of Landscape Architects) and interior design (accredited by the Foundation for Interior Design Education and Research), and/or urban planning (accredited by the Planning Accreditation Board).

Industrial design is usually offered as a major program in schools of design, or sometimes in schools of architecture. Programs in industrial design may be accredited by the National Association of Schools of Art and Design (NASAD), though standards are less specific than those for architecture and consequently there is more variety in these schools and programs. In addition, graduation from an accredited program in industrial design is not required for practice in this field. There are 33 NASAD-accredited programs in industrial design in the U.S., and 20 non-accredited programs in the field recognized by the Industrial Designers Soci-

ety of America (IDSA). Industrial design is a popular program around the world as well. Industrial design is usually offered through or in conjunction with schools of engineering. The MIT Media Lab is the largest and best-known of these programs in the U.S., but Stanford University also has a very successful program in product design that started in 1958. The Royal College of Art in London has a joint degree program with Imperial College; Delft University in Holland offers a program in industrial design engineering; and the Politecnico di Milano, the premier engineering university in Italy, has recently started a school of design that already has a highly respected Ph.D. program.

The institutional division of design into these two broad categories testifies to the pervasive influence of a guild-based approach to design as a trade rather than a field of academic study. A quick survey of some of the largest and best-known design programs in the U.S. further demonstrates the extent to which academic design continues to reflect this traditional attitude toward the field and the vagaries of local institutional cultures from which these programs emerged decades ago.

- The Art Center College of Design offers a B.F.A. in advertising, film, fine art, graphic design, illustration, and photography. A B.S. is offered in environmental design, product design, and transportation design. A M.F.A. is offered in film, fine art, and communication and new media design (which includes graphic design and digital design). A M.S. is offered in industrial design. A M.A. is offered in art theory and criticism.
- The Harvard Graduate School of Design offers degrees in architecture, landscape architecture, urban planning, and design studies, which includes seven different areas of study, including "digital media and production environments," "design and the environment," "history and theory [of design]," etc.
- The Center for Creative Studies College of Art and Design (Detroit) includes departments of crafts, fine arts, communication design, industrial design, photography, animation and digital media, and has a major thrust in automotive design.
- The MIT Media Lab, part of the MIT School of Architecture and Planning, offers a program in "media arts and sciences" that includes the following research areas: "news in the future" (information technology), spatial imaging, object-based media, "micro-media" (micro-electro-mechanical systems), "opera of the future," "aesthetics and computation," etc.
- The School of Design at Carnegie Mellon University offers the B.F.A. in communication design and industrial design, a M.Des. in interaction design and in communication planning and information design, and a Ph.D. in design theory, interaction design, typography and information design, and new product development.

DESIGN IN CALIFORNIA

However effective these separate programs may be, and regardless of the brilliance of their faculty and students, the broad range and heterogeneity of programs fragment the fundamental themes and issues of design into separate units and thereby make a comprehensive, coherent approach to design almost impossible to imagine in these present institutional contexts. The education, curriculum, and structure of existing design schools are functions of history. Whether they go

back two centuries or two decades, the shape they took was determined by the formal and conceptual circumstances under which they developed. In contrast, the UC Irvine School of Design will be one of the few design schools developed as the result of a conscious plan, the first such school built as a new school within a major research university rather than developed or merged from existing programs. As such, the UC Irvine School of Design will offer the integrated, research-based education that only a major university can provide, and it will offer a comprehensive, coherent approach to design that can only result from conscious planning.

Current schools and programs of design in California reflect varied origins, with the following major categories. (See also "Appendix H: Survey of Design-Related Programs at Other Institutions" on page 115.)

The Industrial Designers Society of America (IDSA) lists nine programs of industrial design in California, six of which are formally accredited. According to the IDSA, there are no programs of industrial design in the UC system. Among research universities in the state, only Stanford has a program (in product design) recognized by the IDSA (but not accredited by NASAD), and that program reports heavy demand from students and excellent placement of graduates. There are two programs in industrial design in the CSU system (CSULB and CSUN), and the rest are at smaller independent universities and colleges.

Design is also often taught as part of the curriculum in schools of architecture. California has nine accredited programs in architecture recognized by the National Architectural Accrediting Board (NAAB). Two are at UC campuses: UCLA and UCB. In addition, USC has a school of architecture, and the rest are at smaller colleges and universities or stand alone as independent institutes.

Design is also taught as environmental design in landscape architecture programs. There are four such programs in California according to the American Society of Landscape Architects (ASLA), including two in the UC system: UCB and UCD. The others are at California Polytechnic State University (San Luis Obispo) and California State Polytechnic University (Pomona). UC Davis and UC Berkeley are currently considering a joint-Ph.D. program in landscape architecture (as announced in their Five-Year Plans).

A fourth relevant category is interior design, and there are fifteen programs in California accredited by the Foundation for Interior Design Education and Research (FIDER). None of these programs are on a UC campus except through extension programs at UCB and UCLA; UCD has an unaccredited program in interior design offered through the Department of Design. Two CSU campuses have programs in this field (CSU-Sacramento and CSUN), and the rest are at smaller colleges and universities or stand alone as independent centers or institutes.

Design management is not taught as an independent program as often in California as it is elsewhere, especially in European schools of design. Cal State Pomona offers perhaps the best known program in design management through its busi-

ness school, and with the support of substantial federal funding they have achieved significant international visibility in this growing field.

SIGNS OF CHANGE

As these examples suggest, there is no institutional model or disciplinary paradigm in the field of design that might provide a coherent and consistent structure to house the increasingly multi-disciplinary dimension of design practice.

No present school or program captures the fundamental transformations now shaping the future of design. Rather, most academic design programs are organized in a way that reflects traditional objectives and industrial practices in the field of design as they have taken shape over the past fifty years. However, the development of design as a profession and academic discipline has already begun to affect the teaching of design in some programs. Despite the obstacles of institutional inertia and outdated programmatic structures, over the past two decades some programs in design at research universities have substantially increased the amount of formal instruction and systematic training required of their students. They have also significantly extended their scope to establish interdisciplinary connections with a wide range of other academic units, and they have begun to hold their faculty to scholarly standards of research and publication equivalent to those of other scholarly and scientific fields.

The result has been rapid growth in the status and visibility of these progressive programs, with burgeoning enrollments in schools of design around the world (see "Demand" on page 38 and "Appendix H: Survey of Design-Related Programs at Other Institutions" on page 115). Programs in California are no exception, regardless of the kind of institution in which they are housed.

The Art Center College of Design in Pasadena, for example, enrolls about 700 students (and rejects 35% of the applications it receives). The College of Environmental Design at UC Berkeley, with its Department of Architecture (which includes a substantial component of design courses), has about 635 undergraduates and over 300 graduate students, many of whom go on to careers in design rather than architecture in a traditional sense. In response to demand and the prospects of future development, UC Berkeley has also just started the Berkeley Institute of Design (BID) in its Center for Information Technology Research in the Interest of Society (CITRIS). Enrollment growth in design is equally impressive elsewhere in the U.S., especially at the graduate level. At the Illinois Institute of Technology, which started the first Ph.D. program in design in the U.S. ten years ago, the Institute of Design recently had to suspend its undergraduate program in design just to keep up with enrollment growth in its graduate design programs and effectively utilize the nine-fold growth in its endowment.

The MIT Media Lab, perhaps the most prominent research-oriented design program in the world, gets several thousand applications every year for the two hundred openings in its graduate programs, which are supported by a $35 million budget, 90% of which comes from its corporate sponsors. Media Lab is presently doubling its facilities in Cambridge and has established a "Media Lab Europe" in Dublin with a $10 million grant from the Irish government.

The international expansion of academic design programs has been especially dramatic. About 1,000 students apply every year to the schools of design in New Zealand, and the Politecnico di Milano admits 600 new students each year to the school of design it started five years ago. Large schools of design have been started recently at major universities in Barcelona and Milan, and older programs are flourishing in the United Kingdom, Finland, Sweden, Norway, Australia, New Zealand, Turkey, Taiwan, Japan, and Korea—to name only those countries represented at the most recent international conference on doctoral education in design.

AN OPPORTUNITY FOR DISTINCTION AND LEADERSHIP

These changes in the way design is being practiced and taught around the world present UC Irvine with a rare opportunity to assume a position of intellectual and institutional leadership in this field. The School of Design described in the proposal will allow UC Irvine to seize that opportunity with a coherent, comprehensive, interdisciplinary approach to design organized in four areas of specialization that will provide foci for faculty research and curricula for its educational programs. These specializations reflect emerging emphases in the field of design that cut across more conventional professional boundaries and institutional divisions, and they will prepare students for a wide range of long and productive careers. The specializations are:

- interaction design: interactions between humans, the machines and products they build, and the technological and informational systems that support their use;
- product design: theories and methods underlying the conceptualization and creation of new products, including principles for innovation, decision analysis, and team management; the integration of emergent technologies and new materials; marketing and business strategy; and cultural issues associated with the production and use of new products;
- spatial design: development and organization of space and environment, ranging from small interiors of vehicles or houses to larger exterior spaces, and including the technological enhancement of physical space such as virtual reality, lighting, or auditory imaging; and
- design studies: inquiry into a general theory or science of design based on research and scholarship in current practice and methods, and in the history and philosophy of design and related fields.

The general objectives of the School of Design at UC Irvine will be to advance the techniques of design, to train students in the technical and aesthetic dimensions of the field, and to investigate the deep intellectual and cultural issues associated with the contemporary roles of design in our world today. Instruction will include undergraduate and graduate degrees, with a significant component of professional master's degrees and a special emphasis on doctoral research. (For a detailed account of the curricula and degree-programs, see "Structure and Size of the School" on page 17.) In addition, through cooperation with an international consortium of top design schools around the world, the School of Design at UC Irvine will strongly encourage an international perspective on design through exchange programs for faculty and students at universities around the world.

In addition to providing an additional option for undergraduate study and expanding our graduate enrollments significantly, the School of Design will help focus the interests of faculty and students now distributed in several units across campus, and it will enhance the scope and visibility of scholarship and research at UC Irvine. It will also significantly extend our capacity to attract funding from private and government agencies, and it will multiply possibilities for other productive interactions between UC Irvine and business and industry on a global basis. This latter point is especially significant for Orange County and the City of Irvine in particular, which is home to the design firms for Mazda and Ford's Premier Automotive Group of high-end automobiles; for Oakley, one of the most influential designers of sports clothing and accessories in the U.S.; and for an extraordinarily broad array of international business and high-tech industry. A large comprehensive school of design at UC Irvine will encourage further development of this large and dynamic sector of the economy, and it will make UC Irvine the center and driving force of that expansion in our region.

CHARGE AND PROCESS

With the goal of examining whether a school of design is feasible and appropriate, former Executive Vice Chancellor William Lillyman appointed an Ad Hoc Committee in Fall 2000. This committee produced a report on December 11, 2000, in which it recommended that:

> UCI develop a proposal to create a school of design to foster inquiry into the nature of design and the design process. Its objective would be to advance the techniques of design, to train students in the technical and aesthetic dimensions of design at both the undergraduate and professional levels, and to investigate the deep intellectual and cultural issues associated with design in a rapidly changing world (UC Irvine Ad Hoc Committee on Design 2000, p. 1).

On approval of this recommendation by Executive Vice Chancellor Michael Gottfredson, the Ad Hoc Committee (with a few changes in membership) proceeded to develop a proposal for establishing a school of design at UC Irvine.

In developing these proposals, the committee gathered extensive data on existing design programs in the U.S., in Europe, and elsewhere (see Appendices F, G, and H). The committee examined data on employability of graduates. Additionally, the committee talked with and sought the advice of many designers from academia and industry, both national and international. A list of individuals consulted by the committee may be found in Appendix B.

On June 12, 2001, a campus-wide Town Hall meeting was convened to solicit early feedback and suggestions.

In spring 2002, a draft of the proposal was sent to extramural consultants for review and comment. It was also circulated among interested faculty on campus to explore possible interactions between the proposed school of design and present units, programs, and faculty at UC Irvine.

Based on findings from this research, the committee is proposing an innovative and forward-looking school of design meant to capitalize on present develop-

ments in the field and address the needs and problems of the coming decades, all the while learning from the past.

Structure and Size of the School

The breadth and complexity of design as a field of study, coupled with the explosive growth of research agendas and of professional applications in academia and in business, argue for a School of Design at UC Irvine that is administratively independent and focused on a few key areas of study, but that is also open to interdisciplinary collaborations with a wide range of present units on our campus.

The School of Design at UC Irvine will have its own faculty, dean, and staff. This administrative independence is essential if UC Irvine is to assume the position of institutional leadership in the field of design that is within our grasp. Schoolhood will accommodate the development of tracks, emphases, and eventually separate departments in the areas of design described in this proposal. It will facilitate the development of comprehensive curricula in design at all levels from undergraduate majors to the doctoral program, and it will support large enrollments at the undergraduate level and at the master's level in professional programs. Schoolhood will also establish an institutional focus and extramural visibility crucial for recruiting students and faculty in design, and for attracting corporations and other organizations that will be substantial sources of funding for those faculty and students.

The School of Design at UC Irvine will offer a full range of undergraduate and graduate degrees. At the undergraduate level, two degrees will be offered, the B.S. and the B.A., which will be associated with the specific tracks described below. The B.S. will emphasize the science and technology of design. The B.A. will focus on the aesthetic, cultural, and historical aspects of design, with a strong emphasis on critical analysis and verbal articulation of principles, theory, and values. Both bachelor's degrees will equip students with a deep understanding of design that will prepare them to pursue a wide range of careers on graduation, and/or to con-

tinue their education in graduate programs in such areas as urban planning, information systems design, architecture, industrial design, automotive design, and business administration.

At the master's level there will also be two degrees: M.S. and M.A. The M.S. will be a "professional" master's degree intended for students with a background in design or a closely related field. This M.S. program will focus on enhancing capabilities in targeted areas. The M.A. program will be more general and interdisciplinary and will be intended for a wider range of students, including those who may wish to continue on to the Ph.D. in design.

At the doctoral level, a Ph.D. in design will be offered by the school from the beginning and will be an essential part of its research mission. Although the Ph.D. in design is still a relatively new degree, as explained below it is quickly becoming the preferred academic credential for faculty in design. Furthermore, the growing importance of research and methodological innovation in the practice of design indicate an increasing interest in doctoral training by corporations and design forms around the world.

A summary of these degrees and tracks appears in Table 1.

TABLE 1. Summary of specializations and degrees

Specialization	B.A.	B.S.	M.A.	M.S.	Ph.D.
Design			✔		✔
Design Management			✔	✔	
Design Studies	✔				
Interaction Design		✔		✔	
Product Design		✔		✔	
Spatial Design	✔	✔		✔	
Universal Design				✔	
Vehicle Design				✔	

Specializations

The School of Design at UC Irvine will draw from the many disciplinary backgrounds described in the introduction, some of which are traditionally associated with design and others that are not. This interdisciplinary base reflects the emerging intellectual and professional paradigm in design, and it aims at nothing less than synthesizing a new discipline. It also argues against the establishment of separate departments, at least for the first several years of the school's existence. Instead, the school will be organized according to four primary specializations that reflect the research interests of the faculty and prevailing foci in the field.

DESIGN STUDIES

Design studies focuses on the historical and theoretical dimensions of design as a topic of scholarly research, analysis, and critique. Research and curricula in this area will cover various themes and topics in the history of design; major designers and schools; the ethics and ecology of design; cultural issues associated with the design of products and their uses; and other theoretical and aesthetic topics. In many ways the most traditional of the four specializations proposed here, design studies will provide the conceptual and philosophical foundation for research and teaching in the School of Design, with emphases not only on scholarship and publication, but also on the written, oral, and visual articulation of design principles and methodologies in the practice of design and team management.

INTERACTION DESIGN

Historically, approaches to design have primarily focused on single artifacts and one's interaction with them. In the daily experience of dealing with dozens or hundreds of objects and pursuing multiple objectives, however, our satisfaction or success is increasingly determined by how well an ensemble of objects, policies, and practices function. Many design failures and unpleasant experiences may be traced to awkward and complex interactions between multiple artifacts and/or multiple individuals. Charles Perrow (1999) has, for example, highlighted this in his research, as have Donald Norman (1989, 1993) and Henry Petroski (1992, 1994).

The specialization in interaction design, therefore, is non-traditional, reflecting the increasing importance and prevalence of interactions in daily life, whether between humans, between humans and machines, or between machines, as well as the complexities and difficulties of designing such interactions.

To illustrate, driving a car is a good example of an "interaction experience." The driver must be able to assess the state and behavior of the car, assess the driving situation around the car, and via traffic laws, signs, and controls interact with drivers of other vehicles and the environment. Industrial process control provides another example. In the control room of a powerplant, for instance, the operators must be able to effectively determine the state of the equipment under their control, determine what changes to make, and then effect those changes through the use of various equipment. Successful and safe operation may depend critically on the ability for multiple workers to coordinate their activities within the control room, coordinate their activities with external agents (other power suppliers, customers, or regulators), and correctly operate the equipment. A global perspective on this interaction may reveal problems in, e.g., conflicting units of measurement, inconsistent controls (does clockwise motion imply "more"?), unclear responsibilities, barriers to communication or teamwork, or inefficient processes.

Regardless of the particular application, the underlying principles and processes of interaction design are shared. Doing such design well requires understanding of the broad task, human physical limits, cultural norms, and so on. Interaction design, therefore, is the study of principles, techniques, tools, and processes for designing (1) interactions and (2) entities with which and through which people interact. As such, it includes and goes beyond the more traditional notion of interface design and human-computer interaction (HCI), and draws from work in human factors, ergonomics, communications, cognitive science, software engi-

neering, cultural issues, and more. (Accordingly, faculty working in this specialization would likely have close ties with other units on campus, such as Information and Computer Science and Social Sciences.)

Among the research issues associated with interaction design are questions of representation of interactions and their use in reasoning about designs. Since interactions are fundamentally abstract entities, having no "ground truth" form, creation of effective representations is a key challenge. Interaction design includes concerns with human-machine interaction, information display and visual explanations, and group coordination support. Students must have training in human factors, have a broad understanding of the effect and role of cultural norms in governing interactions, and more.

Interaction Design

Some social scientists, architects, and urban planners are rethinking the notion of a "Town Hall," providing another example in which interaction design is important. Once just conceived as a building where local government functioned, town halls in this century will be complex and distributed, yet seeking to deliver more services at lower cost, with greater speed, and with less hassle. The means by which citizens will determine what zoning regulations apply to a property, how they can file for a variance, assess where their variance request is in the approval process, how a ruling may be appealed, and so on must be supported by procedures, information displays, buildings, and networks that also support the myriad of other town hall services. Will all interactions take place through web sites? How will drawings be submitted? How will voting take place? Similarly, the future Town Hall must support an unprecedented degree of communication within the community. What forms will this take? The potential for the improvement of services is very great, but the complexity and difficulty of getting the design "right" demands a clear focus on the *interactions* between the various individuals, institutions, structures, and equipment—for that is what will determine any individual's satisfaction with the design.

Several programs in interaction design are offered world-wide. Most are narrower in conception than our proposal, focusing only on design of systems in which computers dominate. While this is certainly well within our conception of interaction design, we think the issues, principles, and approaches are broader and should be considered in a broader context.

Carnegie Mellon University's School of Design offers a Master of Design in Interaction Design (Carnegie Mellon University 2001), but the scope of the program is much narrower than proposed here. Specifically, CMU's program centers on human-computer interface design and human-machine interaction design.

A broader perspective is taken by the new Interaction Design Institute in Ivrea, Italy (Interaction Design Institute 2001). Their perspective is that "Interaction design is a new discipline: a fusion of aesthetics and culture, technology and the human sciences. It concerns the design both of the services these technologies might offer, and the quality of our experience of interacting with them.… Interaction design also reveals the new business models that are needed to deliver these services and experiences." Their objectives are to "develop sophisticated strategies of cultural research and development; to redefine and merge the scientific and humanistic knowledge that defines industrial culture today; to construct new

areas of knowledge and expertise; and to educate people to be flexible and inventive so that they can seize the opportunities these new technologies offer for cultural, social and economic life."

A variety of other programs exist elsewhere in Europe. At Brunel University's Runnymede Campus in Egham, Great Britain, the Department of Design houses the Interaction Research Program (Brunel University 2001), whose "projects focus on activities such as conceptual design with emphasis on industrial designers using computer aided design software, as well as studying interaction design techniques and methodologies for the design of electronic products. Humanoid modelling of the mechanical interaction between people and products and the application of multimedia techniques within the design process are also an integral part of the research within our group." In Sweden, interaction design is the name of a number of courses given in the cognitive science program at Linköpings universitet (Linköpings universitet 2001). "The aim of the courses is for the students to work with the design of interactive IT-artifacts. This does not only concern multimedia and web applications, but can also be accounting systems, computer-based training, or future systems for control of IT-products in our homes." Also in Sweden, Umea University's Institute of Design (Umea University 2001) offers a master's program in interactive design, which it defines as aiming "to integrate the physical and cognitive product interface into a successful whole in order to create understandable, usable and enjoyable computer-based products."

Turning to industry, several design firms either actively market themselves as offering interaction design services or seek to hire interaction designers. One of the largest and arguably the most influential product design firms in the world, IDEO, emphasizes interaction design as one of their core capabilities (IDEO 2001). Cooper Interaction Design is seeking to hire interaction designers, whom they define as "curious about the ways people interact with complex informational and technology systems, and know how to make them better" (Cooper Interaction Design 2001). Swim Interaction Design Studio highlights that interaction design "addresses the design of both product behavior and its representation. By product behavior, we mean the interaction architecture, the structure and flow of functionality. Representation refers to the consistent visual language that supports that architecture" (Swim Interaction Design Studio 2001). MetaDesign brings "a systems-thinking approach to the creation of web sites, product interfaces, and even the design of physical spaces" (MetaDesign 2001), a breadth of scope that is consistent with our thinking.

PRODUCT DESIGN

Product design focuses on the process of initiating, specifying, and detailing the configuration of artifacts intended for the benefit of society. Fundamental to this process is the integration of often conflicting demand arising from technical, aesthetic, human, and business requirements. Technical knowledge, insight to human and social needs and creativity are needed meet this challenge and create a successful product. This is often viewed as the activity of the inventor. Graduates of the program are expected to find employment in corporations or consulting firms, or go on to start their own companies.

This track has both traditional and non-traditional aspects. Traditional aspects include a broad focus on analyzing use situations, understanding market factors and business strategies, creating design teams, interacting with manufacturing and engineering groups, and applying classic design principles and techniques. These issues will be addressed through specific design projects organized along more traditional lines, including vehicle design, the focus of a proposed professional master's degree (see "Vehicle Design" on page 41).

On the non-traditional side we foresee an emphasis on designs involving novel materials and applications not usually addressed by the design community. For instance, the use of micro-electromechanical machines opens a door to a wide range of unprecedented applications and design problems, from axles in railcars that can sense flat wheels to picosatellites used in planetary exploration. Similarly "smart fabrics" offer the occasion, for example, to design novel solutions to garments for toxic environments.

Product design is not industrial design. The focus of product design includes the concern for the impact of style, shape and form on appeal to the user; however, it drives further into the consideration of functionality, manufacture, quality and cost. Product design focuses on the product in all of its dimensions and requires a broad technical as well as art education. In contrast, industrial design typically focuses on the skin of a product and therefore emphasizes graphical communication, with aesthetic attention to the smallest details.

A product designer is expected to make a product function effectively, as well as present a comfortable interface, and appealing form. Therefore, the program includes basic courses in materials, mechanics, and manufacturing processes. A product designer must consider issues of sustainability, the relation of the product to the cultures in which it will be found, and must be concerned with human factors and ergonomic insights. Processes for guiding work must encompass marketing, engineering, and business concerns, and must be adapted to meet new challenges and offer improvements to past practice. Furthermore, product design is concerned more with the inventive activity of originating new concepts, rather than restyling old ones; therefore an emphasis on creative problem solving pervades the program. Generating ideas to solve problems is a leadership function, and graduates of this program are expected to advance quickly to leadership roles in either existing corporations or firms of their own. Indeed, formal training in team leadership will be a part of the curriculum.

This program draws inspiration from the product design program in the School of Engineering at Stanford University. There are no other programs like it in the United States. The Art Center College of Design in Pasadena has a department of product design, but the context is not one of a research university offering a liberal undergraduate education. A wide variety of universities in the United Kingdom have programs in product design, such as Bournemouth, Sussex, and the Glasgow School of Art. More broadly, a wide range of schools across Europe have related programs. The Politecnico di Milano, with an enrollment of approximately 4000 students, is the largest international university providing training for product designers and communications and environmental planners. Its product design track is offered in a new school of design.

SPATIAL DESIGN

Spatial design focuses on the design of physical environments at varying scales, from a single room to an entire neighborhood. As the spaces we live in continue to grow in complexity, spatial designers must increasingly incorporate new forms of technology and longstanding environmental and socio-cultural concerns in their designs—and their designs must address these issues as central, rather than peripheral (Association of Collegiate Schools of Architecture 2001). Though akin to architectural design, spatial design is broader, more inclusive, and more closely related to other forms of design that affect people's lives within buildings, including those represented in the other three specializations described here. In addition, spatial design will include the use of new products and technologies in "smart" homes and public spaces, and it will develop progressive methodologies that take into consideration the development of design technologies that will aid the next generation of spatial designers.

The new frame of reference embodied in spatial design will also encompass concerns related to respect of the environment and environmental sustainability, people and social and cultural concerns, and ergonomics, in addition to form, structure, and even excitement through design. Spatial design will thereby have a more holistic and interdisciplinary perspective than is common in the separate disciplines and schools of architecture, urban design, interior design and landscape design. These traditional programs and licensing mechanisms have failed to provide adequate response even though many of the concerns raised, such as accessibility, inclusiveness, sick building syndrome, and design appropriateness, have been around for three to four decades. A new approach is clearly necessary and long overdue.

Spatial Design

Design professionals of the future will work across boundaries of scale and media, using their multidisciplinary education to produce creative design solutions in a range of contexts. Consider, for example, Frank Gehry's recent design for the Experience Music Project in Seattle. The EMP incorporates sophisticated sound and film technology in a setting that is equal parts museum and amusement park (Enlow 2000). The design was achieved through the use of advanced modeling software that was originally intended for the design of fighter jets. The design of this project challenges traditional distinctions between architecture and engineering, and blurs the boundary between the physical and acoustic environments.

WHY NOT ARCHITECTURE?

The planning committee debated the desirability of including architecture as a focus at the graduate level, given the importance of that field in the history of design and the professional opportunities for licensed graduates of accredited programs. As noted earlier in the proposal, there are many schools of architecture in the state already, including programs at UCLA and UC Berkeley, and we could not determine a need in this field that could not be met by those current programs. In addition, a formal accredited program leading to a degree in architecture is such a substantial undertaking in itself that we believe it will inhibit the development of a broader range of activities related to design, especially if it competed with those activities from the beginning.

Courses in architecture may be included in the broader curriculum we imagine, and the tracks described below can be combined to prepare undergraduates to pursue professional degrees in architecture through subsequent graduate study. Furthermore, once the four specializations are well-established in a mature School of Design at UC Irvine, the campus may want to consider adding architecture to the portfolio of professional programs at the master's level.

Degree Programs

These four specializations will guide the recruitment of faculty during the early years of the school, and they will provide students with both a general education in design and a basis for employment and/or further study. At the undergraduate level, the specializations will correspond to four programs of study, or tracks, as described below. Students will take introductory courses in each specialization and then focus on one specialization in the junior and senior years. Courses from each of the tracks could be combined to create an interdisciplinary focus on a particular application such as vehicle design, and/or to provide the basis for graduate study in a related field such as architecture.

At the master's level, these specializations will be further focused on programs of study associated with more specific professional objectives.

Doctoral training will be more individualized and will reflect the research interests of particular students and the faculty with whom they work, though the specializations will undoubtedly be reflected in those interests.

Faculty

The faculty in the School of Design at UC Irvine will consist primarily of two groups: (1) full-time ladder-rank faculty recruited mostly from other schools and programs of design around the world; and (2) adjunct and part-time instructors (lecturers and visiting professors) who are professional designers hired to teach specific courses in their areas of expertise. A third group will be faculty from other units at UC Irvine who offer courses in the School of Design either as cross-listed with their home units or entirely within the School as supported by per-course compensation to their units.

Many schools of design, such as the Art Center College of Design in Pasadena, depend heavily on the second group. At UC Irvine, however, most of the courses will be offered by full-time faculty in the school, who will hold the Ph.D. in design or a related field, or who will have a master's degree, extensive academic experience in an academic program in design, and a strong focus on research and publishing in the field. (This latter option is typical of faculty in design at all universities because the Ph.D. is still a relatively new degree.) Criteria for appointment and advancement of faculty in design will emphasize the importance of

research and publication. Those criteria must also recognize participation in a wider range of activities typical of professional designers, such as with the development and production of products and processes for experimental and commercial application. Consideration of equivalent activities is already customary at UC Irvine in some M.F.A. programs in arts and humanities, and occasionally in medicine, the sciences, and engineering. Nevertheless, the recent emergence of design as a field of academic research requires an especially careful and explicit understanding of the value of such activities in themselves, of their connection to more traditional forms of research and publication, and of their significance in the process of merit and promotion.

International Consortium: The Academic Alliance

The School of Design at UC Irvine has an opportunity to head an international consortium of top design schools around the world that would be convened as the "Academic Alliance" in conjunction with Charles Pelly and The Design Academy (see "The Design Academy" on page 62). This consortium will sponsor exchange programs for faculty and students, international lecture series, and conferences at UC Irvine and other campuses. These activities will be integrated into the research and educational programs of the School of Design from the beginning, providing a global perspective on design and significant recruiting incentives for faculty and graduate students who wish to study abroad on a regular basis. In response to our letter soliciting expressions of interest in this consortium, we have received positive responses from leading schools in India, Hong Kong, New Zealand, Finland, Australia, Korea, and the Netherlands. The letters are included in "Appendix I: Supporting Letters" on page 129.

Size

The School of Design at UC Irvine will have 40 faculty and an enrollment of about 800 students, composed of 625 undergraduates, 135 master's students, and 40 Ph.D. students.

Given that no school of design like the one we are recommending currently exists, there is no single model against which these recommendations may be measured. The numbers above are based on information from programs at various universities that resemble some aspect of the school recommended here, adapted to the scale of our campus at build-out in ten to twelve years (i.e., roughly 30,000 students and 1,500 faculty). Nevertheless, the following brief overview of some existing programs demonstrates the plausibility of the recommended numbers. (For a more detailed survey of existing design programs in the U.S., see "Appendix H: Survey of Design-Related Programs at Other Institutions" on page 115.)

- The MIT Media Lab has 30 faculty and about 180 graduate students, 67 of whom are pursuing the Ph.D. There is no undergraduate program per se, but

about 100-200 undergraduates from MIT are employed or granted academic credit for working in the Lab each year. The Media Lab has an annual budget of $35 million and is entirely self-supporting from corporate sponsorship (90%), government grants, and individual donations.

- The College of Environmental Design at UC Berkeley, which includes the Department of Architecture, has a broad-based design program incorporating visual literacy as a large portion of its undergraduate curriculum. It places about half of its graduates in positions outside the field of architecture, has 38 faculty, 635 undergraduates, and a total of about 360 graduate students in several different degree-programs.
- The Politecnico di Milano, the premier engineering school in Italy, started a school of design four or five years ago; it now has 600 students and is the second most popular major in the university.
- The school of design in the College of Fine Arts at Carnegie Mellon University includes 180 undergraduates and about 40 graduate students; last year, it awarded 16 graduate degrees, 44 undergraduate degrees, and the school admitted 46 freshmen (including students from China, Hong Kong, Italy, Japan, Korea, Puerto Rico, Spain, Switzerland, Thailand, and Turkey in addition to those from across the U.S.).

Aside from specific examples, systematic data summarizing enrollment in U.S. design programs is mostly non-existent. The sole exception is an annual survey of members of the National Association of Schools of Art and Design (NASAD), a specialized professional accrediting agency. NASAD's data, however, is problematic in at least two ways. First, accreditation by NASAD (and consequently membership in NASAD and inclusion in its annual survey) is voluntary, meaning that many prominent universities are not included in the survey. For example, no UC campus is included in NASAD's data, nor are Stanford University or the highest-ranked institutions in New Jersey and New York. Second, the degree programs summarized in the NASAD data include B.F.A. and M.F.A. degrees in design, but not B.A., B.S. and M.S. degrees in design. Their data for Ph.D. programs is restricted to art history and criticism, and art education.

Given these deficiencies, NASAD's data cannot be used by themselves to make detailed projections of the likely size of a new school of design at UC Irvine. Still, they may serve to give an "order of magnitude" assessment. At the undergraduate level, in Fall 1999 there were 68,504 students enrolled in 178 degree programs with at least 65% art/design content, or an average of about 385 students per program. At the graduate level, there were 6,591 students enrolled in M.F.A. (or equivalent) programs at 101 institutions (65 students each on average) and 310 Ph.D. students enrolled at 12 institutions (about 26 students each, on average).

Library

A School of Design at UC Irvine will not require a separate library of its own, though the campus will have to expand its present holdings in this field significantly. Since those holdings are presently split between the Main Library and the

Science Library, greater coordination between those two sites will be necessary. The required space must be accommodated in general plans for the expansion of library space on campus. In addition, a research librarian with expertise in design must be hired at a very early stage in the development of the school to oversee the development of the collection in this field.

This designated research librarian for design will also serve the information, research, and instruction needs of the design faculty, students, and staff. The UC Irvine Libraries' research and instructional services will provide innovative programs for information literacy and dynamic outreach services to undergraduates. The students will be offered individualized reference services, library classes on research methodologies and resources, eReserves, electronic reference assistance (email and livechat), a library website providing quick links to electronic resources, and a host of online research tutorials. There may be an additional need for an archival assistant who can manage, catalog, and archive materials such as design models, drawings, and artifacts, as well as other elements of the design showcase.

The comprehensive and interdisciplinary nature of the School of Design proposal will require the UC Irvine Libraries to acquire research and instructional resources, online and in print, in a wide range of areas and at a depth that is not currently supported. In order to meet the needs of the School of Design, the UC Irvine Libraries will need to expand collections in: architecture; interior design; industrial and project design; urban design; landscape design; design management; materials science; and related areas. The UC Irvine Libraries should also provide software and multimedia resources that complement the School of Design labs, and be involved in the assessment, selection, and coordination of these resources.

Undergraduate Education

Courses and Instruction

Undergraduate education in the School of Design at UC Irvine will emphasize broad interdisciplinary exposure to a wide range of topics and approaches to design, coupled with more extended study in one of the four specializations. A major in design will be offered leading to either the B.S. or the B.A., as described below. A minor in design will also be available to students majoring in other units. Students in the School of Design will have to meet the usual breadth requirements for the whole campus, and they will also be able to fulfill some of the requirements for the major through courses offered in other departments by prior arrangement with those faculty and units. Many courses in the School of Design will be open to students from across campus, including some lower-division courses that may be approved to satisfy present breadth requirements for the campus. Courses in modeling and simulation, as offered by the School, may be of particular value to students in several other units.

Courses in the School of Design will consist of lectures and seminars but also will incorporate multi-disciplinary training and collaborative team-projects into the curriculum. The seminars and these practice-based forms of instruction will incorporate the use of computing, tools, media, and applications of emerging technologies appropriate to design practice and education. The seminars will be based on formal instruction and will require substantial amounts of reading and writing, but in many cases they will also involve closely supervised studio work associated with the topic of the course. In addition, all students will be required to complete at least two full years of independent studio-work, including a senior project that must include a substantial written account of the intellectual and cultural dimen-

sions of the project, and an oral presentation. (For a notional undergraduate curriculum, see "Appendix C: Sample Design Curriculum" on page 73.)

Tracks

Specializations provide focus for a school. They identify what the school believes are key intellectual centers of inquiry, and they provide the bases for four tracks that will identify what graduates—potential employees—have emphasized in their studies. The tracks proposed for the undergraduate majors in design reflect many factors: emerging intellectual trends and concerns, emerging or extant commercial needs, and practical considerations of what may be achieved with the expected resources and talent pool. All students will be required to have some work in each of these tracks. For students with more specific and traditional professional objectives, courses from the tracks could be combined to create an interdisciplinary focus on a particular application, such as vehicle design, and/or to provide the basis for graduate study in a related field such as architecture.

DESIGN STUDIES

All students in the School of Design will be required to take a course in "Design Studies." This large lecture course will be a historical and theoretical introduction to the most important ideas, movements, and individuals in the history of design. Students who wish to continue their study of design from this perspective will be able to specialize in design studies, a program leading to the B.A.

In contrast to the more practice-based tracks, Design Studies will emphasize a more humanistic, cultural, and theoretical approach to design analogous to degree-programs in the history of art or literary and cultural studies. It will also stress facility in the written, oral, and visual communication of ideas about design. Like all students in the School of Design, those pursuing a degree in design studies will be required to take introductory courses in all of the specializations in the school as well as the usual breadth requirements for the university. Other courses in design studies will approach design from the perspective of the social sciences, including psychology, anthropology, and economics as well as survey techniques, statistics, and research methodologies characteristic of the social sciences.

Students in design studies may elect to complete a senior thesis, or they may complete a senior project in design similar to that in the practice-based specializations. However, the project in Design Studies will include a more substantial written presentation that includes extensive research and reflection on the conceptual background of the project.

This specialization will equip students with the broader and more sophisticated conceptual framework usually lacking in most design programs, and it will emphasize the ability to communicate those concepts clearly and effectively in verbal and visual presentations. Students from this specialization shall therefore be ideally prepared for master's-level work in more narrowly focused professional design programs or in academic subjects such as material culture or visual studies,

and for immediate entry into careers in advertising, business, and public relations and project management for design firms and cultural institutions.

INTERACTION DESIGN

At the undergraduate level this track will lead to a B.S. degree in design.

The undergraduate track in interaction design will share many elements with related programs in other universities, such as Carnegie-Mellon. A solid grounding, through course work, in human-computer interaction, computer-supported cooperative work, and software systems development is thus a given. The broader focus for interaction design proposed here, however, demands a correspondingly greater breadth in the undergraduate program.

The abstract nature of "interactions" will require a core focus on means for their representation and for reasoning based on abstract models. Students' difficulty in appreciating and developing such models will be eased through use of deep examples from a variety of domains. These examples, such as airline cockpit design, powerplant control rooms, driving a car, and interactions with complex computer applications will be carried across courses and can serve as the basis for studio projects.

Success in interaction design will also require that students be trained in ergonomics, human behavior factors, visual representation and manipulation of information, and culturally specific factors in interaction design.

As with the school's other specializations, the track in interaction design is not apprentice-based. While examples, hands-on work, and studios will comprise an important part of the curriculum, the goal is equipping students with the methods and techniques necessary for them to approach new problems and to be articulate about the problems they address and the solutions they create.

The key facilities needed to support the track in interaction design are state-of-the-art computer and software platforms and effective simulation and evaluation laboratories. Much of interaction design involves either building applications for computers or using computer-based tools for representing and analyzing interactions, so good facilities here are essential. Simulation laboratories will enable study of richer interaction contexts such as the airplane cockpit and process control rooms mentioned above. Such labs will be a mix of generic computer displays for virtual reality and physical devices specific to the example domain (such as joysticks, control button panels, and so on).

Graduates from this track will be prepared for careers in a wide range of industries, from those engaged in process controls, to transportation systems design, to the design of computer-based interfaces to products.

PRODUCT DESIGN

At the undergraduate level this track will lead to the B.S. degree in design.

Consistent with the earlier description of the specialization in product design, students will take courses in a wide range of topics, including, for example, courses in materials, mechanics, the management of production, modeling and represen-

tation techniques, intellectual property, and market analysis. Students will, of course, also take the school-wide required core courses. The track will involve elements of practice, theory, and methodology, with the intent of producing students capable of leading design teams that can see products move from initial conception through production and sales. Rather than focusing on just one type of product, the courses will emphasize techniques and practices that will enable tackling of novel problems.

Of the four undergraduate tracks, product design will require the most in terms of space and facilities. As with interaction design, students in product design will require access to computer workstations equipped with state-of-the-art software for 3-D model representation, analysis, and visualization. Taking designs from electronic models to physical reality will be an important part in the educational process.

While some generic physical modeling and fabrication facilities will be essential, the program will benefit from specialized facilities that support advanced product development in selected domains. Vehicle design is an obvious choice for one of these domains, as the facilities can also be used by students in the graduate specialization in vehicle design. A variety of other domains are also possible; interests of the initial faculty in the school guide these decisions. One particularly enticing possibility, however, is to focus on products which critically employ novel and emerging technologies, such as nanodevices and "smart fabrics." Students in the year-long senior studio in product design will be primary users of the fabrication facilities, leading to the year-ending design exhibition.

The potential for utilizing corporate internships is particularly high for this track. With product design being such a widespread activity, we anticipate many such opportunities. These partnerships with industry will be especially valuable in focusing attention on the interplay between business needs and technical considerations. We thus anticipate a wide range of opportunities for immediate employment upon graduation. This undergraduate specialization is also intended as a feeder to the graduate specialization in vehicle design.

SPATIAL DESIGN

At the undergraduate level, this track will lead to a B.A. or B.S. degree.

The track in spatial design will focus on teaching the knowledge, techniques, and skills for the design of physical environments. This will include, but not be limited to, design of urban spaces, buildings, landscapes, ecologically appropriate settings, interiors, and graphics. It will involve thinking about environments in a manner not confined by current disciplinary areas. Thus, even though the students will learn about building design, this program will not be concerned solely with architectural structures, but will involve the design of spaces and spatial elements, such as floors, walls, ceilings, and roofs. Such designs will incorporate ideas provided by ecological sensitivity, environmental sustainability, and technological advancements, including rethinking of spaces and spatial elements due to the advent of smart buildings and appliances, and the design of smarter objects that employ novel ideas from the interactions with product design, interaction design, and design studies.

It is conceivable that students of spatial design will devise new building technologies, new materials for solving current problems with buildings and to enable activities and lifestyles not yet imagined. Examples, though visionary, might be development of special fabrics for curtains that control the quality and temperature of inside air while making the building explosion-proof; the design of spaces that control temperature and humidity in areas without the need for walls; or the ability to use a wall to display information.

In order to enable thinking beyond the confines of traditional disciplines of architecture, landscape architecture, and interior design, the students of spatial design will take many courses with others in interaction design, product design, and design studies to enable cross-fertilization. Spatial design students will obtain a strong grounding sensitizing them at the very beginning to concerns of usability; ecological and environmental sensitivity; cultural appropriateness; and effects of their designs on humans, other species, and the environment. They will be taught using the concerns and problems they identify, and the future they envision; they will devise innovative designs that are not limited to spatial or architectural solutions, but that also include multi-level and multi-product solutions.

This major will take advantage of time-tested approaches, such as the use of large lectures, smaller seminars, and studios. In addition, more recent and innovative approaches, such as technology-enhanced studios and workshops, will train these students in the newer modes that future designers will need. Hands-on modeling will require modeling courses, and thesis projects will enable synthesis of all they have learned along with what they have developed as their design philosophies.

In order to properly service the pedagogical needs of this major there will be a need for large lecture classrooms (technology enhanced); smaller seminar rooms (a few with technology enhancements); studios with drafting tables, drafting stations and computer workstations; an environmental simulation laboratory which will enable the control of spatial elements and other features (such as control of lighting, sound, vibration, smell, etc.).

Computer labs need to be equipped with state-of-the-art machines. Laboratories and workshops for the construction and testing of models, gadgets, appliances, and for the making of conditions to be tested in the environmental simulation lab will be necessary. These will also be computer enhanced and have possibilities of working with wood, metals, earth, concrete, plastics, and composites.

The approach and breadth offered here are not offered in other schools of architecture, landscape design, or interior design. We expect that many students in this major will seek to obtain a minor in environmental design in the School of Social Ecology in order to augment their ability to learn about human behavior, cultural factors related to design, and how the environment affects people from the health and psychological perspectives.

Transfer Students

Undergraduate degree programs in the School of Design will have high appeal to students transferring to UC Irvine from California community colleges. With minor changes, the proposed undergraduate curriculum will accommodate students transferring to UC Irvine after one or two years. Staff in the School of Design will work with local community colleges to ensure coordination in the curriculum.

Educational Opportunities

Several unique, special, and standard educational opportunities are envisioned for the School of Design at UC Irvine. While we recommend continuation of those standard mechanisms that will work well, we envision several special and unique opportunities that will strengthen the way the design curriculum is offered.

Standard classroom lectures, small seminar courses, and large lecture courses will be fairly similar to those currently available on the UC Irvine campus.

STUDIO COURSES

Studio courses require students to test and apply the principles and techniques they learned in lecture and seminar courses to specific, challenging problems. Both individual work and team projects will be accommodated depending on the way the course is planned by the professor. Projects can be hypothetical and futuristic or real-life problems brought to the professor or selected by him/her.

The complexity of studio problems demands a broad, multidisciplinary approach, while the concrete nature of the project keeps the students grounded in details. Given our intended breadth and integrative approach, studios will be used throughout the curriculum, emphasizing multi-disciplinary training and team approaches. Studios, by their very nature, will require students to work under close supervision of faculty. Because of the intensive time commitment on the part of students and faculty, enrollments in studio courses will be limited to approximately 15 students each.

VIRTUAL AND IT-ENHANCED STUDIOS

The School of Design at UC Irvine must take advantage of the remarkable possibilities for education and practice offered by virtual and IT-enhanced studios. These will offer possibilities for problem solving, modeling, teamwork, theorizing, and testing.

INDEPENDENT STUDY

Independent study courses are common at UC Irvine; such courses in the School of Design will enable students to not only do research with faculty but also to work on design projects of their choice. This will provide students additional opportunities for specializations in sub-areas.

DIRECTED STUDY

Like directed study courses in existing schools at UC Irvine, these courses will enable students to participate in ongoing faculty research and design projects. In the School of Design, these courses will also facilitate participation of students in design projects not covered in studio and real-world courses. For example, if a student is interested in designing an object/house for his/her parents, this course will facilitate such a project.

APPLIED PROBLEM SOLVING

Corporate sponsored studios and projects offer a particularly valuable type of studio experience, one in which the grounding in reality is very strong. Our anticipated relationship with The Design Academy shall yield many such opportunities, to the benefit of students and the strengthening of ties with the industrial sector.

INTERNSHIPS

Internships at sponsoring companies represent an exciting opportunity for students to apply their knowledge in real-life situations and to be confronted with challenges that they will bring back to the university. Internships give students a chance to experience the flow of practice and the management and flow of projects. Internships afford opportunities for heuristic inquiry with rich response cycles. The typical internship experience will be enhanced with an internship seminar where students, using email and distance education technology, will meet once a week with classmates and a teacher to reflect on their experiences and share ideas.

INTERNATIONAL OPPORTUNITIES

There are tremendous educational opportunities offered by many universities around the world that can benefit students at the School of Design at UC Irvine. Accordingly, the curriculum has been made flexible to enable our students to take advantage of the opportunities already evident. Working with The Design Academy and UC Irvine's Education Abroad Program, students in the school will have the opportunity to study specialized topics in design through an international consortium of leading design schools around the world (see "International Consortium: The Academic Alliance" on page 25 and letters from some of those schools in "Appendix I: Supporting Letters" on page 129). In addition, these international exchange opportunities provide the possibility of students from those universities coming to study at UC Irvine, thus enriching the atmosphere here and providing tangible and intangible benefits for those students unable to go abroad.

SPEAKER SERIES, WORKSHOPS, AND CONFERENCES

Visiting speakers, conferences, and seminars are of particular importance in a school of design. Not only do they provide interesting and innovative intellectual possibilities; listening to and talking with renowned designers can provide immense intellectual and creative stimulation for students in the school. A particular emphasis for all such events will be interdisciplinary perspectives.

DESIGN EXHIBITIONS

An annual design exhibition staged by the school will familiarize students with each other's work, and showcase that work to potential employers and to the community. The exhibition will feature the work of the junior- and senior-level design studios and will be open to the public.

HONORS PROGRAM

The School of Design will offer a school-wide honors program that will enable motivated students to produce research papers, design projects (real-life or hypothetical), or combination projects under the close supervision of faculty, and to exhibit their accomplishments. The program will culminate in a required senior thesis.

MINOR IN DESIGN

A grounding in the foundations of design could serve as a highly useful adjunct to many majors across campus. Accordingly, a minor in design will be offered. As with other campus minors, a set of approximately nine courses would be required, including the introductory sequence in design (as indicated notionally in "Appendix C: Sample Design Curriculum" on page 73) and a one-quarter introductory class in each of the major specializations of the School.

UC Irvine Minors of Interest to Design Students

DIGITAL ARTS

This minor is appropriate for designers wishing expertise in digital imaging and multimedia in the context of a broader exposure to the arts.

ENVIRONMENTAL DESIGN

The existing minor in environmental design offered in the School of Social Ecology introduces students to issues related to human, psychological, social, cultural, and health concerns related to designed environments, as well as to several design skills many of which are not usually taught in schools of design (such as environmental programming, post-occupancy evaluation, cultural ecology and environmental design, environmental psychology, diversity of populations and design). These materials are complementary to the curriculum in the School of Design. This minor will help expose students to this special area and form a strong mechanism for cross-campus collaboration between two schools.

INFORMATION AND COMPUTER SCIENCE

The minor in ICS will be of particular interest to students in the interaction design specialization, as well as students in product design who desired to emphasize products incorporating computing elements. Students in spatial design may wish to pursue this minor if their interests include developing technologies for supporting spatial design.

MANAGEMENT

For students interested in the application of design in business settings, knowledge of management practices, administration, and finance is an important complement to the design specializations described above. Such students will be encouraged to meet the requirements of the Graduate School of Management's undergraduate minor in management.

The School of Design will offer a course (or courses) particularizing this knowledge to the design world, emphasizing understanding, assessing, and developing design processes, the business of design, the role of design in corporations, and intellectual property issues.

URBAN PLANNING

This existing minor, offered through the School of Social Ecology, introduces students to the field of urban and regional planning. Students completing this minor will be prepared to pursue employment and graduate training in urban design and urban planning.

Accreditation

The School of Design will prepare to seek accreditation by the National Association of Schools of Art and Design (NASAD), which accredits U.S. programs in art and design. Twenty-seven California colleges and universities have programs that are accredited by NASAD, including Art Center College of Design (Pasadena); California Polytechnic State University (San Luis Obispo); San Jose State University (San Jose); and California State Polytechnic University (Pomona). Other universities or colleges with NASAD-accredited programs include the College for Creative Studies (Detroit); Carnegie Mellon University (Pittsburgh); and Ohio State University (Columbus). Though not all schools of design are NASAD-accredited, accreditation review can ensure a well-rounded and robust curriculum. Additionally, NASAD accreditation will enhance the reputation of the School of Design. NASAD guidelines are flexible, and should not conflict with the curriculum proposed for the school.

The School of Design will not seek NASAD accreditation immediately, but will establish its coursework in accordance with NASAD guidelines. NASAD accreditation will be pursued in approximately two to three years after the first class of students are admitted. Seeking accreditation at that time will ensure that the curriculum and program communications are refined and will increase the likelihood of a favorable NASAD review.

Career Placement

In addition to the usual campus activities assisting in career placement, we anticipate significant roles for the internship program discussed above, The Design Academy, and for annual exhibitions. The Design Academy (see "The Design Academy" on page 62) will foster close working relationships with companies in the design industry that will expose students to potential employers through the sponsorship of studios, internships, prizes and fellowships, and sponsored projects. An annual design exhibition staged by the school will further support such exposure. The exhibition will feature the work of the junior- and senior-level design studios and will be open to the public.

Demand

Demand for people trained in design has been increasing rapidly in the past five years, and that demand is sure to grow dramatically in the near future. As noted above, *Time* magazine did a cover story on "The Rebirth of Design" (Gibney and Luscombe 2000) in which the authors proclaimed design to be one of the fifteen hottest professions of our time in terms of job growth, salaries, and other financial compensation. *The Industry Standard* (Kim 2000) noted the intersection of architecture with graphics design that fuels the booming business in web-design. The *Orange County Register* (Knap 2000) did a story that indicated the extent to which design (as opposed to commercial and manufacturing interests) is driving much of the auto industry today. And in a story titled "Architects Becoming a Rare Breed in Their Own Field," the *Los Angeles Times* discussed how various elements of architectural training have equipped new graduates to work in a wide range of design jobs: "Now architectural firms are finding themselves in competition with firms in industries that are willing to pay more for young designers and graphic artists" (Newman 2000). The *LA Times* article claims competition for new designers has resulted not only in higher salaries but also in intensive recruitment, including companies visiting design schools to identify new graduates and promising students and (in at least one case) offering bonuses to any employee who recruits a designer successfully.

As also noted earlier, the U.S. Bureau of Labor Statistics (B.L.S.) has projected an 11.5% growth rate nationwide for the profession of design between 1997 and 2005. Between now and 2010 they are predicting around a 20% growth rate nationally (United States Department of Labor 2001). Locally, that increase is projected to be even greater. Charles Pelly of The Design Academy has estimated that there are about 5,000 design-related professionals in Orange County, and he predicted that the present companies in Southern California could employ about 200-500 more designers every year—quite apart from the influx of design firms to the area expected in the next decade. He reported that General Motors has recently had sixty openings for designers, and that graduates of design schools can be offered in special cases $100,000 and more as starting salaries in such positions. According to the B.L.S. and the Industrial Designers Society of America, "the median base salary, excluding deferred compensation, bonuses, royalties, and commissions, for an industrial designer with 1 to 2 years of experience was about $36,500 in 2000. Staff designers with 5 years of experience earned $45,000, whereas senior designers with 8 years of experience earned $64,000. Industrial designers in managerial, executive, or ownership positions earned substantially more—up to $600,000 annually; however the $80,000 to $180,000 range was more representative" (United States Department of Labor 2001).

Wallace Walrod, former Vice President of the Orange County Business Association, confirmed this demand for people trained in design and predicted similar growth in the field locally and nationally. Dr. Walrod said that design is one of five "industry clusters" that the Business Council has identified as candidates for strong regional and national growth in the near future. The Council believes that Orange County has a sustainable competitive advantage in these fields, and through a coordinated effort with the county the Council plans to be investing

economic and work-force dollars in this area. (The other fields are biomedical technology, microelectronics, software, and advanced precision instruments.)

Demand in the field of design in Britain is surveyed more systematically by the Design Council based in London, and that data indicates burgeoning demand in the field there. According to their publication *Design in Britain* (The Design Council 2000), "The UK's design industry is booming–1999 fee income for the country's top 100 consultancies … was up by 20% on 1998" (p. 12). The number of full-time staff in these 100 consultancies is also up 20%. The top ten firms report increases in fees of 34% to 130% in that period (p. 13). Design is also flourishing in undergraduate and postgraduate education in Britain. The total number of students in design at both levels combined is up 24% over the past four years, versus an overall increase in first-year students of 16%. There are 255 programs in design, and since 1998-99, the number of students in "art and design foundation courses" has increased from 13,500 to 15,000. Design courses taught through "further education" programs (i.e., continuing education or extension) enrolled 222,573 students, an increase of 62% since 1994-95 (vs. total growth in further education of 48% during that time) (p. 21). One other measure suggests the increasing interest in design studies worldwide: from 1994-95 to 1998-99, the number of design students in Britain who came from overseas increased 112%, from 1,223 to 2,598 (p. 22).

For enrollments in programs in design at institutions in California and across the United States, see "Appendix H: Survey of Design-Related Programs at Other Institutions" on page 115.

Graduate Education

Master's Specializations

Some students seeking master's level training in design will do so on the basis of a background in design and perhaps extensive professional experience. Such students will seek additional specialized training; other students may seek education in design at the master's level without such a background. We therefore propose two corresponding master's tracks. For students lacking a background in design training, we propose an interdisciplinary, schoolwide masters leading to the M.A. in design degree. (This is similar in spirit to the three year M.Arch. degree typically offered by architecture programs for students with limited previous experience in architecture or design.)

For students with an appropriate background in design or related fields, we propose specializations as described below. These programs will lead to an M.S. in design.

INTERACTION DESIGN

A master's specialization in interaction design will build upon the foundational material in the corresponding specialization and undergraduate program described above, offering advanced topics and engaging students in research projects.

VEHICLE DESIGN

Automotive design, and more generally vehicle design, is witnessing a remarkable renaissance. Instead of the mass production of thousands of identical vehicles, an era is emerging in which every customer can have a uniquely designed vehicle. Dramatic improvements in safety and environmental sustainability have arisen through application of novel technologies and materials. New concepts for vehicles are emerging which reflect a new understanding not only of customer desires,

but also the effects of vehicles on urban areas and society. By itself this renaissance warrants inclusion as a master's program in a new school of design because Southern California is emerging as a national leader in automotive design and is poised to become an international design center.

Further impetus for inclusion in the new school is provided by the remarkable evolving assemblage of automobile makers in Irvine, including design studios, as well as associated research and design companies, such as Wireless Car Corporation. Ford Motor Co.'s Premier Automotive Group, which includes Lincoln Mercury, Jaguar, Aston Martin, and Volvo, recently opened a design center at its new Irvine headquarters, and Hyundai Motor America in Fountain Valley is reportedly seeking a site in Orange County to open a new design center that also will do work for Irvine-based Kia Motors America. These new studios will complement the existing presence of Toyota, whose Calty Design Research is in Newport Beach; BMW, with its highly influential Designworks/USA subsidiary in Newbury Park; and Porsche, with a presence in Huntington Beach. Some of the most successful and innovative car designs of recent years have emerged from Southern California, including the Chrysler Prowler and the Mazda Miata.

We therefore propose to create a major emphasis at the graduate level on vehicle design, placing emphasis on the design of vehicles "in context" and as shaped by emerging technologies. By "context" we refer to the complicated set of public policies, social aspects, environmental concerns, and business constraints and objectives within which vehicles are designed, used, discarded, and recycled. The multidisciplinary emphasis, with aspects of aesthetics, ergonomics, information technology, representation of intangible concepts, processes, modeling, and simulation, is consistent with the theme espoused for the entire school, and will uniquely position this specialization in the field.

By placing this emphasis at the graduate level, our intent is to attract students with a solid background in engineering, physical sciences, or computer science who wish to augment their understandings, skills, and knowledge so they can effectively contribute to the design of vehicles for use in the coming decades. A vehicle design specialization at UC Irvine within the School of Design will benefit from the growing commercial automotive design presence, enhance UC Irvine's current strengths as found, for instance, in the Institute for Transportation Studies, and produce a cadre of trained professionals with distinctive, comprehensive qualifications for the workforce.

An expanded discussion of this topic can be found in the accompanying sidebar on page 43.

PRODUCT DESIGN

A master's specialization in product design will build upon the foundational material in the corresponding specialization and undergraduate program described earlier, offering advanced topics and engaging students in research projects. We do not anticipate the M.S. in product design to begin immediately, however. In an important sense, the specialization in vehicle design is a subset of product design. The opportunity for developing vehicle design is especially strong, and therefore we propose to develop that area first, establishing a distinc-

Vehicle Design

Vehicle design and research in vehicle design is far removed from sketching pictures of jet-propelled race cars in high-school notebooks. Vehicles, especially automobiles, play large and important roles in society. Many of the world's largest companies are devoted to producing them; our national energy policy is shaped by their prevalence; the way our communities are structured reflects their ubiquity and demands. Automobiles affect our attitudes, and they are a major factor in public health, from their effect on the environment to a major source of injury, disability, and death. Given this complex web of relationships, it is no surprise that the successful design of vehicles is a very difficult task. As a subject of intellectual inquiry and perhaps at its most abstract level, vehicle design is the process of reasoning about and managing an enormous and changing set of constraints and goals, few of which are amenable to formal, precise statement or direct engineering-style analysis. For example, while visual representations of vehicles do play a very important role in design, an important research challenge is creating and interrelating effective representations of the numerous other concepts involved in vehicle design, such as inter-vehicle interactions, the driver's information and control space, vehicles in a framework of traffic laws and signals, and so on. The field has an immediacy that motivates and compels our attention, with enormous intellectual reach and long-term consequences.

Existing programs in other universities around the world take a variety of approaches to this set of challenges. Most programs reflect the history of automobiles and their construction and do not consider the complex set of relationships in which vehicle design occurs. For instance, many universities have programs or courses in automotive design, housed in schools of engineering. Many of these programs emphasize mechanical engineering topics, others focus on production engineering, but programs of this type typically do not consider issues of public policy, aesthetics, environmental sustainability, and so on. Many do not even consider ergonomics. For example, in 1999, the University of Michigan began a graduate professional degree (Master of Engineering in Automotive Engineering), for instance, which emphasizes traditional engineering topics as applied to automotive problems (University of Michigan 2001). A similar program at the undergraduate level can be found at Central Michigan University (Central Michigan University 2001). In the United Kingdom, similar programs can be found at Loughborough University (Loughborough University 2001) and elsewhere. On the other hand, vehicle design at schools like Art Center College of Design in Pasadena (http://www.artcenter.edu/) and Coventry University's Design Institute (http://www.csad.coventry.ac.uk/des-inst/) reflect a historical grounding in the arts, focusing on visual and tactile aspects. Art Center has been highly influential in the automotive industry, but its students are not required to have any background in the sciences or engineering. The courses that students take at Art Center are focused sharply on visual aspects of vehicles, their public branding, and the processes by which such designs are produced.

The integrated approach to vehicle design we are recommending will produce graduates capable of leading design teams focused on novel, challenging, and critical problems. For instance, a range of design problems can be seen in considering Toyota's shared use electric vehicle concept, or "e.com." This vehicle "is a two-passenger 'neighborhood' or 'community' vehicle designed to provide convenient and efficient operation within the community. It is not designed to operate on freeways. Rather, it is designed to operate on city streets with ease of parking, and to provide an attractive alternative for short commutes, business lunches, and the variety of business and personal errands that often consume the day." UC Irvine's Advanced Power and Energy Program (APEP) and The Irvine Company have been cooperating in an early evaluation of Toyota's current version of this vehicle, which may become a key element in a broader study focused on shared use and ties to urban rail transportation centers. Successful design of vehicles such as Toyota's requires the understanding and use of new and unproven technologies and must account for consumer acceptance, availability of convenient charging facilities, safety, and cost. More broadly, however, the shared use concept requires consideration of urban planning, business influences, and creation of effective information technology for overseeing vehicle management, reservations, accounting, and real-time tracking. A broadly trained designer of UC-caliber could be a key contributor in such a project, whether addressing environmental aspects, performance requirements, style, or production issues.

tive identity for the School. After a small number of years, the graduate emphasis in product design would be brought forth, expanding from the undergraduate specialization as well as the vehicle design emphasis.

SPATIAL DESIGN

A master's specialization in spatial design is an important "core" for graduate education in the proposed School of Design. Spatial design fields—and especially architecture—provide an essential disciplinary underpinning and a tradition of theory and research that will support graduate education in all areas of design. Unlike many traditional programs in architecture, which focus exclusively on conventional professional training necessary for accreditation and licensing, the master's in spatial design calls for an interdisciplinary graduate specialization in spatial design, merging architectural design with landscape architecture, environmental design, and urban design. As in the undergraduate specialization, the master's program will prepare students to practice spatial design in a range of scales and mediums. The program will be especially appropriate for students who completed a more specialized or traditional undergraduate design degree in architecture, landscape design, or interior design.

The master's program in spatial design will complement UC Irvine's existing master's degree in urban and regional planning (MURP), and offer valuable elective courses for MURP students. Though MURP students' interest in urban and environmental planning is high, the Department of Urban and Regional Planning (URP) currently offers only one or two professionally-oriented courses in these areas, due to limited faculty resources. At the same time, master's students in spatial design will benefit from URP faculty expertise in environment behavior research—the study of human and environment interactions. UC Irvine represents one of the top programs in the U.S. in that field.

Because of its interdisciplinary nature, the UC Irvine master's program in spatial design will not compete with traditional master's programs in architecture (at Cal Poly San Luis Obispo, Cal Poly Pomona, SCIARC, USC, and UCLA, as well as UC Berkeley). The UC Irvine master's program in spatial design will fill an important gap in graduate education related to urban and landscape architecture, which do not exist in Southern California (in the case of urban design) or are not presently offered in a research university (in the case of landscape architecture). (Southern California master's programs in landscape architecture include those at Cal Poly Pomona and Cal Poly San Luis Obispo.)

UNIVERSAL DESIGN

With changing attitudes towards design, questions about who is served well, who is included, and who is excluded through design, are becoming increasingly more important. Design that is more responsive to different people is seen as the next new frontier and important objective for designers. Recently, terms such as "inclusive design" and "universal design" are being used to bring attention to these issues.

A number of societal factors have made these considerations more salient and urgent. Attitudes toward disability have been changing. Persons with disabilities have been emerging from back rooms; their disabilities are now viewed not as medical conditions but as situations in which their functioning in daily life is related to barriers in society and the failure of society to provide adequate and optimal conditions for their inclusion. In part, large numbers of veterans returning from wars with disabilities who had experienced life before as able-bodied have been responsible for changing the perspective. They offer dramatic proof

that a person can go from being able to having a disability due to a disease, war, accident, and that it can happen to anyone, as several authors have aptly described (Murphy 1987; Gutman and Gutman 1968). "We only become aware of our limited eyesight when small print forces us to rummage for our reading glasses. It is not our impairments that are the problem, but the poor design of products which turns them into a source of disability," contests Coleman (2001, p. 16). This new perspective sees building and other designs as disabling and presenting barriers rather than enabling and empowering. Innovations such as the wheel chair provided many persons having disabilities with mobility if the design of the environment was accessible, but mobility impairment is only one of various obstacles confronting some 40 million persons with disabilities in the U.S.

Exclusions do not have to be based solely on disability due to injury or disease. They can include differences in height, weight, seeing ability, hearing ability, mobility, culture, language ability, and even aging. An aging population also leads to considerations of enabling older persons to be independent, active, and productive. As people are living longer and healthier lives, they also feel the need to participate in what life has to offer and are not satisfied with being limited to only some areas, buildings, and spaces. Considerations for enabling persons with differing abilities thus eventually becomes a crucial design problem for everyone.

Designers can provide environments that are "universal" or more "inclusive." They can design better products that enable independence, reduce the chances of injury, and mitigate problems with current products and services. Wheel chairs, universal seats, telephones with large numbers, appropriate lighting, products with sure grips, etc. are only a few examples of several products currently available, but much more needs to be done (see, for example, Preiser and Ostroff 2001; Null and Cherry 1996). As Coleman says, "Design interventions can make a significant difference, by extending disability-free life, reducing dependency and increasing the usability of products" (2001, p. 18).

Although there are several programs in the U.S. teaching a few courses in accessibility, UC Irvine can assume leadership by taking advantage of its unique multidisciplinary School of Design to offer a master's degree in inclusive design that is not limited to architectural and planning concerns only but possesses a greater concern for inclusivity in all design. There is much scope for innovation in teaching. Recently proposed ideas include: pairing designers with the excluded (Coleman 2001, p. 31); immersion (Warfield 1983); sampling or short term experience (such as using a wheel chair or other device for a day); new ideas, such as "usability assessment of products and services" (Coleman, p. 31); and innovative ones, such as advocacy of the excluded. For example, Coleman (p. 32) points out: "The consistent lesson is that working with and understanding the needs of specific groups of users can lead to real innovations in design and implementation that can benefit us all."

There is much scope for research as well. Little is known about the nature of issues and concerns related to inclusivity. Some research had been done into requirements and development of standards, such as the work by the Architectural and Transport Barriers Compliance Board (ATBCB or Access Board), American National Standards Institute (ANSI), and Americans with Disability Act

Accessibility Guidelines (ADAAG). Yet, much more research needs to be done into a variety of topics, such as classroom noise, hearing impairments and loss, sight impairments, reach, and many other problems that have not been documented well.

We hope to produce a new generation of designers that will build inclusivity into all designs. We see the master's level as the most appropriate place to provide this specialization, which will introduce these considerations to designers who seek a career in the field. It can be a useful blend of research and praxis. Eventually, when a body of literature and adequate texts have appeared, we expect some of the essential considerations to be introduced at the undergraduate level. Given the dearth of useful research information, especially in product design, and the inability of building designs to respond by 2001 to these considerations which were introduced back in the 1960s, there appears to be much scope for interdisciplinary design research and explorations in this area. A master's program will provide the catalyst for the development of this research.

> We need to ensure that the environment is supportive of people in all their activities—products for daily living in the home, local transport to shops, offices and other workplaces, retail, leisure and learning environments (Coleman 2001, p. 24).

DESIGN MANAGEMENT (M.B.A./M.S. OR M.B.A./M.A.)

The increasingly prominent roles that design and design management are playing in business argue strongly for a specific focus with the School of Design. The design management track focuses on understanding, assessing, and developing design processes and an organizational design culture, the business of design, brand design, and legal and intellectual property issues in design. For instance, a fully realized successful invention still requires a significant effort to manage the transition to a successful product. This program provides unique experience with the management challenges involved in transforming research innovation into a successful commercial enterprise.

The movement of product innovation from the design engineer to manufacturing and marketing requires understanding of design controls; verification, testing, quality and safety certification; manufacturing controls; customer validation; intellectual property management; patent infringement analysis; and product liability. Innovative technology often involves not only timely manufacture, installation, and reliable service, but also a need for continuous education and training, as well as a program of design changes to address customer needs. With the advent of the Internet and the rapidly growing area of the design of virtual shopping environments, new questions are being addressed that have implications for design management in the virtual marketplace.

Ideally offered in cooperation with the Graduate School of Management (GSM), students pursuing this track could also enroll in the M.B.A. program, with some electives in the M.B.A. program drawn from the design management track. This programmatic organization is similar to that used in the Healthcare Executive M.B.A. programs at UC Irvine, and it is one of the most popular options in graduate design programs where available. Cooperation between programs in design and schools of management is supported nationally through the Corporate

Design Foundation, which collaborates with such programs at UC Berkeley, Carnegie Mellon, Columbia, Harvard Business School, Stanford, and many other major research universities (Corporate Design Foundation 2002). Many institutions in Europe have already formally established the necessary links between design studies and management education.

As further testimony to the ideas proposed here, one must take a look at the activities of the Design Management Institute (DMI). DMI is a professional organization based in Boston, Massachusetts, linking design professionals to academics through organizing conferences and creating other opportunities for exchanging ideas. The Summer 2002 issue of the DMI's influential *Design Management Journal* was devoted to the subject of "Academic Trends in Design Management." One of the key points raised in a lead article is that there is no reason why management schools cannot get involved in design issues, since they already deal with select areas of product development and branding. Other articles provided strategies for achieving this goal.

There is a logical and natural connection between the creative aspects of design and the management of design. Many design issues are closely linked to product innovation and development, which also translate into market acceptance and the construction of brand image. The links between the School of Design and the Graduate School of Management are obvious. Current GSM courses of interest to students in the design management track include: new product development and planning; management of innovation; marketing of high-tech products; brand management; advertising; technological forecasting; and Internet marketing.

Ph.D. in Design

DESCRIPTION OF THE PROGRAM

The School of Design at UC Irvine will offer a Ph.D. in design. The doctoral program will be based on a comprehensive, interdisciplinary approach that investigates the conceptual and theoretical foundations of design processes and methodologies, and that incorporates a deep understanding of the social and cultural issues associated with the role of design today, in the past, and in the future. Doctoral students will contribute directly to the development of a theoretical paradigm and intellectual vision for the field, and they will be expected to assume positions of leadership in the transformation of design into an academic discipline. (For an account of how the field is changing, see "Vision" on page 5.)

The program will include seminars offered by faculty from the School of Design and from other units across campus. Admission will be restricted to candidates holding a master's degree in design or in a field directly related to the proposed topic for the dissertation. Students with a bachelor's degree in design or a related field, or students with a master's degree in a field unrelated to design, may be admitted to the doctoral program pending successful completion of the M.A. or M.S. in design at UC Irvine. The doctoral program will be rather small at first, admitting only 3–4 students per year for a total enrollment of about 15–20,

though as explained below this number is likely to expand significantly given the rising importance of the Ph.D. in the field of design.

Requirements for the Ph.D. in design at UC Irvine will include formal coursework in advanced graduate seminars, a qualifying examination, and a dissertation. The dissertation must be based on original research and a review of the pertinent literature, and the topic should be suitable for publication as a monograph or in professional journals. A design project (the creation of a new product), protocol analysis, and/or other practice-based activities may also be required for the degree, but they cannot substitute for the dissertation. Committees for the examination and dissertation will be composed of faculty from the School of Design and from other units, reflecting the interdisciplinary nature of the doctoral program and the field.

Specific areas for doctoral research will reflect the expertise of the faculty and the interests of the students, though oriented toward some of the areas of emphasis at the undergraduate and master's levels as described above: design studies, interaction design, product design, spatial design, universal design, and design management. (See "Areas of Research" on page 55 for a discussion of the range of topics and methodologies appropriate to a Ph.D. in design.) The student's primary area of research may be supplemented by a secondary interest in some other area of the School of Design or through coursework in another unit by agreement of the student's advisor. This secondary interest may be pursued formally as a joint degree (e.g., the Ph.D./M.B.A.), as an official emphasis (e.g., emphasis in women's studies, critical theory, etc.), or as an informal set of courses approved in advance as part of the student's doctoral coursework.

In keeping with the rapid growth in the academic market for Ph.D.s in design, as discussed below, candidates for the degree will be required to develop skills in teaching to be prepared for academic careers. Development of such skills may take place through courses, mentoring, serving as teaching assistants, leading seminars, or directing undergraduate projects.

Doctoral study will be funded by a combination of corporate support, faculty research grants, fellowship support from the university, and teaching assistantships. Corporate support plays a larger role in doctoral (and master's) education in design than in most other fields. The customary forms of support are fellowships, internships, and funded projects (which may include undergraduate and master's students as well).

The doctoral program proposed for the School of Design at UC Irvine reflects the best practices in other doctoral programs around the world. There are few such programs, even though a consensus is quickly emerging among professional designers concerning the importance of research and academic training to the future of design. This situation therefore presents an extraordinary opportunity for UC Irvine to assume a position of highly visible leadership among academic design programs worldwide.

RATIONALE FOR A PH.D. IN DESIGN

There is a growing interest in the Ph.D. in design at many universities around the world (see "Current Doctoral Programs in Design" on page 50). That interest is driven by the intellectual need to develop a coherent disciplinary paradigm that can provide a better understanding of present practice and methodology, and that can serve as a platform for theoretical and scientific innovation in the future. Consequently, the Ph.D. in design is presently viewed primarily as an academic credential rather than a professional qualification, and most students pursuing the degree imagine a career in research and teaching at a university. However, many corporations and design firms now realize the value of doctoral education in their creative and commercial settings, and they are beginning to look to universities to produce candidates for new positions and to train their present employees. Deane Richardson, co-founder of Fitch, Inc., an international design firm (Fitch Worldwide 2001), has described this shift as a response to new needs and opportunities in the profession:

> Designers need better research skills and increased capabilities to be able to work on more complex design problems, and on a team basis. Designers have always been creative thinkers and doers with a unique set of skills, but designers have not always been well utilized by upper management in other industries. Advanced education will help maximize the contributions designers can make to economies around the world, both strategically and tactically. Design education must anticipate the expanding needs of the design profession and Ph.D. programs are one of those paths (Richardson 2000).

To be sure, this attitude is not universal among professional designers, but resistance to it is waning quickly for practical as well as idealistic reasons. Larry Keeley, who helped develop the Ph.D. program at the Illinois Institute of Technology (IIT), notes that the resistance to research and theoretical sophistication is most prevalent in those sectors of the corporate world experiencing rapid growth at the moment. They can afford it, literally, because those sectors do not depend—for now—on primary research to drive that growth and expansion. The problem, Keeley says, is that the present growth cannot last, and without research these sectors will not be able to adjust effectively to new situations: "At Harvard Medical School or Sloan Kettering, they are doing many things that expand the frontiers of medicine. Where is the design equivalent? Not at consultancies, which can and should develop urgently-needed web sites as fast as possible. So it comes as no surprise that they see little or no need for Ph.D.s. What is interesting is to question how the field itself progresses, and where the breakthrough new services will come from that reinvent consulting in our profession" (Keeley 2000). In short, as Carolyn McCarron says, "Design educators want to promote design from a trade to a profession—via doctoral education" (McCarron 2000, p. 1).

MARKET FOR THE DEGREE

Ph.D. programs are so new to the field of design that their effects on the profession can only be projected in the future. In most academic programs at major research universities, the Ph.D. is the preferred degree for faculty, even if it was conferred in a field outside of design (engineering, communications, etc.). In Japan, for example, the doctorate has become *de facto* criterion for appointment, and that practice is becoming increasingly common worldwide, including the U.S (Durling 2000, p. 292). Outside academia, the typical attitude toward the Ph.D. degree is often more ambivalent but increasingly marked by a cautious or even

grudging support for doctoral training as necessary to the intellectual but also financial future of the field. Clement Mok, Chairman of the Innovation Advisory Board at Sapient, an international business and technology consultancy, has expressed reservations about Ph.D. programs that might be "all thinking and no doing," but he adds that "I respect the model of Ph.D. programs; the rigor is needed in the design field." Only research can help us understand "missing cultural artifacts: What are the things that are being replaced and displaced by new technology … is this a good thing, or a bad thing?" (McCarron 2000, pp. 3-4). Thus Patrick Whitney, Director of the Institute of Design at the Illinois Institute of Technology and holder of the Steelcase/Robert C. Pew Chair, has claimed that Ph.D. education should be the "intellectual engine" driving the field of design, but he also says that it should remain a "small, small segment of the field" (McCarron, p. 2). The market for the Ph.D. in design may therefore best be described at present as growing rapidly in academic design programs and strong in principle in the field, but to this point untested in the corporate context.

CURRENT DOCTORAL PROGRAMS IN DESIGN

The increasing importance of the Ph.D. in academic design programs and in more progressive, research-oriented sectors of the corporate world has led to a dramatic increase in the number of Ph.D. programs in design over the past two decades. (For a discussion of this connection between the development of design as a discipline and the emergence of Ph.D. programs, see Krippendorff [1999]. Justice [2000] discusses the more general curricular impact of this development.) Those programs vary in their emphases, but they are generally defined by elements common to all Ph.D. requirements: advanced (post-master's) coursework under the close supervisions of mentors; a qualifying examination (usually written and oral); and a written dissertation of substantial length. Many, though not all, of these programs also include the development of a product, process, or project in conjunction with the dissertation. However, unlike many master's programs in design and programs offering the Doctor of Design (D.Des.), programs offering the Ph.D. almost always treat the object or process as a supplement to the written dissertation, and not a substitute for it. The dissertation is expected to take about two years after advancement to candidacy, with a total time to degree of four to six years, depending on whether or not the candidate already has a master's degree prior to entering the doctoral program (Friedman 2000b).

The doctoral programs in design discussed below also have two other important features in common: they are fundamentally interdisciplinary, and they provide opportunities to do different kinds of research as the basis for the dissertation.

The interdisciplinary character of Ph.D. programs in design derives from the nature of the field itself, which traditionally has depended on teams of people with different forms of expertise and experience, and from the changing nature of the problems that designers confront today. Steven Skov Holt, Vice President at frogdesign, has said

> Enormous opportunities for the design profession are being driven by the possibility to meaningfully combine features, objects, materials, technologies, and ideas previously considered to be separate.… The designer as the singular creator of discrete objects has been supplanted by a new vision of the design professional

> as orchestrator of complex systems in which information, materials, sensations, and technology are in a state of flux (Holt 2000).

In addition to this change in the field of design itself, because design is relatively new as an academic discipline, faculty interested in design tend to be housed in different departments and schools around the university rather than being hired exclusively in a department of design (Tellefsen 2000). These more practical bases for the interdisciplinary character of design education complement the conceptually interdisciplinary projects characteristic of design thinking since the Design Methods Movement of the 1950s, a perspective that led to the interdisciplinary Design Research Society in 1966 (Archer 2000). The inherently interdisciplinary nature of design as a practice and a discipline is further reinforced in universities by the growing popularity of interdisciplinary study in most academic fields over the past decade, a situation that has made it easier to imagine institutional and administrative structures that can accommodate a Ph.D. in design.

Doctoral programs in design in the U.S. are described below. Note that the official departmental home of a degree, and even the formal areas of emphasis, can be misleading because design degrees are often awarded through the units in which the programs first emerged and do not always reflect the recent evolution of those programs across disciplinary boundaries or through interdisciplinary interactions with other units. For example, most architecture programs offer a Ph.D. in architecture that includes design theory and history, graphic imaging, etc.; the programs listed below stress (or allow for emphasis in) those broader aspects of design, though that distinction is becoming increasingly less clear in many programs. Conversely, many programs in different fields offer master's degrees in design and a Ph.D. in the field without an explicit emphasis on design: Berkeley's Department of Architecture, for example, offers a M.A. in design but the Ph.D. in architecture only. Stanford's Department of Mechanical Engineering has one of the most respected master's programs in design—the Masters of Science in engineering: product design—but offers the Ph.D. in engineering only. Such programs are not listed below.

- Illinois Institute of Technology
  Ph.D. in design through the Institute of Design; currently 13 students enrolled (see the detailed discussion of the program below).
- Carnegie Mellon
  Ph.D. in design through the School of Design; four concentrations: design theory, interaction design, typography and information design, new product development. A detailed description of the doctoral program is available at http://www.cmu.edu/cfa/design/programs/phd/Ph.D.Program.pdf.
- Georgia Tech
  Ph.D. offered through the College of Architecture; focuses on "studies of human responses to the design of buildings and urban space." Fields of study focus on architecture and urban planning but include emphases such as design computing and building technology (Georgia Institute of Technology 2001).
- MIT
  Ph.D. offered through the MIT Media Laboratory. Approximately 30 faculty and 80 staff. Graduate enrollment of 190, about one-third of whom are Ph.D. candidates. Over 200 undergraduates also work in the Media Lab each year,

but formal enrollment is limited to graduate students. Research projects are organized loosely into four "consortia" funded primarily by corporate sponsors: "Digital Life," "Digital Nations," "Information-Organized," and "Things That Think." All students are full supported (tuition and a stipend), usually as research assistants, funded almost entirely by corporate sponsorship.

Also, a Ph.D. in Design Technology is offered by the Department of Architecture in the School of Architecture and Planning (distinct from the other Ph.D. degrees in Architecture and in Building Technology). This degree focuses on modeling techniques, imaging, and "the formalization of design theory and the expression of design knowledge" (Massachusetts Institute of Technology 2001).

- University of Minnesota
  Ph.D. offered in the Department of Design, Housing, and Apparel; areas of emphasis are apparel, design communication, housing, interior design, multimedia. There were nine Ph.D. dissertations completed in 1999 (University of Minnesota 2001).
- Harvard
  The Ph.D. in Architecture, Landscape Architecture and Urban Planning is offered through the Graduate School of Design, which enrolls about 550 students in its master's and doctoral programs. This Ph.D. program is one of Harvard's seven "interfaculty" programs and "is jointly overseen by the Graduate School of Arts and Sciences and the Design School. It is intended for persons who wish to pursue advanced scholarly work in the histories and theories of architecture, landscape architecture, and urban planning. (The Ph.D. program does not prepare students for design practice.) The Ph.D. program focuses on theoretical research that expands the frontier of knowledge" (Harvard University 2001a).

  A Doctor of Design is also offered: "The program leading to the degree Doctor of Design (D.Des.) offers advanced study and research in the design disciplines of the built and natural environments, and of virtual space. It is intended for persons who have already mastered professional skills and who seek to make original contributions to their fields. The D.Des. program focuses on applied research and emphasizes the advancement of knowledge in the design disciplines" (Harvard University 2001b).
- University of Colorado at Denver
  Ph.D. offered through the College of Architecture and Planning; areas of emphasis are land use and environmental planning and design; design and planning processes and practices; history, theory, and criticism of the built environment. Thirty-seven doctoral students are currently enrolled.
- University of Florida
  Ph.D. in Design through the College of Design, Construction and Planning, with areas including architecture, building construction, interior design, landscape architecture, and urban and regional planning. More than 90 students have enrolled, over 30 have graduated. Current enrollment is 40 doctoral students (University of Florida 2001).

- Arizona State University
  Ph.D. in Environmental Design and Planning, with Concentrations in design; planning; history, theory, and criticism.
- North Carolina State University
  Ph.D. in Design with two tracks: community and environmental design; information design.
- University of California, Berkeley
  The Berkeley Institute of Design (BID) will be one component of the new Center for Information Technology Research in the Interest of Society (CITRIS), one of the new UC Centers for Science and Innovation. BID will "define a new design discipline," combining aspects of computer science, architecture, industrial and mechanical engineering, and the visual arts. BID plans to offer the M.S. and Ph.D. degrees (University of California, Berkeley 2002a; University of California, Berkeley 2002b).

Doctoral programs in design offered outside the U.S. (a partial list):

United Kingdom

- Royal College of Art
- Staffordshire University
- University of Reading (started in the 1970s, this program is probably the oldest doctoral design program in the world)
- De Montfort University
- Loughborough University (introduced a "practice-based" model for doctoral education in design)
- Southampton Institute

Australia

- University of New South Wales (Sydney)
- University of Technology in Sydney

Finland

- University of Art and Design in Helsinki

Japan

- Tsukuba University

Germany

- University of Essen

Taiwan

- National Cheng Kung University

Italy

- Politecnico di Milano

There have been two international conferences dedicated to doctoral education in design—the first in Ohio in 1998, and the second in La Clusaz, France, in 2000. The proceedings from La Clusaz make it clear that research-based, doctoral-level education in design has become a priority for universities around the world, and that a consensus about the objectives and paradigms for research in design is forming quickly. That consensus, though still inchoate, informs the plans described here (Melican, Barros, Holguin, and Joh 1998).

The Institute of Design at the Illinois Institute of Technology formed the first Ph.D. program in design in the U.S. in 1993. The formation and structure of this program thus serves as a useful case study, though IIT is not a public comprehensive university like UC Irvine: IIT was formed in 1940, and is primarily oriented toward science and engineering but has both a law school and a business school. It has a total enrollment of about 6,000, two-thirds of whom are graduate students pursuing degrees in engineering, science, architecture, design, psychology, technical communication, public administration, business and law. It reports an annual research volume of $140 million and an endowment of $175.6 million (Illinois Institute of Technology 2001a). IIT describes itself as follows:

> One of the 16 institutions that comprise the Association of Independent Technological Universities (AITU), IIT offers exceptional preparation for professions that require technological sophistication. Through a committed faculty and close personal attention, IIT provides a challenging academic program focused by the rigor of the real world (Illinois Institute of Technology 2001b).

The Institute of Design was founded as the "New Bauhaus" in 1937 and merged with IIT in 1949. It originally offered undergraduate as well as graduate programs, but since it began offering the Ph.D. in 1993, its graduate programs have become so successful it suspended the undergraduate programs to allow the faculty to focus on professional training and research. The ID presently offers three degrees:

1. Master of Design (two-year professional degree) in human-centered design or design planning; there are three tracks: communication design, product design, and design planning.
2. Master of Science in design in photography.
3. Doctor of Philosophy in design. (Master's degree required for admission, but IIT offers a one-year M.S. for applicants who do not have a master's in design. Except for the program in photography, the M.S. is not available for students not admitted to the Ph.D.) There are five areas of research, all clustered around the general focus on "human-centered design:"
   * users and contexts;
   * media and language of communication;
   * interactive systems;
   * strategic design planning; and
   * design systems.

There are 12 full-time faculty, and 20 adjunct faculty. As of April 2001, ID enrolled 90 students in the M.Des. program and 15 in the Ph.D. program. All stu-

dents are full-time. (For a list of current dissertation projects with abstracts, see "Appendix G: Dissertation Projects at the Illinois Institute of Technology" on page 107.) Since 1996, the endowment of the ID itself has increased ninefold (Illinois Institute of Technology 2001c; Sato and Whitney 2001).

AREAS OF RESEARCH

The different kinds of research acceptable for the Ph.D. in design similarly reflect the range of problems and issues associated with the practice of design. There is an important distinction, however, between that practice—which is a proper (though not exclusive) object of undergraduate and master's programs—and the scientific, scholarly investigation of design appropriate for doctoral-level education, which has as its objective the production of knowledge that can serve as the conceptual and methodological basis for subsequent research and practice. As Keiichi Sato of the Illinois Institute of Technology says, "Design research, as scientific acts … produces knowledge in the form of theories, methods, and tools that compose the intellectual and methodical foundation of design discipline for better practice" (Sato 2000). Doctoral research for the Ph.D. is further distinguished from the self-reflection on professional practice associated with "practice-based doctorates" often designated as a "Doctor of Arts," a "Doctor of Design," a "Doctor of Education," etc., where the thesis itself may be subordinated to or even replaced by the product or project of professional practice. See, for an example, this distinction as described in the Harvard Graduate School of Design, quoted above. (This distinction is common to most graduate programs, but it has been worked out most systematically in the U.K. in a report by the Council for Graduate Education [1997]. See also Archer 2000, p. 260.)

Among Ph.D. programs based on scholarly or scientific research in design, there are usually several different kinds of research accepted for the dissertation project, any of which may be associated with different fields or topics. These differences are characterized in many different ways, but they usually include the following general areas, which frequently overlap:

- Design studies, or "history, theory, criticism"; includes the study of design products, designers, and the historical and social contexts in which they function, based on historical research, theoretical or philosophical reflection, and cultural and aesthetic analysis. This research most often resembles doctoral projects in the humanities.
- Protocol analysis, the study of designers and design processes through direct observation, "talk-aloud" journals, "peripheral" participation on design teams, and case studies (Newton and Marshall 2000). Projects in this area most often resemble those in the social sciences.
- "Research by design," the pursuit of design activity "to develop knowledge or understanding of aspects of the practice of the discipline, or the epistemological and ontological contribution that the discipline can make" (Redmond 2000). This research most resembles the work of faculty in arts programs with a significant graduate component. Though derived from the creation of a product (or work), the objective of this research is less the design and manufacture of the specific product than it is the discovery and publication of knowledge derived from that process.

- Methodological and technological research, the application of diverse disciplinary perspectives to design to determine, for example, how functions of a particular material or mechanical system may be extended or limited by the design of the product in which they operate, how psychological factors are related to the way a product is received and used, etc. This research usually reflects the disciplinary paradigms and practices brought to bear on a question: engineering, psychology, etc. Research projects in this last category can be conducted only in a design program housed in a major research university or with some other sustained access to expertise in a wide range of fields.

In most Ph.D. programs in design, these general kinds of research are associated with more specific and concrete topics. In an international survey of Ph.D. students in design at universities around the world, Melican et al. (1998) found that the following dissertation topics were cited most frequently by the doctoral students. They offer a more concrete overview of present doctoral research in design:

- the social, cultural and emotional aspects of human-product interaction;
- design methodology and design processes (especially cognitive aspects thereof);
- environmental impact reduction and design for sustainability;
- corporate design policy and strategy;
- manufacturing and production processes;
- interactive media and interface design;
- communication theory;
- behavioral research methods in design;
- national design policy and its impact on economic and cultural development;
- product aesthetics;
- design management;
- artificial intelligence in design;
- computer-supported design;
- bionics; and
- design history.

The inexact fit between the actual projects and the general fields designed by the doctoral programs reflects the interdisciplinary and dynamic nature of the field, which challenges the institutional boundaries of these programs in productive and exciting ways.

STUDENTS

The twenty-eight students identified for the survey by Melican et al. (1998) provide an instructive sample of the applicants that are attracted to a doctoral program in design. The international dimension of the sample was significant: the group represented 14 nationalities studying at 11 universities in seven countries. This variety reflects the scope of the survey itself, but it is instructive because most doctoral programs in design in the U.S. and the U.K. have a significant percentage of foreign students. (Most of the students surveyed by Melican et al. were enrolled in universities in those two countries.) The age of the students surveyed

ranged from 24 to 51 and averaged 33.5 (median 32). Nine of the twenty-eight were women, a substantially higher percentage than reflected in the membership of the Industrial Designers Society of America, which has only 10% women. This difference suggests not only a higher number of women entering the field, but a higher number preparing to assume positions of intellectual and professional leadership. Only four of the 28 entered Ph.D. programs immediately after completing a masters degree; 62% of the group had a masters degree in design, and 75% had earned a bachelor's degree in design or a closely related field. (Conversely, only 50% of the students at IIT had a background in design before entering the master's or doctoral programs.) Most of these students explained the primary reasons for pursuing a Ph.D. in design as personal motivations (86%), professional advancement (50%), and "personal, intellectual development" (54%).

The School of Design and Other Units at UC Irvine

The administrative independence of the School of Design at UC Irvine must not be allowed to become an obstacle to inter-school collaboration with other units. Design is a fundamentally interdisciplinary field, and like most academic design programs in comprehensive research universities, the School of Design at UC Irvine will have close intellectual and scholarly associations with other units on campus. The most common connections are usually with the arts and engineering and architecture, a situation that reflects the institutional emergence of academic design programs from these fields. Today, however, design programs are also often associated with the humanities and, increasingly, biomedical science and computer science. As the concept of design has expanded to include built environments and "human factors" research, programs in design are also affiliated with policy-oriented programs such as urban and regional planning or psychology, and with interdisciplinary programs in cultural studies, ethnic studies, and critical theory. And as design has become increasingly prominent in product development and marketing, and as the tie between business success and design innovation has emerged, the need for people trained in the area of design management has led to a growing interest in connections between programs in design and schools of business and management.

Relations between the School of Design and other units at UC Irvine will take many forms, as do our present inter-school connections. Some faculty in the School of Design are likely to hold joint appointments split between Design and another unit; other faculty in Design may collaborate with colleagues across campus in research centers or on specific projects; they may cross-list courses or teach in other programs; and, in addition to mounting curricula for students in the School, faculty in Design will also offer graduate and undergraduate courses at various levels open to students outside the School. Conversely, faculty from other units with an interest in design will be invited to offer courses through the School

of Design, and students in design will be encouraged to take courses available to them in other units where appropriate to their academic programs.

The Dean of University Extension has expressed his enthusiasm and support for a School of Design at UC Irvine, and courses offered through University Extension will provide an important complement to the research-oriented curricula offered in the School of Design. For example, University Extension has been offering various courses in design since 1979 that collectively have enrolled almost 2000 students and have issued over 600 certificates for completion of the different programs. Since 1998, these courses have been organized in a certificate program in digital arts that provides practical training in design tools, supervised internships, and other forms of professional development for designers working in many fields. Over 300 students have enrolled in this program since 1998, taking an average of three courses each year, and 87 certificates have already been awarded.

With a school of design at UC Irvine, such continuing education programs in design could be expanded to extend UC Irvine's influence and visibility by providing education and training to industry and businesses with large design programs. That influence would be felt locally but also globally, since University Extension has a significant program in international education that brings professional students to UC Irvine from all over the world. More courses in design would broaden the audience for this program, while building on the experience and infrastructure already in place in this unit. In addition, for UC Irvine students unfamiliar with basic software or other basic skills necessary to the field, courses offered through University Extension can provide instruction and training without university credit to supplement coursework for the design major and advanced degrees. (See the letter from Dean Gary Matkin forwarded with this proposal.)

Relations with the Design Community

PARTNERSHIPS WITH CORPORATE DESIGN

Most well-known schools of design enjoy close relations with the commercial design industry that facilitate the transference of academic research into everyday life. Through these relations, discoveries with the power to transform our lives are turned into the products, objects, and processes we buy and use, and students can gain invaluable hands-on experience in their fields even before they complete their degrees. In addition, most major schools of design receive substantial funding from corporations and companies around the world. For example, the Art Center College of Design lists twenty sponsored projects funded by commercial sponsors including Mitsubishi; Daimler Chrysler; Nokia; Universal Studios; Gap, Inc.; Reebok; and many others. Their "Design Associates" program lists 146 corporate members from many different industries, and the minimum required annual contribution is $5,000. The MIT Media Lab has an annual budget of nearly $35 million, and in 1998-99 more than 90% came from corporate sponsors, with government agencies and individual sponsors making up the difference (Massachusetts Institute of Technology Media Lab 2002, p. 3). Interestingly, only 50% of the Media Lab's corporate sponsors are based in the Americas; 25% are in Europe, and 25% in Asia.

Several national organizations facilitate interaction between academic design programs and corporate design firms. The Industrial Designers Society of America is the most comprehensive, and it holds a conference on design education each year (Industrial Designers Society of America 2002). The Corporate Design Foundation is a national organization devoted to supporting interaction between academic design programs and the corporate world (Corporate Design Foundation 2002). The Association of Professional Design Firms also has a strong interest in linking corporate design consultancies to academic training, especially in the field of design management (Association of Professional Design Firms 2002).

THE DESIGN ACADEMY

In addition to these general connections with the industry, the School of Design at UC Irvine will also have a unique opportunity to develop an association with The Design Academy. The Design Academy is a group of influential individuals and companies that is now being formed with the objective of serving as a liaison between the design industry and the academic training of designers at the host-institution. The Design Academy is being organized by Joan Gregor and Charles Pelly, founder and former owner of Designworks/USA (now a BMW subsidiary), one of the top ten design studios in the world. The objective of the Academy is to transform the teaching and practice of design internationally by encouraging a broad, syncretic approach to design in both academic and industrial contexts. More particularly, The Design Academy will help channel funding from the industry to an appropriate academic program, and it will help coordinate the teaching of design world-wide through exchange programs for faculty and students at the top schools of design around the globe.

The Design Academy has agreed in principle to designate UC Irvine as the exclusive host institution for The Design Academy should the School of Design described in this proposal be approved. In that partnership, The Design Academy will facilitate relations between the School and the corporate design community, offer a mentorship program, and it will help support UC Irvine's participation in an international consortium of design schools, firms, and corporations already being organized by Mr. Pelly and his partners in the Academy. As the host institution for The Design Academy, UC Irvine will serve in turn as an institutional liaison between the Academy and other universities, and will host conferences, seminars, and other academic events sponsored by the Academy. UC Irvine will retain complete authority over the academic programs in the School of Design and will be free to establish other affiliations in the design community as opportunities arise.

Implementation Plan for the School of Design

Our recommended implementation plan follows from a few basic beliefs and principles:

- the act of establishing a School of Design will create tremendous visibility and momentum which shall be used to full advantage;
- the current worldwide excitement and movement to establish design in academia offer a window of opportunity to establish a variety of important relations;
- high academic standards and tone must be established from the outset;
- programs of education shall begin only when all the necessary resources are in place, to ensure that all initial responses to the School are positive.

Formation of a School of Design at the University of California, Irvine, with the character and emphases espoused in this proposal, will generate national and international attention. It will be considered a bold and exciting move, yet one which is obviously timely. This chance for innovation and leadership on a global scale must not be squandered. The campus has a wonderful opportunity to attract senior leaders from around the world to help in the formation and establishment of the new school and to do something genuinely new and unique. This moment will not last indefinitely, however, and the opportunity cannot be fully realized without the bold institutional commitment that a new school will represent. For that reason, even though any new unit must obviously start with only a few faculty and students, UC Irvine must make it clear from the beginning that the objective of this initiative is a School of Design of the size and scope discussed in this proposal.

This ambitious goal and sense of opportunity shall drive key elements of the implementation plan, the most important of which is an aggressive strategy for recruiting prominent individuals to serve as dean and key senior faculty. These individuals will have responsibility in the first year for all the major planning associated with the school as well as the initial actions taken in support of that plan. To support this group of individuals we recommend establishment of a campus steering committee.

While this group of individuals is engaged in the detailed business of faculty recruiting, staff recruiting, degree and course planning, and facilities development, we believe it is important to begin simultaneously a series of events on campus to maintain and enlarge the visibility associated with the project, establish the intellectual tone for the school, and facilitate the establishment of working relationships both within the campus and with external partners, academic and commercial. For instance, during the first year a speaker series could be instituted, drawing prominent individuals to campus, thus better informing and shaping the planning process and possibly serving to attract scholars to UC Irvine as new faculty. Similarly a workshop or conference could be held, possibly in conjunction with hosting a design showcase of some type, or a journal might be started. Broad community involvement and interest could be enhanced by highlighting and coordinating with the design courses offered through UC Irvine Extension.

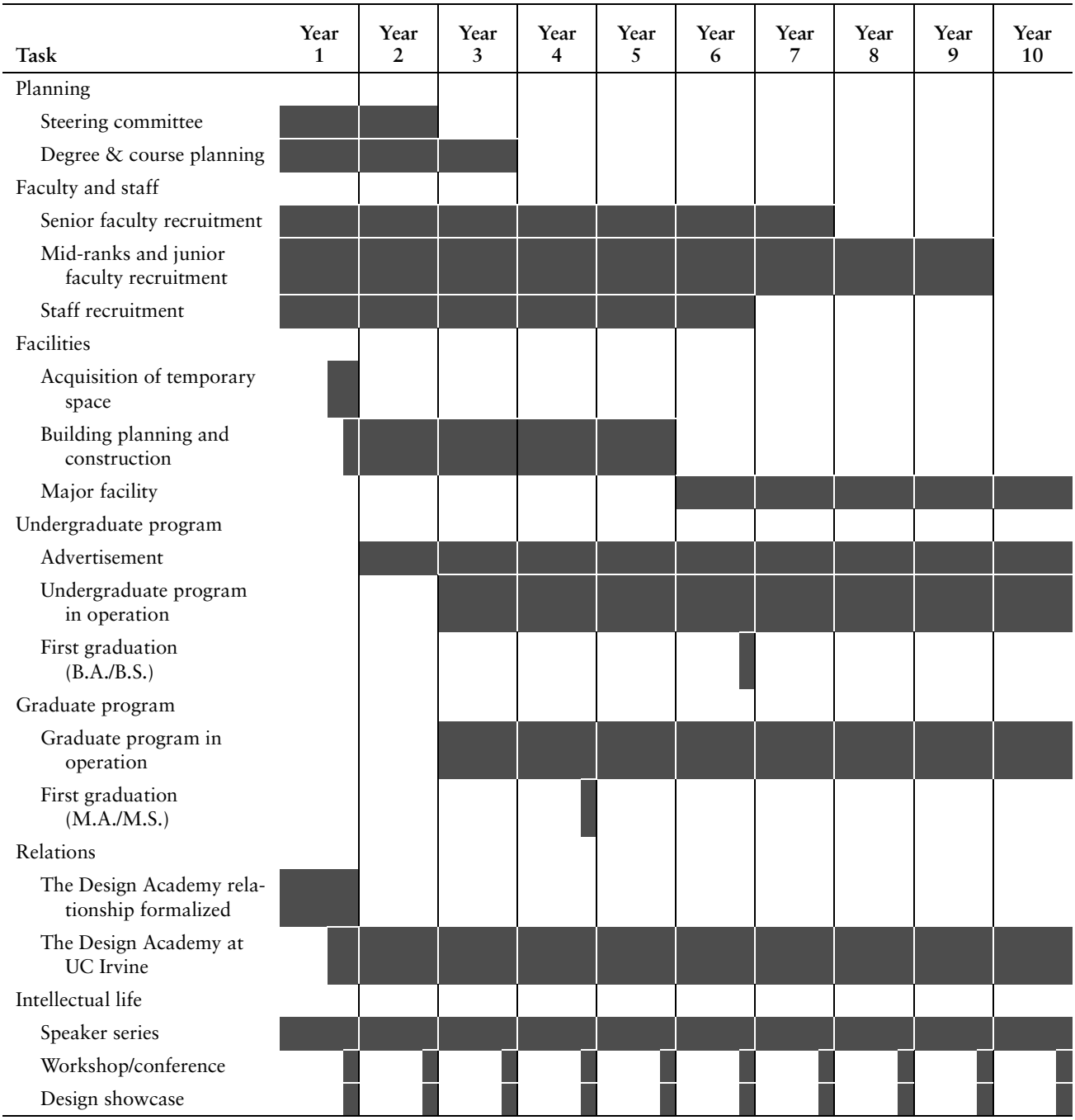
The importance of establishing high-value and high-profile external relationships shall be highlighted in the first year of implementation through formalization of UC Irvine's relationship with The Design Academy, and possibly by securing a commitment for the siting of the Academy on or near the campus, such as in the University Research Park. This relationship can be a cornerstone for establishing relationships with universities around the world as well as with local and national design firms. Such relationships will help, of course, in planning and recruiting, but may also accelerate establishment of the educational program, as through use of exchange programs.

Planning for facilities to house the school's activities must also take place in year one. The School of Design must be located on the main campus. Initially the school will of necessity use existing space on campus for offices, but it may also need to secure off-campus facilities in order to ensure that adequate facilities are in place by the time the instructional program begins. As mentioned elsewhere in this proposal, the school will eventually need a purpose-built primary structure. Given the lead time required for creating such a building, planning for it will similarly begin in year one and fund-raising plans shall be formulated for the private and corporate sectors.

With regard to initiation of the undergraduate curriculum, the notional course sequence presented in "Appendix C: Sample Design Curriculum" on page 73 includes many design classes in the first two years of study, upon which the upper division classes and studios build. Therefore it is essential that the undergraduate program not begin until the first year of courses can be adequately mounted. Given the expected latency in definition and approval of the undergraduate degrees and courses, the reasonable expectation, therefore, is that year one of development will focus on establishing the programs, year two on advertising and

recruiting the first cohort of students, and the cohort beginning classes at the start of year three. This is consistent with a plan to hire faculty on a staged scale; between external hires, the potential of existing UC Irvine faculty teaching some of the classes, and adjunct faculty, a full program will be viable in year three.

TABLE 2. Summary Implementation Schedule



A similar analysis applies to initiation of the graduate programs. Though the master's program will only be two years in length (nominally), the time needed to establish the curriculum, get the required faculty on board, and prepare the labs and studios indicates a launch date of the beginning of year three. This first group of master's students will therefore graduate before the first cohort of undergraduate students. The Ph.D program will commence at the same time: year three.

Current UC Irvine faculty from around campus will undoubtedly play a major role in effecting this plan. Several individuals have already expressed their desire to play roles in this school, including occupying joint appointment positions. As the focus of the school becomes better known and the opportunity for achieving something of such potential significance and visibility becomes clear, we expect several more to lend a hand. In addition, a few prominent professional designers have already expressed an interest in teaching as adjunct faculty on a regular basis, and while the number of such appointments will always be quite small, they can be especially helpful during the early stages of development and recruitment.

Appendix A: School of Design Committee

- Michael P. Clark, Professor, Department of English and Comparative Literature, School of Humanities and Associate Executive Vice Chancellor for Academic Planning
- Kristen M. Day, Associate Professor, Department of Urban and Regional Planning, School of Social Ecology
- Thomas Michael D'Zmura, Professor, Department of Cognitive Sciences, School of Social Sciences
- Douglas S. Goheen, Professor, Department of Drama, Claire Trevor School of the Arts
- Sanjoy Mazumdar, Associate Professor, Department of Urban and Regional Planning, School of Social Ecology
- J. Michael McCarthy, Professor, Department of Mechanical and Aerospace Engineering, Henry Samueli School of Engineering
- Molly Schneider, Director, Design Programs, University Extension
- Richard Taylor (Chair), Professor, Department of Information and Computer Science and Director, Institute for Software Research
- Alladi Venkatesh, Professor, Graduate School of Management

Staff to the Committee

- Melissa Barrett, Administrative Assistant, Executive Vice Chancellor's Office
- Jane Foley, Senior Analyst, Executive Vice Chancellor's Office
- Michael Poston, Principal Analyst, Executive Vice Chancellor's Office

Appendix B: Consultation Process

This proposal was developed in consultation with a wide variety of professional and academic designers. Many of them hold professorial appointments in departments or programs in design at major universities; others own their own design firms or are employed in large companies; and still others combine academic and professional appointments. Together, these consultants represent the full range of teaching and practice in design, both nationally and internationally, including leaders in related professional organizations and accrediting boards. The names of these consultants and their institutional and professional affiliations are listed below.

These consultations began over two years ago and have continued through the final revisions of the proposal. Interaction with these experts ranged from conference calls with the Committee, written correspondence, campus visits to UC Irvine, and in some cases a combination of all three. In addition, once a draft of the proposal was complete, we sent it to many of these people, plus additional experts in the field, for comment. Their written responses are included in "Appendix I: Supporting Letters" on page 129.

The Committee wishes to express its appreciation for the many hours these advisors spent with us, and for the support of so many leaders in the field of design in the United States and around the world. Although we did not take every piece of advice we received, the expertise of these consultants and their enthusiasm for our project was indispensable to the development of this proposal.

CONSULTANTS

Michael J. Bocchicchio
Assistant Vice President–Facilities Administration, University of California Office of the President

Ken Cloake
Director, Center for Dispute Resolution

Bill Dresselhaus
President, Dresselhaus Design Group, Inc.

Sir Christopher Frayling
Rector and Vice-Provost and Professor, Royal College of Art

Ken Friedman
Associate Professor, Norwegian School of Management

Joan S. Goldsmith
Author and management consultant

Kristina Goodrich
Executive Director, Industrial Designers Society of America (IDSA)

Charles L. Jones
Vice President, Global Consumer Design, Whirlpool Corporation

Lorraine Justice
Associate Professor and Director, Industrial Design Program, Georgia Institute of Technology

Jim Kaufman
Professor, Department of Design, The Ohio State University and Education Chair, Industrial Designers Society of America (IDSA)

David M. Kelley
Professor, Design Division, Mechanical Engineering Department, Stanford University and Chairman, IDEO

John E. and Katherine R. Littlewood
Former Director, Art Center College of Design (Switzerland)

Frank Nuovo
Vice President and Chief Designer, Nokia Design Center

Nirmal Sethia
Professor, Management and Human Resources, College of Business Administration, California State Polytechnic University, Pomona

Jonathan Schroeder
Professor and Director of Marketing, Department of Industrial Economics and Management, Royal Institute of Technology (Stockholm, Sweden)

Lynn H. Shook
President, Shook & Co. Design Consultancy and Former Creative Design Planner, Designworks/UCA/BMW

Martin Smith
Professor and Chair, Product Design Department, Art Center College of Design (Pasadena)

Craig M. Vogel
Professor, School of Design, Carnegie Mellon University

Ted W. Wells
Owner and Principal Architect, Living Simple Design

Marilee Zdenek
President, Right-Brain Resources, Inc.

ACADEMIC ALLIANCE

Gülay Hasdogan
Chairperson, Department of Industrial Design, Faculty of Architecture, Middle East Technical University (Ankara, Turkey)

J.J. Jacobs
Prof.ir. and Vice Dean, Faculty of Design, Engineering and Production, Delft University of Technology (Delft, The Netherlands)

Duncan Joiner
Pro Vice-Chancellor, College of Design, Fine Arts and Music, Massey University (New Zealand)

Darlie O. Koshy
Executive Director, National Institute of Design (Ahmedabad, India)

Alice Lo
Chair, Departmental Teaching and Learning Committee, School of Design, The Hong Kong Polytechnic University (Hong Kong, China)

Leon van Schaik
Pro Vice-Chancellor, Learning and Scholarship, RMIT University (Melbourne, Australia)

Yrjö Sotamaa
President, University of Art and Design Helsinki UIAH (Helsinki, Finland)

Kim Myung Suk
Chairman, Department of Industrial Design, Korea Institute of Science and Technology (Taejon, Korea)

Appendix C: Sample Design Curriculum

In the course of the committee's deliberations in creating this proposal, many programs at other universities, both in the U.S. and abroad, were examined. While most did not match our intended scope or integrative approach, the introductory text to several programs was very similar to some of the plans considered by the committee. Upon detailed inspection of the programs, however, a mismatch was found between the courses actually taught and the advertised philosophy—more often than not the curriculum reflected a very dated view of design education. Accordingly we felt obliged to provide a notional undergraduate curriculum so that the specific intent of the committee regarding design education was clearly understood. With minor changes, the proposed undergraduate curriculum will also accommodate students transferring to UC Irvine after one or two years.

To illustrate the range of topics we believe appropriate as electives in design, a notional list of courses is also provided. (The courses listed below are illustrative only, showing some of the range of courses which the school could usefully offer.)

TABLE 3. Sample curriculum for a B.S. in Design[a]

Fall	Winter	Spring
Freshman Year		
Creativity and innovation	Elements of design	Design processes
Intro. to design representation	Design studies: theory	Design tools and techniques
Breadth (lower-division writing)	Breadth (lower-division writing)	Breadth
Breadth[b]	Breadth	Breadth
Sophomore Year		
Intro. to interaction design	Intro. to product design	Intro. to spatial design
Culture and design	Human factors	Environmental issues and sustainability
Modeling and representation	Materials	Breadth
Breadth	Breadth	Breadth
Junior Year		
Level II specialization studio (one of analysis/ interaction/product/ spatial)	Level II specialization studio (one of analysis/ interaction/product/ spatial—distinct from Fall Quarter selection)	Level III specialization studio (one of analysis/ interaction/product/ spatial—in one of the areas pursued at Level II)
User-centered design	Social aspects of design	History of design
Design and perception	Business and management for design	Elective
Breadth (upper-division writing)	Breadth	Breadth
Senior Year		
Thesis/senior project	Thesis/senior project	Thesis/senior project
Designing for change	Professional practice, management and ethics	Elective
Elective	Elective	Elective
Breadth	Breadth	Elective

a. Laboratories or studio work are associated with a variety of these classes. "Elective" refers to courses within the School of Design, some of which may be mandatory for particular tracks.

b. Some of the specializations may have specific recommendations for classes to satisfy some of the breadth requirements. For instance, the specialization in interaction design will require a year-long sequence in software development, which could be satisfied by a course sequence from Information and Computer Science, as part of Breadth Category V.

TABLE 4. Notional elective courses

Elective Course	Description
Designing for groups	Examines the issues associated with artifacts and interactions involving multiple individuals. Coordination strategires. Cultural issues in group work.
Qualitative methods for designers	Ethnographic and other techniques for understanding usage contexts and eliciting design requirements.
Advanced materials	Examines the challenges and opportunities for designers arising from the emergence of novel materials and devices, including micro-electromechanical machines (MEMS).
Styles and pattern languages	Abstract architectural styles and design pattern languages. Their use in classical architecture, information systems design, and other design domains. Style description, formalization, relation to analysis, and tool support.
Acoustics	Introduction to acoustics for designers. Applications considered in buildings, automobiles, computer applications, and devices.
Symbolic and communicative aspects of design	Products can make "statements" far beyond their nominal functions. The role and mechanisms of styles in communicating values and ideas is explored, including consideration of cultural contexts and internationalization.
Learning from failures of design	Well-engineered products may nevertheless represent failures from the perspective of design and business. This course examines the nature of design failure and shows how analysis of failure can be used in improving new designs.
Architectural structures	Introduction to analysis of simple structures and systems, load calculations, live and dead loads, moments, shear forces, equilibrium conditions in structures, properties and strength of materials, and failures of structures.
Construction technologies	Introduction to building technologies, including timber, steel, brick, and concrete structures. Construction of foundations, columns, walls, beams, floors, and roofs. Critical issues in construction planning.
Legal context of design	Elements of intellectual property law and business practices in protecting inventions. Emphasis placed on new developments in protecting abstract entities, such as "look-and-feel."
Site conditions	Introduces students to key issues in site planning, relevant for land use planning, development and urban design.
Landscape planning and design	Survey of the history of landscape architecture; review of contemporary issues in landscape architecture. Includes study of precedents, vocabulary, and practice.

Appendix D: Budget Details

Details of the operating budget for the School of Design are presented in the following tables. The budget was prepared using constant dollars, with fiscal year 2001-02 as the base, ignoring salary range adjustments and promotions and merits for faculty and staff.

Other budget assumptions used to construct these estimates of the school's operating budget include:

1. The founding dean is recruited during year 0 and is in place by the beginning of year 1. Recruitment of additional faculty and staff begins in year 1 and continues until buildout is achieved. Undergraduate and graduate students are first enrolled in year 3; enrollments will grow each succeeding year, taking eight years to reach total proposed enrollments.
2. The school will not departmentalize during years 1-10.
3. Total enrollment at buildout will be approximately 800 students, with about 625 undergraduates, 135 master's students, and 40 Ph.D. students. Student attrition is assumed to be nil.
4. The time to degree for M.A./M.S. students will be two years and for Ph.D. students will be six years.
5. Total faculty size at buildout will be 40 FTE (including the dean). For salary costing purposes, faculty distribution is assumed to be: 1 FTE at Professor, Above-Scale for the dean; 13 FTE "senior faculty" at Professor, Step V; 13 FTE "mid-ranks faculty" at Associate Professor, Step III; and 13 FTE "junior faculty" at Assistant Professor, Step III. All faculty provisions are on the regular 9-month salary scale and are state-funded.
6. In years 2-4, approximately six faculty FTE will be filled each year, evenly distributed among senior faculty, mid-ranks faculty, and junior faculty. In years

5-7, four faculty FTE will be filled each year, and in years 8-10, three faculty FTE will be filled per year.

7. Each year there will be adjunct faculty, equivalent in number to 50% of the total permanent faculty FTE, teaching one course each, at an average salary of $5000 per course.
8. Teaching assistant FTE will be allocated to the school at an approximate ratio of 1 FTE per 44 headcount undergraduate students.
9. The composite rates used to calculate employee fringe benefit costs are the same as those used for sponsored projects (grants and federal/state contracts): 17% of salaries for permanent faculty; 7.3% for adjunct faculty; 1.3% for graduate student teaching assistants and research assistants; and 23% for career non-academic staff. Source: UC Irvine Research and Graduate Studies, http://www.rgs.uci.edu/cg/empben.htm, retrieved February 5, 2002.
10. Permanent non-academic staff will be hired on the schedule outlined in Table 8 in the dean's office, business services office, computing and network services, external affairs, facilities, faculty support services, and student services. Faculty support services staff will be hired on the ratio of 1 staff person to 4 permanent faculty FTE. Computing support staff for student computing labs will be hired at a ratio of 1 staff FTE to 200 headcount students. Undergraduate counselors will be hired at a ratio of 1 staff FTE to 250 headcount students, and graduate counselors at a ratio of 1 staff FTE to 80 headcount students.
11. For salary costing purposes, staff salaries were calculated using the mid-point salaries from the appropriate salary scale, a practice which is also in line with budgets for sponsored projects. Source: UC Irvine Research and Graduate Studies, http://www.rgs.uci.edu/cg/salwag.htm, retrieved February 5, 2002.
12. Faculty recruiting costs are estimated at $10,000 per recruitment. It is also assumed that each recruitment is successful.
13. Faculty set-up costs for newly hired faculty will be: $250,000 for the founding dean; about $140,000 each for senior and mid-ranks faculty; and about $117,000 each for junior faculty. This budget assumes that the set-up allocated to each new faculty member will be expended in that faculty member's first year at UC Irvine.
14. This budget assumes that all faculty receive $5,000 each in research and travel funds per year.
15. It is assumed the school will provide, from its own resources, fellowships to first-year Ph.D. students in the amounts of $20,000 each (to resident students) and $30,000 each (to non-resident students). It is also assumed that half of each first year Ph.D. class will be residents. Additional support beyond the first year will come from either teaching assistantships or contract and grant funding.
16. To facilitate access for its students, the school will establish two public-access computing labs of 25 stations each (one in year 3 and another in year 5). However, following the model at the Harvard Graduate School of Design, it is assumed that most students will have their own privately owned computers.

TABLE 5. School of Design Summary

	Academic Year									
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
ENROLLMENT (headcount)										
Undergraduate students	—	—	80	180	300	440	516	572	608	624
Graduate: Master's students	—	—	5	15	30	55	85	118	136	136
Graduate: Ph.D. students	—	—	3	8	15	22	29	36	40	42
Total	0	0	88	203	345	517	630	726	784	802
PERSONNEL (FTE)										
Regular ranks faculty	1	7	13	19	23	27	31	34	37	40
Teaching assistant	—	—	2	4	7	10	12	13	14	14
Staff	2	14	20	23	26	30	32	34	35	36
Total	3	21	35	46	56	67	75	81	86	90
EXPENSES ('000s)										
Academic salaries	$187.2	$673.5	$1,257.7	$1,837.4	$2,290.3	$2,760.0	$3,179.3	$3,471.5	$3,718.2	$3,932.2
Staff salaries	$169.2	$1,038.7	$1,483.1	$1,663.0	$1,840.6	$2,086.7	$2,214.6	$2,335.0	$2,392.2	$2,444.1
Operating expenses	$540.8	$1,202.2	$1,491.2	$1,614.7	$1,627.7	$1,778.7	$1,917.7	$1,798.8	$1,828.8	$1,938.7
Total	$897.3	$2,914.4	$4,232.0	$5,115.0	$5,758.5	$6,625.3	$7,311.6	$7,605.4	$7,939.2	$8,315.1
RATIOS										
Graduate enrollment as a percent of total enrollment	0.0	0.0	9.1	11.3	13.0	14.9	18.1	21.2	22.4	22.2
Total students (headcount) to regular ranks faculty (FTE)	0.0	0.0	6.8	10.7	15.0	19.1	20.3	21.4	21.2	20.1
Staff (FTE) to regular ranks faculty (FTE)	2.0	2.0	1.5	1.2	1.1	1.1	1.0	1.0	0.9	0.9

TABLE 6. School of Design Detail: Enrollment

	Headcount Enrollment per Academic Year									
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
UNDERGRADUATES										
First-year students	—	—	80	100	120	140	156	156	156	156
Second-year students	—	—	—	80	100	120	140	156	156	156
Third-year students	—	—	—	—	80	100	120	140	156	156
Fourth-year students	—	—	—	—	—	80	100	120	140	156
Subtotal: Undergraduates	0	0	80	180	300	440	516	572	608	624
GRADUATE STUDENTS										
Master's program										
First-year students	—	—	5	10	20	35	50	68	68	68
Second-year students	—	—	—	5	10	20	35	50	68	68
Subtotal: Master's program	0	0	5	15	30	55	85	118	136	136
Ph.D. program										
First-year students	—	—	3	5	7	7	7	7	7	7
Second-year students	—	—	—	3	5	7	7	7	7	7
Third-year students	—	—	—	—	3	5	7	7	7	7
Fourth-year students	—	—	—	—	—	3	5	7	7	7
Fifth-year students	—	—	—	—	—	—	3	5	7	7
Sixth-year students	—	—	—	—	—	—	—	3	5	7
Subtotal: Ph.D. program	0	0	3	8	15	22	29	36	40	42
Subtotal: Graduate students	0	0	8	23	45	77	114	154	176	178
TOTAL ENROLLMENT	0	0	88	203	345	517	630	726	784	802

TABLE 7. School of Design Detail: Academic FTE

	FTE per Academic Year									
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
REGULAR RANKS FACULTY										
Dean (Prof. A/S)										
Dean	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Senior Faculty (Prof. V)										
Senior faculty	0.0	2.0	4.0	6.0	8.0	10.0	12.0	13.0	13.0	13.0
Mid-ranks faculty (Assoc. III)										
Mid-ranks faculty	0.0	2.0	4.0	6.0	7.0	8.0	9.0	10.0	12.0	13.0
Junior faculty (Asst. III)										
Junior faculty	0.0	2.0	4.0	6.0	7.0	8.0	9.0	10.0	11.0	13.0
Total regular ranks faculty	**1.0**	**7.0**	**13.0**	**19.0**	**23.0**	**27.0**	**31.0**	**34.0**	**37.0**	**40.0**
OTHER ACADEMIC STAFF										
Number of courses (not FTE) taught by adjunct faculty	—	—	6.0	9.0	12.0	15.0	18.0	18.0	18.0	20.0
Teaching assistant FTE	—	—	1.8	4.1	6.8	10.0	11.7	13.0	13.8	14.2

TABLE 8. School of Design Detail: Staff FTE

	FTE per Academic Year									
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
PERMANENT STAFF FTE										
Dean's Office										
Assistant dean	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Assistant to the dean and the assistant dean	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Receptionist/administrative assistant	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Subtotal: Dean's Office	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Business Services										
Academic personnel analyst	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Business office manager	—	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Staff personnel analyst	—	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Financial analyst	—	—	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Financial analyst	—	—	—	—	—	—	1.0	1.0	1.0	1.0
Subtotal: Business Services	0.0	1.0	3.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
External Affairs										
Development director	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Assistant to the director/ External Affairs business manager	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Senior development officer	—	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Subtotal: External Affairs	0.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Computing and Network Services										
Director of computing	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Technical services manager	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Senior support technician (for faculty and staff)	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

TABLE 8. School of Design Detail: Staff FTE (continued)

	FTE per Academic Year									
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Administrative systems developer	—	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Support technicians (for students)	—	—	1.0	1.0	2.0	3.0	3.0	4.0	4.0	4.0
Junior support technician (for faculty and staff)	—	—	—	—	—	1.0	1.0	1.0	1.0	1.0
Subtotal: Computing and Network Services	0.0	3.0	5.0	5.0	6.0	8.0	8.0	9.0	9.0	9.0
Facilities										
Facilities manager	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fabrication shop senior engineer	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fabrication shop engineer	—	—	—	—	—	1.0	1.0	1.0	1.0	1.0
Subtotal: Facilities	0.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0
Faculty Support Services										
Administrative support staff	—	2.0	3.0	5.0	6.0	7.0	8.0	9.0	9.0	10.0
Subtotal: Faculty Support Services	0.0	2.0	3.0	5.0	6.0	7.0	8.0	9.0	9.0	10.0
Student Services										
Student affairs manager	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Undergraduate counselors	—	1.0	1.0	1.0	2.0	2.0	2.0	2.0	3.0	3.0
Graduate counselors	—	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0
Subtotal: Student Services	0.0	3.0	3.0	3.0	4.0	5.0	5.0	5.0	6.0	6.0
Total Staff FTE	**2.0**	**14.0**	**20.0**	**23.0**	**26.0**	**30.0**	**32.0**	**34.0**	**35.0**	**36.0**

TABLE 9. School of Design Detail: Operating Expenses

	Expenses per Academic Year (in '000s)									
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
OPERATING EXPENSES										
Faculty recruiting costs	$10.0	$60.0	$60.0	$60.0	$40.0	$40.0	$40.0	$30.0	$30.0	$30.0
Faculty startup[a]	$389.8	$792.7	$792.7	$792.7	$536.2	$536.2	$536.2	$396.3	$396.3	$373.2
Faculty research/travel funds	$5.0	$35.0	$65.0	$95.0	$115.0	$135.0	$155.0	$170.0	$185.0	$200.0
Graduate fellowships[b]	$0.0	$0.0	$75.0	$125.0	$175.0	$175.0	$175.0	$175.0	$175.0	$175.0
Equipment[c]	$25.0	$117.0	$278.0	$286.0	$414.0	$438.0	$460.0	$477.0	$493.0	$509.0
Office furnishings[d]	$9.5	$57.0	$39.0	$30.0	$23.0	$26.0	$20.0	$16.5	$13.5	$13.5
Other expenses	$101.5	$140.5	$181.5	$226.0	$324.5	$428.5	$531.5	$534.0	$536.0	$638.0
Total Operating Expenses	**$540.8**	**$1,202.2**	**$1,491.2**	**$1,614.7**	**$1,627.7**	**$1,778.7**	**$1,917.7**	**$1,798.8**	**$1,828.8**	**$1,938.7**

a. One-time costs for new hires only.

b. Provided out of school funds for first-year Ph.D. students only.

c. Annual costs, assuming 36-month leases.

d. One-time costs for new hires only.

Appendix E: Physical Facilities

The physical facilities for the School of Design at UC Irvine need to reflect the nature of the school, the nature of the research, and the education being provided by the school. There is a need for design studio space; information technology-enhanced studio space; computer labs for research and instruction; lab and workshop space; seminar classrooms; small, medium, and large classrooms (all technology-enhanced); exhibition space; modeling space; design display space; spaces for development of virtual reality; dedicated faculty office space; dedicated faculty research space; team research spaces; team project spaces; graduate student spaces; interaction spaces; and meeting spaces, among others.

The building shall reflect the innovative mix of specialization areas; meet the needs for education, research, and design projects; and provide spaces for creative endeavors central to a school of design. This School of Design building will be located on the main campus of UC Irvine in order to facilitate interaction with the other schools on campus and to enhance its interdisciplinary mission.

A permanent structure suitably sized to house a school of the scale envisioned in this proposal (625 undergraduates, 135 master's program students, 40 doctoral students, 40 faculty, and 36 permanent staff) would require a building of approximately 126,500 gross square feet (about 85,000 assignable square feet) and would cost approximately $34.8 million to construct.

TABLE 10. School of Design Physical Facilities Detail

Type of Space/Usage	Net Sq. Ft. (each)	Quantity Needed	Total Net Sq. Ft.
Office space			
Regular ranks faculty	150.0	40	6,000
Adjunct faculty and visiting professors	120.0	10	1,200
Graduate students	100.0	42	4,200
Permanent staff	120.0	36	4,320
Subtotal			15,720
Classrooms			
Small lecture rooms (20 sq. ft./student, 20 students)	400.0	5	2,000
Medium lecture rooms (20 sq. ft./student, 70 students)	1,400.0	4	5,600
Large lecture rooms (20 sq. ft./student, 140 students)	2,800.0	2	5,600
Conference rooms or group student rooms	500.0	5	2,000
Design studio rooms (25 students maximum)	1,600.0	5	8,000
Computer labs (50 sq. ft./student, 25 students)	1,250.0	2	2,500
Dedicated project space for upper division undergraduate and master's program students	37.5	450	16,875
Subtotal			42,575
Research and exhibition space			
Faculty research	400.0	40	16,000
Exhibitions	1,000.0	1	1,000
Subtotal			17,000
Administrative space			
Storage	1,000.0	1	1,000
Computing services and networking facilities	1,000.0	1	1,000
Dean's office suite	2,000.0	1	2,000
Document management and distribution (photocopying, mailroom)	1,500.0	1	1,500
Subtotal			5,500
Social spaces	4,000.0	1	4,000
Total net assignable square feet			84,795
Efficiency of building			67%
Total gross square feet			126,560
Construction cost of permanent building (@ $275 per gross square foot)			$34,804,000

Appendix F: Design Dissertations, 1999–2001

The following list of dissertations was produced by performing a keyword title search (using "design") of the ProQuest Information and Learning Company's Dissertations Abstract International (DAI) database (ProQuest 2001) and then screening the results to eliminate inappropriate responses. A search for dissertations completed since 1999 produced over 1,000 titles; a similar search with no restrictions as to year resulted in over 97,000 dissertations using the word "design" in the title.

The search results are presented below using the following format:

Dissertation title
Author, degree
School, date, number of pages in dissertation (if known)
DAI publication number (if dissertation is available from ProQuest)

Gestalt grouping effects on display design
by Addy, David L., Ph.D.
University of South Dakota, 2000, 80 pages
9966653

Design, development and analysis of a one degree of freedom experimental haptic display for virtual reality applications
by Agosto Gonzalez, Francisco Jose, M.S.
University of Puerto Rico, Mayaguez (Puerto Rico), 2000, 106 pages
1396672

Distributed information models and design decision optimization for electronics manufacturing
by Agrawal, Ashutosh, Ph.D.
Rennselaer Polytechnic Institute, 2000, 126 pages
9969139

Evaluation of web-based instruction in interior design education: a pilot study
by Blair, Katherine Nora, M.A.
Eastern Michigan University, 2000, 108 pages
1397955

Drawing place: an inquiry into the relationship between architectural design media and the conceptualization of place
by Canizaro, Vincent Brian, Ph.D.
Texas A&M University, 2000, 323 pages
9968894

Virtual insights: the design, development and evaluation of a strategy for online communication in teacher professional development
by Caron, Jeanette Yvette, M.A.
Concordia University (Canada), 2000, 103 pages
MQ47751

A point of sale interface analysis and design
by Dues, Gregory A., M.Eng.
University of Louisville, 2000, 107 pages
1398676

A methodology to design traffic signal controllers based on fuzzy logic
by Garcia Cabrera, Luis Ivan, M.S.
University of Puerto Rico, Mayaguez (Puerto Rico), 2000, 146 pages
1397852

The design of a simulation-based framework for the development of solution approaches in multidisciplinary design optimization
by Hulme, Kevin Francis, Ph.D.
State University of New York at Buffalo, 2000, 152 pages
9958275

Design of an automatic control for a material handling system
by Ibrahim, Rabih Youssef, M.Eng.
University of Louisville, 2000, 62 pages
1398678

Tract-house modern: a study of housing design and consumption in the Washington suburbs, 1946–1960
by Martin, Christopher T., Ph.D.
The George Washington University, 2000, 285 pages

9955473

Integrating multicultural content into curriculum, resource, and workshop design
by Pettigrew, Carolyn Landers, D.Min.
United Theological Seminary, 2000, 216 pages
9967560

Putting systemic evaluation into the design team process: walking the talk
by Ryan, Diana Faulkner, Ph.D.
Indiana University, 2000, 175 pages
996605

Representation in architecture: a data model for computer-aided architectural design
by Sola-Morales, Pau, D.Des.
Harvard University, 2000, 152 pages
9968452

Bargaining under incomplete information and the design of legal rules
by Talley, Eric Leonard, Ph.D.
Stanford University, 2000, 141 pages
9961969

Essays on the design of monetary policy with incomplete information
by Tetlow, Robert John, Ph.D.
Carleton University (Canada), 2000, 177 pages
NQ48354

The eye of the holder: a design system for eyewear
by Tharp, Biba Elizabeth, M.E.Des.
University of Calgary (Canada), 2000, 147 pages
MQ48246

Design of a web-based education environment
by Toole, Robert Leonard, III, M.Eng.
University of Louisville, 2000, 211 pages
1398693

A study of computer-mediated, collaborative architectural design
by Al-Qawasmi, Jamal, Ph.D.
Texas A&M University, 1999, 185 pages
9957383

An examination of the role of screen design and learning condition on computer-assisted second language learning
by Bilan, Bohdan Jens, Ph.D.
University of Calgary (Canada), 1999, 245 pages
NQ38457

Design, development, and pilot testing of a web-based counseling support site for a California community college
by Brown-DiThomas, Deborah Sue, Ed.D.
Pepperdine University, 1999, 128 pages
9953438

The becoming of problems in design: knowledge in action to frame wicked problems
by Buenano, Gilberto, Ph.D.
University of California, Berkeley, 1999, 132 pages
9931195

A process for the design of outdoor health care environments
by Burcher, Lise Marie, M.L.A.
University of Guelph (Canada), 1999, 79 pages
MQ43144

The presence of light: a model for architectural design and criticism
by Caracristi, Paul Joseph, M.Arch.
Daltech-Dalhousie University (Canada), 1999, 117 pages
MQ39641

Issues in the design, choice and timing of fiscal policy rules
by Cebotari, Aliona, Ph.D.
University of Maryland College Park, 1999, 307 pages
9957127

Design variables and the success of outdoor neighborhood recreational facilities (California)
by Chapman, Gary Allen, M.L.Arch.
The University of Arizona, 1999, 303 pages
1395272

Promoting competency development through the design and management of multinational supply chains
by Couch, Christopher E., Ph.D.
Massachusetts Institute of Technology, 1999

The design, development and evaluation of a web-based tool for helping veterinary students learn how to classify clinical laboratory data
by Danielson, Jared Andrew, Ph.D.
Virginia Polytechnic Institute and State University, 1999, 160 pages
9939136

The golf course as a nature reserve: an evaluation of land use and diversity applied to ecosystem design
by Devine, Barry Edward, Ph.D.
University of Rhode Island, 1999, 198 pages

9960021

Three-dimensional virtual worlds and learning: an analysis of the impact of design affordances and limitations in Active Worlds, Blaxxun Interactive, and OnLive! Traveler, and a study of the implementation of Active Worlds for formal and informal education
by Dickey, Michele Dean, Ph.D.
The Ohio State University, 1999, 223 pages
9941313

On energy-based seismic analysis and design of highway bridges
by Dutta, Anindya, Ph.D.
State University of New York at Buffalo, 1999, 724 pages
9918201

Design and implementation of an Internet-based time management system
by Egbert, Lawrence Garth, M.Eng.
University of Louisville, 1999, 70 pages
1396751

An educational program for paper sculpture: a case study in the design of software to enhance children's spatial cognition
by Eisenberg, Ann Naomi, Ph.D.
University of Colorado at Boulder, 1999, 140 pages
9925379

The design and development of a web-based financial bundle trading market
by Fan, Ming, Ph.D.
The University of Texas at Austin, 1999, 107 pages
9959482

Computer automated and integrated design (CAID)
by Farahat, Said, Ph.D.
University of Ottawa (Canada), 1999, 198 pages
NQ46519

Sustainable architecture for the urban elderly: a holistic design strategy
by Farmer, Bonnie Ann, M.E.Des.
University of Calgary (Canada), 1999, 158 pages
MQ47667

Usability evaluation of web page design
by Fu, Limin Paul, Ph.D.
Purdue University, 1999, 196 pages
9951955

In search of paradigms in multimedia systems design: an analysis of software engineering and graphic design approaches using the Kuhnian model

by Gallagher, J. B. Seamus, Ph.D.
Queen's University of Belfast (Northern Ireland), 1999, 332 pages

The healing dimensions of hospital gardens: three case studies assessing the use, therapeutic benefits and design recommendations
by Ghose, Sharmila, M.L.A.
The University of Texas at Arlington, 1999, 95 pages
1396536

The origins of floral-design beadwork in the southern Columbia River plateau
by Grafe, Steven LeRoy, Ph.D.
The University of New Mexico, 1999

Internet-based design/manufacturing process management
by Gu, Hua, M.S.
Michigan State University, 1999, 131 pages
1398600

The design of a web-based distributed Geographic Information System
by Hammerle, Roland Johann, M.C.S.
The University of New Brunswick (Canada), 1999, 173 pages
MQ46254

A comparison of design and performance properties for selected aircraft fabric covering processes
by Hammond, Daryl Irving, Ed.D.
Oklahoma State University, 1999, 95 pages
9942441

Process design in a changing environment: identification of quality demands governing the design process
by Herder, Paulien Minke, Dr.
Technische Universiteit te Delft (The Netherlands), 1999, 213 pages

Indonesian batik design: transmitter of culture
by Hodge, Trish, M.A.
California State University, Dominguez Hills, 1999, 84 pages
1394145

Postsecondary graphic design education in Taiwan using different instructional approaches: a status study
by Huang, Jalin Ko-Tsung, Ed.D.
Indiana University, 1999, 195 pages
9944046

Design coordination modeling: a distributed computer environment for managing design activities
by Jeng, Taysheng, Ph.D.

Georgia Institute of Technology, 1999, 152 pages
9929324

Development of multidisciplinary design optimization procedures for smart composite wings and turbomachinery blades
by Jha, Ratneshwar, Ph.D.
Arizona State University, 1999, 113 pages
9924183

The architecture of orthodox Anglicanism in the antebellum South: the principles of neo-Gothic parish church design and their application in the southern parish church architecture of Frank Wills and his contemporaries
by Joyner, John Edward, III, Ph.D.
Georgia Institute of Technology, 1999, 389 pages
9929326

Systematic design of R&D performance measurement systems
by Kerssens-Van Drongelen, Ingeborg Christine, Dr.
Universiteit Twente (The Netherlands), 1999, 327 pages

A grounded theory of postsecondary faculty design of technology-based instruction as institutional innovation: assimilation and instructional propriospect
by Kovalchick, Ann, Ph.D.
University of Virginia, 1999, 185 pages
9948468

The effect of buyer choice rules on product line design and pricing
by Kraus, Ursula Gabriela, Ph.D.
University of California, Berkeley, 1999, 114 pages
9931291

Designing together apart. Computer-supported collaborative design in architecture
by Kvan, Thomas, Ph.D.
Open University (United Kingdom), 1999

An innovative approach to insurance product design: industrial concepts in insurance
by Leuzinger, Ruth Maria, Drsctech.
Eidgenoessische Technische Hochschule Zuerich (Switzerland), 1999

Talking to text and sketches: the function of written and graphic mediation in mechanical engineering design
by Lewis, Barbara J., Ph.D.
Rensselaer Polytechnic Institute, 1999, 332 pages
9925259

Participant-contingent design decisions: a theory of novice decisions in home acquisition

by Maarttola, Isto Petteri, Dr.Tech.
Teknillinen Korkeakoulu (Helsinki, Finland), 1999, 216 pages

On multibody systems simulation in product design
by Makkonen, Petri, Dr.Techn.
Kungliga Tekniska Hogskolan (Sweden), 1999, 148 pages

Designing the design: a discrepancy evaluation of an educational technology program design and implementation in a community college
by Morgan, Cheryl Ann, Ed.D.
University of San Diego, 1999, 129 pages
9955233

Instructional design practices in selected distance education courses at Texas A&M University: a qualitative case study
by Mortera-Gutierrez, Fernando, Ph.D.
Texas A&M University, 1999, 201 pages
9943542

Management systems for the shop floor: a model-based design methodology
by Moscoso, Philip German, Drsctech.
Eidgenoessische Technische Hochschule Zuerich (Switzerland), 1999, 224 pages

A theory of meaning in architecture and urban design
by Motalebi Esfidvajani, Ghasem, Ph.D.
University of New South Wales (Australia), 1999

Object lessons: household appliance design and the American middle class, 1920–1960
by Nickles, Shelley Kaplan, Ph.D.
University of Virginia, 1999, 477 pages
9916356

The methods of advertisement design in the Libyan companies
by Oun, Salem Mohamed, Ph.D.
Politechnika Wroclawska (Poland), 1999, 168 pages

Adaptive buildings through evolutionary design: towards more sustainable buildings. Project design process as a complex adaptive system
by Pagani, Freda Rosevere, Ph.D.
The University of British Columbia (Canada), 1999, 188 pages
NQ38952

An evolutionary based methodology for representing and evolving structural design solutions
by Raich, Anne Marie, Ph.D.
University of Illinois at Urbana-Champaign, 1999, 215 pages
9921723

Designing for lifeworlds: genre and activity in information systems design and evaluation
by Spinuzzi, Clay Ian, Ph.D.
Iowa State University, 1999, 299 pages

Dress, furnishings and interiors, c1910–1918, Minneapolis, Minnesota: exploring design relationships in the context of the Purcell-Cutts House
by Trautmann, Julianne, Ph.D.
University of Minnesota, 1999, 650 pages
9947009

Sound design and science fiction
by Whittington, William Brian, Ph.D.
University of Southern California, 1999, 338 pages
9933802

Students and the design education experience: an exploration on the nature of social interaction in a design school
by Woolham, Amanda Ruth, MLA
University of Guelph (Canada), 1999, 73 pages
MQ43239

A theory of product design process measurement
by Wright, Alan Louis, Ph.D.
Oregon State University, 1999, 292 pages
9954877

An integrated curriculum model for industrial design programs at the undergraduate level
by Yeh, Wen-Dih, Ph.D.
The University of Wisconsin–Madison, 1999, 491 pages
9923230

Business jacket design: preferences of working women
by Yoo, Seulhee, Ph.D.
Texas Tech University, 1999, 170 pages
9951560

Cognitive processes in iterative design behavior
by Adams, Robin Sue, Ph.D.
University of Washington, 2001, 337 pages
3014053

Reforming Arabic calligraphy: for computer art and design in Kuwaiti art education
by Alnajdi, Khaled Abdullah, Ph.D.
The Pennsylvania State University, 2001, 408 pages
3014584

Cognitive biases in design: the case of tropical architecture
by Bay, Joo-Hwa, Ph.D.
Technische Universiteit Te Delft (The Netherlands), 2001, 268 pages

Venture design, scalability and sustained performance
by Bergin, Richard Jeffrey, DBA
Harvard University, 2001, 162 pages
3004729

By design: the FEC. The Federal Election Commission and regulatory decision-making as a constrained bargaining process
by Bordner, Bruce Carl, Ph.D.
University of Virginia, 2001, 301 pages
3008888

"Your cell will teach you all things": the relationship between monastic practice and the architectural design of the cell in Coptic monasticism, 400–1000 (Egypt)
by Brooks Hedstrom, Darlene Lynn, Ph.D.
Miami University, 2001, 310 pages
3018767

Educational software designers: what do they think about good design?
by Chen, Huiping, Ph.D.
Kansas State University, 2001, 134 pages

Multi-sensory user interface for virtual reality based computer aided design system
by Chu, Chi-Cheng, Ph.D.
The University of Wisconsin–Madison, 2001, 167 pages
3012542

The design and facilitation of asynchronous discussion activities in web-based courses: implications for instructional design theory
by Dennen, Vanessa Paz, Ph.D.
Indiana University, 2001, 354 pages
3005472

Architecture design and mapping of DSP systems
by Gao, Lijun, Ph.D.
University of Minnesota, 2001, 138 pages
9999324

Platform design for customizable products as a problem of access in a geometric space
by Hernandez, Gabriel, Ph.D.
Georgia Institute of Technology, 2001, 361 pages
3015655

Optimal conceptual design of high-rise office buildings
by Khajehpour, Siavash, Ph.D.
University of Waterloo (Canada), 2001, 191 pages
NQ60544

A methodology for technology identification, evaluation, and selection in conceptual and preliminary aircraft design
by Kirby, Michelle Rene, Ph.D.
Georgia Institute of Technology, 2001, 234 pages
3004551

The eXtreme Design approach
by Kobler, Adrian, Drsctech
Eidgenoessische Technische Hochschule Zuerich (Switzerland), 2001, 148 pages

Role of information in design review: a case study
by Kumar, Sandeep, Ph.D.
University of Illinois at Urbana-Champaign, 2001, 189 pages
3017134

Adapting CAD and visualization skills learned through AutoCAD RTM to an industrial apparel design system
by Mathur, Deepti, M.Sc.
The University of Manitoba (Canada), 2001, 132 pages
MQ57556

Federal politics and regional institutions: electoral system design in Russia's regions
by Moraski, Bryon James, Ph.D.
The University of Iowa, 2001, 193 pages
3009621

Effects of worker anthropometry and workplace design upon shoulder discomfort and task productivity
by Pabon-Gonzalez, Miriam, Ph.D.
University of Massachusetts Amherst, 2001, 163 pages
3000329

An object oriented approach towards spatial aggregation: the design, utilization, and evaluation of the Spatial Aggregation Modeling Engine (S.A.M.E.)
by Patterson, Paul Edward, Ph.D.
University of Pennsylvania, 2001, 171 pages
3003677

Design and performance analysis of a virtual reality-based telerehabilitation system
by Popescu, George Viorel, Ph.D.
Rutgers the State University of New Jersey–New Brunswick, 2001, 162 pages
3000852

Case-based reasoning in knowledge-based CAAD: modeling case representation for architectural design reuse
by Raduma, Paul, D.Tech.
Teknillinen Korkeakoulu (Helsinki, Finland), 2001, 345 pages

Design for environment: a method for formulating product end-of-life strategies
by Rose, Catherine Michelle, Ph.D.
Stanford University, 2001, 169 pages
3000092

A virtual reality interface design (VRID) model and methodology
by Tanriverdi, Vildan, Ph.D.
Tufts University, 2001, 117 pages

Web-based integrated medical information system for primary care physicians, students of medicine, and medical device design
by Tsai, Mark Ching-feng, Ph.D.
Stanford University, 2001, 106 pages
3002053

A methodology for robust structural design with application to active aeroelastic wings
by Zink, Paul Scott, Ph.D.
Georgia Institute of Technology, 2001, 282 pages
3015703

Design simplification by analogical reasoning
by Balazs, Marton Erno, Ph.D.
Worcester Polytechnic Institute, 2000, 315 pages
9953994

Designing nature: evaluating the design process for the natural history interpretation of the Northern Forest section at the Calgary Zoo (Alberta)
by Barnes, Valerie Frances, M.E.Des.
University of Calgary (Canada), 2000, 149 pages
MQ48243

Toward a valid disc golf course design algorithm: using landscape ecology and geographic information systems (GIS) to assess recreation facilities' sites
by Benson, Jerome Edward, II, M.S.
Stephen F. Austin State University, 2000, 108 pages
1398522

Evaluation of web-based instruction in interior design education: a pilot study
by Blair, Katherine Nora, M.A.
Eastern Michigan University, 2000, 108 pages
1397955

Information representation and constraint satisfaction for the domain mapping process of product design
by Chen, Li-Chieh (Jason), Ph.D.
State University of New York at Buffalo, 2000, 186 pages
9958249

Components in the design and implementation of an organizational vision
by Chorpenning, David W., Ph.D.
Walden University, 2000, 132 pages
9959018

A distributed design process and agent protocol for multidisciplinary optimization
by D'Ambrosio, Joseph Gerard, Ph.D.
The University of Michigan, 2000, 234 pages
9963764

Design and fabrication of a diffractive bar code scanner
by Gelbart, Asher, M.S.
The University of Arizona, 2000, 168 pages
1398917

Britain by design: industrial culture, imperial display, and the making of South Kensington, 1835–1872 (England)
by Kriegel, Lara, Ph.D.
The Johns Hopkins University, 2000, 328 pages
9950559

Design and control of automated guided vehicle systems
by Lee, Chulung, Ph.D.
The Pennsylvania State University, 2000, 209 pages
9966843

A critical evaluation of Jesse James Northcutt's homiletical design in comparison to Augustine's instruction as exemplified in "De Doctrina Christiana"
by Lee, Phillip Endel, Jr., Ph.D.
Southwestern Baptist Theological Seminary, 2000, 365 pages
9968726

The effects of map iconography and design on map recognition and retention
by Lichtenwalter, Todd Michael, M.S.F.
Stephen F. Austin State University, 2000, 123 pages
1398749

Optimization methods for alternative energy system design
by Reinhardt, Michael Henry, D.Eng.
University of Lowell, 2000, 205 pages
9963243

Product assurance index: an integration of maintenance, reliability and quality criteria into product design
by Robinson, Paul Erich, Ph.D.
University of South Florida, 2000, 335 pages
9968832

The computer-aided design and manufacture of complexly shaped metal architectural frame structures
by Rotheroe, Kevin Chaite, D.Des.
Harvard University, 2000, 264 pages
9960016

Property crime in townhouse developments: an assessment of physical design and crime rates
by Bassanese, Sandro, M.L.A.
University of Guelph (Canada), 1999, 95 pages
MQ43137

Environment, ethics, and design: an inquiry into the ethical underpinnings for a contemporary Muslim environmentalism and its environmental design implications (Saudi Arabia)
by Ba-Ubaid, Ali Yeslam, Ph.D.
University of Pennsylvania, 1999, 421 pages
9953502

Green design and manufacturing decisions: a case study in ground surfaces
by Bauer, Diana Jean, Ph.D.
University of California, Berkeley, 1999, 162 pages
9966300

Predicting unpredicted happenings in complex instructional design projects
by Beal, Mary C., Ed.D.
Oregon State University, 1999, 185 pages
9944730

Thai temple architecture: symbolism, history, and design
by Box, Micah, M.A.
California State University, Dominguez Hills, 1999, 76 pages
1394141

The everyday design of service: a single case study of the Soft Center reception area
by Brimdyr, Kajsa Cadwell, Ph.D.
The Union Institute, 1999, 296 pages
9943167

Augmenting interface: investigating digital design and architecture
by Checkwitch, Benjamin, M.Arch.

Daltech-Dalhousie University (Canada), 1999, 41 pages
MQ39642

The Times Beach area: environmental ethics and the design of place in Buffalo, New York
by Cheeley, Willow Anya, M.L.A.
State University of New York Col. of Environmental Science & Forestry, 1999, 163 pages
1398042

The relationships between cultural differences among American and Chinese university students and the design of personal pages on the World Wide Web
by Chu, Gia-Li, Ph.D.
University of Georgia, 1999, 304 pages
9949487

Living with multiple disabilities: design for adult day program facilities
by Claney, Anita E., M.S.
The University of Arizona, 1999, 193 pages
1398037

Methodology for the design of economical and environmental friendly processes: an uncertainty approach
by Dantus Litwak, Mauricio Marcos, Ph.D.
Oklahoma State University, 1999, 306 pages
9942429

Demand at first sight: the Centennial of 1876 as a catalyst for the consumer revolution in American interior design, 1876–1893
by Davis, Gainor Buckingham, Ph.D.
Temple University, 1999, 405 pages
9938658

System design framework for a learning collaboratory
by Dorneich, Michael Christian, Ph.D.
University of Illinois at Urbana-Champaign, 1999, 334 pages
9944836

Manufacturing speed: a factory for the design of the Formula One race car
by Dow, Kirsten Therese, M.Arch.
University of Calgary (Canada), 1999, 77 pages
MQ42328

The design and development of HELPER, a constructivist lesson plan web resource to model technology integration for teachers
by Driskell, Trudy Lynn, Ed.D.
University of Houston, 1999, 305 pages
9929269

Semi-automated linking of user interface design artifacts
by Elnaffar, Said Selim, M.Sc.
Queen's University at Kingston (Canada), 1999, 129 pages
MQ42610

Activity-based life cycle assessments in design and management
by Emblemsvag, Jan, Ph.D.
Georgia Institute of Technology, 1999, 600 pages
9939859

Team design and performance: a study of short-term entrepreneurial teams
by Foo, Maw-Der, Ph.D.
Massachusetts Institute of Technology, 1999

Automobile instrument panel design: reach capabilities of younger and older drivers
by Formosa, Daniel John, Ph.D.
New York University, 1999, 98 pages
9956672

Impact of a family-centered-care approach on the design of neonatal intensive-care units
by Fournier, Marie-Andree, Ph.D.
Texas A&M University, 1999, 292 pages
9943483

A three-dimensional computer model of human back contours for automotive seat design
by Frost, Barry Lewis, III, M.S.
Michigan State University, 1999, 85 pages
1398595

Design and evaluation for the effectiveness and efficiency of new technologies in education
by Henderson, Thomas Wynne, Ph.D.
Washington State University, 1999, 69 pages
9960827

Interorganizational coordination in container transport: a chain management design
by Hengst-Bruggeling, Marielle Den, Dr.
Technische Universiteit Te Delft (The Netherlands), 1999, 272 pages

Multidisciplinary design optimization of aircraft wing structures with aeroelastic and aeroservoelastic constraints
by Jung, Sang-Young, Ph.D.
The University of Oklahoma, 1999, 222 pages
9914421

A goal-oriented design evaluation framework for decision making under uncertainty
by Kim, Jun Beom, Ph.D.
Massachusetts Institute of Technology, 1999

Disciplined design capture and evolution of object-oriented systems
by Kim, Jung Jae, Ph.D.
Northwestern University, 1999, 179 pages
9953308

Social ecology and environmental psychology as applied to the design and renovation of American university campuses
by Krumwiede, Robert William, Ph.D.
University of Minnesota, 1999, 140 pages
9950297

Acoustic modeling and design of MRI scanners
by Kuijpers, Adrianus Henricus Wouterus Maria, Dr.
Technische Universiteit Eindhoven (The Netherlands), 1999, 148 pages

Internet-based collaborative design evaluation: an architect's perspective
by Lee, Sanghyun, Dr.Des.
Harvard University, 1999, 193 pages
9919735

Planning and design of the urban park: a study of use patterns at Fort Lowell Park and the creation of new design guidelines for park development in Tucson, Arizona
by Longaker, Robert George, III, M.L.Arch.
The University of Arizona, 1999, 139 pages
1395267

Design and development of a pack system for portable GPS devices
by Luoma, Vivian Irene, M.E.Des.
University of Calgary (Canada), 1999, 84 pages
MQ48241

William Dunlap and the construction of an American art history: a study of the "History of the Rise and Progress of the Arts of Design in the United States" (1834)
by Lyons, Maura, Ph.D.
Boston University, 1999, 234 pages
9915602

The public's opinion of architecture, interior decoration, and interior design
by Martin, Caren Samter Iverson, Ph.D.
University of Minnesota, 1999, 237 pages
9952336

The Architectural Oracles Game: a Futures Tool for architecture and design
by Munski, Mary-Margaret, Ph.D.
The University of Michigan, 1999, 254 pages
9929907

A knowledge-based concept exploration model for submarine design
by Nat, Clemens Gerardus Johannes Maria Van Der, Dr.
Technische Universiteit Te Delft (The Netherlands), 1999, 244 pages

Design of alpine skis
by Nordt, Alison Audrey, Ph.D.
Stanford University, 1999, 185 pages
9924594

Sourcing by design: product architecture and the supply chain
by Novak, Sharon, Ph.D.
Massachusetts Institute of Technology, 1999

Building community: design in the organizational mind
by Press, B. Joseph, Ph.D.
Massachusetts Institute of Technology, 1999

Multi-user and environmental golf course architecture: a process for design evaluation
by Rinaldi, John Giovanni, M.L.A.
University of Guelph (Canada), 1999, 134 pages
MQ43210

Formalizing negotiation in engineering design
by Scott, Michael Joseph, Ph.D.
California Institute of Technology, 1999, 171 pages
9916171

The effect of product design and packaging parameters on effective storability and retrieval: a computer-based approach
by Srivatsavan, Srinath, Ph.D.
West Virginia University, 1999, 235 pages
9927865

Theoretical model for apparel design curriculum: fit satisfaction, body cathexis, and creativity
by Swearingen, Elizabeth, M.S.
California State University, Fresno, 1999, 154 pages
1396054

The analyzable product model representation to support design-analysis integration
by Tamburini, Diego Romano, Ph.D.

Georgia Institute of Technology, 1999, 626 pages
9939894

A roadmap for decomposition: activities, theories, and tools for system design
by Tate, Derrick, Ph.D.
Massachusetts Institute of Technology, 1999

Evaluation of multidisciplinary design optimization techniques as applied to the spacecraft design process
by Taylor, Ellen Riddle, Ph.D.
University of Colorado at Boulder, 1999, 187 pages
9955325

Improving design and development productivity of tugboat shipbuilding: a computer simulation approach
by Tejpal, Navin, M.Eng.
Daltech-Dalhousie University (Canada), 1999, 105 pages
MQ48290

Design potential concept for reliability-based design optimization
by Tu, Jian, Ph.D.
The University of Iowa, 1999, 152 pages
9957334

TEXPERT: expert system for evaluating product design for worker's safety and health
by Venneti, Vikram V., M.S.
West Virginia University, 1999, 161 pages
1399069

Metrics for the design of visual displays of information
by Yang-Pelaez, Julie Anshun, Ph.D.
Massachusetts Institute of Technology, 1999

Design process management for engineering conceptual design
by Zuo, Jingyan, Ph.D.
Carnegie-Mellon University, 1999, 176 pages
9964626

Decision support technique for sustainable community design: developing a sustainable community design evaluation methodology
by Afolayan, Samuel Sunday, Ph.D.
The University of Manitoba (Canada), 2001, 270 pages
NQ57500

Pedestrian injuries and vehicle type and design in Maryland, 1995–1999
by Ballesteros, Michael Francisco, Ph.D.
University of Maryland at Baltimore, 2001, 129 pages

3007932

The development of artists at Rhode Island School of Design
by Bekkala, Elsa, Ed.D.
Columbia University Teachers College, 2001, 293 pages
3014747

Social factors in the design and use of computer-mediated communication technology
by Bradner, Erin Marie, Ph.D.
University of California, Irvine, 2001, 217 pages
3006992

Development and application of tools for structure-based library design
by Burdick, Keith William, Ph.D.
University of California, San Francisco, 2001, 210 pages
3009783

A history of costume design for the Big Apple Circus from 1985 to 1998
by Burnstine, Andrew Phillips, Ph.D.
New York University, 2001, 198 pages
3004902

Remediation and the visual evolution of design
by Cooke, Lynne Marie, Ph.D.
Rensselaer Polytechnic Institute, 2001, 223 pages
3017743

Quotient construct, inscriptional practices and instructional design
by de Silva, Teruni Asha, Ed.D.
Arizona State University, 2001, 301 pages
3016016

Design, sensing and control of a robotic prosthetic eye for natural eye movement
by Gu, Jianjun Jason, Ph.D.
University of Alberta (Canada), 2001, 183 pages
NQ60293

Constructive learning in the digital labyrinth: hypertext design experiences in web-based environments
by Huang, Hsi-chi, Ph.D.
The Ohio State University, 2001, 188 pages
3011075

3D city modeler with fuzzy multiple layers perceptron: application of soft computing in computer aided architectural design systems
by Kobayashi, Yoshihiro, Ph.D.
University of California, Los Angeles, 2001, 192 pages

9998995

Design for human comfort outdoors in cold climates, with specific reference to Winnipeg transit stops (Manitoba)
by Kok, Wing Sze Vince, M.L.Arch.
The University of Manitoba (Canada), 2001, 136 pages
MQ57550

Rebirth of a neighborhood: in streetscape design (Florida)
by Lozada, Itzel, M.Arch.
Florida International University, 2001, 74 pages
1403694

Architecture and design of Internet-based medical management information systems
by Mayberry, Austin Charles, M.Eng.
University of Louisville, 2001, 81 pages
1403392

Interior designers' computer applications in professional practice: implications for interior design education
by Nawrocki, Selena Celeste, Ph.D.
Mississippi State University, 2001, 144 pages
3005596

A framework for the personalized public transit network design
by Pashaie-Avval, Behruz, Ph.D.
The University of Texas at Arlington, 2001, 198 pages
3010046

A survey of U.S. railway safety based on accident data reported to Federal Railway Administration over a ten year period with a comparative analysis to a Federal Aviation Administration airplane design safety target
by Pickett, Stephen James, M.S.
California State University, Dominguez Hills, 2001, 40 pages
1403832

A methodology for the evaluation of product design in environmentally conscious manufacturing
by Rivera Becerra, Alejandro, Ph.D.
State University of New York at Buffalo, 2001, 261 pages
9997993

A cognitive framework for an urban environment design tool
by Sidjanin, Predrag, Ph.D.
Technische Universiteit Te Delft (The Netherlands), 2001, 415 pages

An investigation of instructional design models for web-based instruction

by Sun, Xiangqing, Ph.D.
The University of Toledo, 2001, 141 pages
3004521

The design and fabrication of a full-suspension bicycle using fiber-reinforced composite leaf springs and integrated viscoelastic damping
by Thompson, Gregg Michael, M.E.
The Cooper Union for the Advancement of Science and Art, 2001, 82 pages
1403683

R2D2 goes to work: the design and development of a first-year art foundations course
by Wright-Evans, Kristen Mary, Ph.D.
Iowa State University, 2001, 148 pages
3003281

The Virtual Gallery 2.0 framework: design plan for digital exhibit curating
by Zirkel-Rubin, Jessica Beth, Ed.D.
Columbia University Teachers College, 2001, 193 pages
3014800

Appendix G: Dissertation Projects at the Illinois Institute of Technology

(as of May 30, 1999)

The following list of dissertation projects was copied verbatim from the website of the Illinois Institute of Technology, which has the oldest Ph.D. program in design in the United States (IIT 2001).

Intelligibility in hypermedia communication

Doctoral Researcher: Peter Storkerson

Advisors: Sharon Poggenpohl (ID), Greg Prygrocki (ID), Jay Wolke (ID), Robert Schleser (Psychology)

Estimated Date of Completion: 12/99

Full abstract:

> This project builds a theory of intelligibility for hypermedia communications. The notion "intelligibility" addresses a class of vaguely defined symptoms indicating a general breakdown of communication which hinders involvement, interaction, interpretation and comprehension. Despite the importance of intelligibility to communication, intelligibility problems remain poorly understood in communication design.
>
> The dissertation develops and demonstrates a theory of hypermedia communication: of what can be communicated and how. It is based not on messages, but on the interpretive challenges and the resources of perceivers. It is a rhetorical theory of how communication builds knowledge in the world of experience. It is based on three theses: knowing is a phenomenological state or experience that can be produced by a communication, the production can be decomposed into procedures, and by working according to those procedures we can stabilize interpretation and comprehension across a population of individuals.
>
> Because hypermedia integrates texts, images, sounds, and behaviors, we need to integrate language and symbols, perceptual characteristics and behaviors into a single model of learning or cognitive change. Classical theories of rhetoric formulate a

model on the symbolic level and establish an epistemology that includes both the testing and what it tests. Perceptual issues concern the tangible aspects of interpretation: depiction, argument, metaphor and credibility. Behavior concerns the communicative situation as a social setting which conditions behavior and interpretation. Cognition is the process by which we as perceivers combine these elements into entities which feel tangible to us, and which we grasp and remember.

These levels operationalize the theory into a set of discrete variables which can be tested. The dissertation will build a test using a hypermedia communication which manipulates presentational variables and tests their relevance to cognition as memory, depth of comprehension, and interpretation.

"User-centered" design thinking: user research and its operational implications for design problem solving activity

Doctoral Researcher: Jay Melican

Advisors: Sharon Poggenpohl (ID), Eli Blevis-Bal (ID), Christena Nippert-Eng (Sociology)

Estimated Date of Completion: 12/99

Full abstract:

In an attempt to develop better understandings of the users of their products and the contexts in which those products will exist and function, designers have looked of late to the social sciences for guidance and support; more specifically, they have looked to social and behavioral research methods. It is no longer unusual for "design activities" to include research into human cognitive capacities, into the forces that shape or help determine human behavior, into consumers' habits and daily routines, or into residents' conceptual models of their built environments. For many design practitioners, these developments constitute a radical redefinition of their professional activities. Designers commonly find themselves working on project teams that have taken on a new and unfamiliar profile. These teams are multidisciplinary, drawing expertise from a number of disciplines, and often include social researchers in addition to designers and engineers or other implementation specialists. Each discipline brings its own unique perspective and offers valuable insights, but communication across disciplines can be problematic.

This research project examines the role and meaning of a concept of "user-centeredness" in the professional community. As a philosophical position or approach to design, this focus on the user is most clearly manifested in the selection of methods that designers or design teams choose to apply in problem solving episodes. Using protocol analysis techniques to observe design teams in action, an assessment is made of how designers use information from and about "users" in design problem solving activities.

A system framework for screening innovation ideas

Doctoral Researcher: Ding-Bang Luh

Advisors: John Heskett (ID)

Estimated Date of Completion: 5/99

Full abstract:

Creative ideas, original solutions to problems, and new products or services are essential to business organizations and a key ingredient for success. New products come from innovative product ideas. The selection of product ideas, therefore, directly affects the prosperity of a company. Despite modern concepts, technologies and equipment having been developed and introduced in most aspects of manufacturing, the failure rate of new products (around 45%) has shown little or no improvement since the 1960s. Through studies of industrial success curves and

related innovation and screening processes, a critical stage for idea screening is identified. A lack of user's perspective, limited external references, and the exclusion of latent design contribution, in the idea screening process, are identified as major hurdles for success rate improvement.

To more clearly establish user's perspective, an innovation typology that maintains symmetry in the perspectives of maker and user is developed. Based on which, innovation profiles, qualitative representations of an idea that consist of innovation dimensions and dimension status, are developed. Both makers and users, in general, are idea adopters, which requires examinations of innovation adoption and diffusion processes. Major influential factors are identified and attributes of innovation and of adopter are analyzed. The innovation attributes can be used as a framework for verification of the proposed innovation profiles. Through competitiveness analysis (for ranking) and with adopter attributes (for weighting), the innovation profiles can be expressed quantitatively, which facilitates the establishment of external references for idea screening. By carefully sampling new product cases in history, success/failure probability curves are established. Accordingly, objective probabilities of an idea can be estimated in an early stage. To avoid bias to ideas of different natures, a reconfirmation process that takes latent design contributions of an idea into account is also suggested.

Design competency evolution model: examination of design competencies based on the co-evolutionary analysis of design and industries influenced by the advancement of technology

Doctoral Researcher: Jooyun Melanie Joh

Advisors: John Heskett (ID)

Estimated Date of Completion: none given

Full abstract:

Design became an important part of everyday life with the Industrial Revolution and prospered in the twentieth century industrial society based on mass manufacturing. However, times are changing and design is faced with a dilemma of defining its own boundaries, as it becomes more and more a participatory effort, involving diverse professionals and stakeholders. While design is becoming more complex with inputs from outside of design, it is struggling to find a way to define its domain in its own terms. Perhaps it is time for design to extend its boundaries, using its distinctive abilities, to focus on where it is needed for the future.

Throughout history, design always has been involved in both utilitarian and symbolic functions. In the beginning, design was perceived in a decorative role to enhance product quality and symbolic status. Since the Industrial Revolution, design has been closely related to manufacturing, presenting technology in forms capable of selling products. What now makes it necessary for design to change again is the impact of intangible assets. What was considered design's traditional role in developing and manufacturing products now needs to be adapted to the emergence of the Information Society, where the invisible intellectual capital is considered more valuable than visible tangible products. A product cannot stand alone without service, in other words, the information that surrounds all aspects of the product. A service has no meaning without a fundamental product or until a service takes on a form of a product. Therefore, design must be able to encompass all aspects of product and service development for it to prove valuable in the future.

The design competency evolution model is an attempt to lay the groundwork for the design profession to actively and deliberately articulate and expand design competencies to contribute to better establishing the design profession in the present and the future. This research examines design as a profession that develops and expands its capabilities constantly to validate the existence of the profession. Evo-

lution of design profession will be documented by the capabilities design had in the past and what they are currently. By looking at design's evolution with the emphasis in design competencies, the conclusion will suggest the future direction for the design profession.

Design case study methods

Doctoral Researcher: Izabel Falcao Barros

Advisors: John Heskett (ID)

Estimated Date of Completion: none given

Full abstract:

The research is concerned with establishing frameworks that facilitate the accumulation of information regarding decision-making, design process, the integration of design strategies with business strategies in a case study format that specifically serves design. The nature of evidence in this method is of considerable importance and the relationship to accumulating and transferring knowledge is also a significant dimension of this work.

Evolutionary structured planning: a computer-supported methodology for the conceptual planning process

Doctoral Researcher: Charles Bezerra

Advisors: Chuck Owen (ID)

Estimated Date of Completion: none given

Full abstract:

This research considers the application of evolutionary computation techniques to contemporary planning processes. With origins in morphological analysis, structured planning, and genetic algorithms, the investigated computer-supported methodology represents a new way for dealing with compound solution concepts in large combinatorial solution spaces. Since the source of values for decisions in design comes not only from the artifactual world (objective, quantitative data) but also from the world of culture (subjective, qualitative data), the processes investigated are interactive, collaborative methods integrating the best of human insight and cooperation with the best of computer power.

Implementation of cultural human factors in product design

Doctoral Researcher: Kyung Ran Choi

Advisors: Kei Sato (ID)

Estimated Date of Completion: none given

Full abstract:

None available to view at this time.

Experiential design and rational design: outputs as evidence of two different types of cognitive processes in creative problem-solving

Doctoral Researcher: Luis Quental Medeiros Pereira

Advisors: Sharon Poggenpohl (ID)

Estimated Date of Completion: none given

Full abstract:

Departing from a speculative position that cognitive processes can operate both with past experience representations or memorized symbols, the outputs from the design process may be able to reveal which cognitive level was used in each stage of the process. Two initial research hypotheses are established: 1) design solutions are

"generated" at an experiential level through sensorial simulation yielding tangible outputs, while 2) problem setting happens at a symbolic level through verbalized outputs.

Use of social methods in design

Doctoral Researcher: Roberto Holguin

Advisors: John Grimes (ID)

Estimated Date of Completion: none given

Full abstract:

None available to view at this time.

Knowledge lifecycle for user-centered product development

Doctoral Researcher: Sakol Teeravarunyou

Advisors: Keiichi Sato (ID)

Estimated Date of Completion: none given

Full abstract:

The increasing complexity of the market, technology and economic environment addresses the issue of capturing and reflecting user needs in the design of artifacts. The goal of this research is to form a framework for the cycle of knowledge that seamlessly bridge users' knowledge and designers' knowledge in the product lifecycle. First, a method for eliciting knowledge of use that emerges in the process of product use is introduced. Second, a mechanism of developing effective product architecture is proposed to provide a structure for accommodating knowledge elicited through the product lifecycle in order to respond to the diverse and dynamically changing user needs and technological conditions.

In identifying knowledge of use, objects related to the task process are used as media for eliciting what users explicitly and implicitly know about the execution of the task. This method, Object-Based Knowledge and Needs Elicitation Method, has been implemented as software to support user studies both for on-site and internet-based remote modes.

Design methodology for developing product architecture will be composed to best accommodate the mechanism of generating and sustaining the cycle of users' knowledge and designers' knowledge along the product lifecycle. The concept of knowledge-based product architecture will enable industries to establish user-centered product development for responding to the wide range of local needs and fast changing technological and market environments.

Design knowledge and business opportunities

Doctoral Researcher: Jose Carlos Teixeira

Advisors: John Heskett (ID)

Estimated Date of Completion: none given

Full abstract:

The research focuses on the mechanisms by which design knowledge in understanding "how" and "why" users interact with products can contribute to organizational knowledge to identify new business opportunities. The research proposes two processes through which design knowledge can achieve this: 1) by researching existing user needs, desires and expectations to identify opportunities to improve existing business; and/or 2) it can help to "discover" innovative business opportunities through the analysis of user values and behavior to develop products that offer a new value proposition for users.

Frames and insights: the bridge between user-research and design planning

Doctoral Researcher: Praima Chayutsahakij

Advisors: Sharon Poggenpohl (ID)

Estimated Date of Completion: none given

Full abstract:

Design today deals with complex issues. To generate design innovation, matching new needs with new technology, design teams need effective design planning to save time and effort in the design process by focusing the act of design on the important issues and making the design team more cohesive. Efficient design planning offers benefits on many levels from design processes, to business competency, to organizational development. Thus, it pays to do a thorough job of goal setting.

Design planning is the process of defining the scope, nature, and direction of a design solution. There is a global trend away from the group towards the individual. The needs of each particular individual are what is both being catered to and driving our economy and culture. The only way businesses can stay ahead is by understanding the user's desires and then delivering experiences that the user values. That is why user-research is essential for design planning. User-research is the process of examining what users need functionally, economically, spiritually, and symbolically. By collecting the right kind of information efficiently, it identifies important aspects of the design problem and uncovers insightful user-centered needs.

One big problem we are facing is the missing link from user-research to design planning. "Frames and Insights," which are the processes of analyzing and using the information to guide the search for design solutions, provides an explicit basis for assessing suitability, in order to identify goals to achieve, problems to eliminate, assets to preserve, and opportunities to exploit.

This dissertation examines the role, the process and the effects of "Frames and Insights" in design planning. By better understanding how user-research frames facilitate design planning insights, design teams are able to select suitable approaches for their projects. This understanding also holds promise for developing new insights facilitating approaches, and tools for the design community.

Motion as an instrument for navigation in interactive media

Doctoral Researcher: Chujit Jeamsinkul

Advisors: Sharon Poggenpohl (ID)

Estimated Date of Completion: none given

Full abstract:

Navigation is one of the essential keys in designing interactive media. People navigate from one place to another by using perception, cognition, and memory to process information, to create the connection between places, and make path decisions. In order to orient themselves, people need to have a notion of their current location related to the whole structure, such as "Where am I?", "Where and how can I go?", "Where have I been?", "How can I get back to where I once was?" To facilitate user navigation process, a well-designed navigation system is needed.

Time is the crucial dimension for navigating through space in interactive media. From all sensory modes, motion is the one that helps the user to perceive a change of time. Not only can motion represent the change over time of status, feedback, and cues related to user control and response, but motion has a sense of dynamic that can enhance user experience in terms of freedom and flexibility of movement based on specific goal, intention, cognition, and preference. Consequently, motion is a promising instrument for navigation in interactive media, if designers use it effectively and structurally.

This dissertation will concentrate on the effectiveness of motion functions that go beyond aesthetics, excitement, or attractiveness to contemplate what meaning motion can signal in navigation in terms of affordance and cognition. The theory of cognitive motion in navigation through interactive media will be generated from analyzing and synthesizing empirical studies in two areas: affordances of motion in navigation and the effects (meaning) of each type of motion to users. This theory can assist designers in understanding a language of motion that will aid in the development of a systematic approach to navigation.

Modeling interface design for complex information in a cross-cultural setting

Doctoral Researcher: Napawan Sawadichai

Advisors: Sharon Poggenpohl (ID)

Estimated Date of Completion: none given

Full abstract:

As communication has shifted from print-based media to the digital realm, design principles for information structure and display have been developed in order to serve the nature of the new media. Some of these principles are modified from old print-based ones; others are newly developed. However, most of these theoretical and practical studies have been done in terms of making the information applicable and legible for viewers. Not much research has been done with regard to the viewer's purposes or to match the use to which the information will be put.

As a result, this dissertation will focus on a user-centered approach to information design in digital media. The research will involve the investigation of information structure and information display, visual representations, affordances of variables used in multimodal communication, navigation methods, human perception and cognition. The goal of the research is to explore an alternative way for structuring and presenting information in order to better serve the viewer's purposes and help to enhance the viewer's experience of perceiving information through the digital media.

Modeling design knowledge for user-centered interactive system design

Doctoral Researcher: Youn-kyung Lim

Advisors: Keiichi Sato (ID)

Estimated Date of Completion: none given

Full abstract:

There have been various researches on design knowledge and user knowledge in human-computer interaction (HCI), but not significant achievement on bridging those two kinds of knowledge. The research of user knowledge by cognitive theories, psychology, artificial intelligence (AI), or anthropological research, while actively going on, have not provided effective connections to the design knowledge. Increasing complexity on the interactions between human and system and the lack of a well-structured framework of design knowledge to accommodate the diversity of design concerns contribute to this missing connection. In this dissertation research, representation methods of design knowledge required to describe, analyze, design prototypes and evaluate interactive systems will be developed. The framework will support understanding how the relationships among design knowledge elements are related to the user knowledge so as to evaluate and generate design concepts based on that connection. There are three important areas in this research: 1) the design process and thinking patterns in human-computer interaction design (HCI) to specify the roles of the elements of design knowledge and the relations among the domains of the elements; 2) the framework of design knowl-

edge that accommodates different forms and formats; and 3) cognitive theories, affordance, and metaphor to identify and categorize user knowledge.

Appendix H: Survey of Design-Related Programs at Other Institutions

This appendix presents basic information about design-related programs at selected U.S. colleges and universities. "Design-related" includes architecture; landscape architecture; urban design and urban planning; graphic design; visual design; communications design; industrial design; product design; spatial design; interaction design; design studies; etc. Not considered design-related for this survey were the visual arts (photography; sculpture; painting; or printmaking). A college or university was included in the survey if it offers graduate study in design or is an institution with a prominent academic design or architecture program.

The survey results are presented below. California institutions are listed first, in alphabetical order by the name of the institution, followed by other U.S. colleges and universities. The key to the abbreviations following the institution name is:

- AAU — Institution is a member of the Association of American Universities
- NAAB — Institution is accredited by the National Architectural Accrediting Board
- NASAD — Institution is accredited by the National Association of Schools of Art and Design
- Private — Institutional control is private
- Public — Institutional control is public
- UC8 — Institution is one of the eight benchmark universities (4 private and 4 public) used by the University of California for statistical comparisons (the "Comparison 8")

Academy of Art College (San Francisco, CA) **NASAD/Private**

Degrees Offered:
- B.F.A. (graphic design; industrial design; interior architecture and design)
- M.F.A. (architecture; graphic design; industrial design; interior architecture and design)

Students:
- Information not available

Faculty:
- Information not available

Degrees Granted:
- Information not available

References:
- Institutional website (retrieved October 2002): http://www.academyart.edu

Art Center College of Design (Pasadena, CA) **NASAD/Private**

Degrees Offered:
- B.F.A. (graphic design)
- B.S. (environmental design; transportation design; product design)
- M.F.A. (industrial design and media design)

Students:
- Headcounts as of 2001,
  - 580 undergraduates, 93 masters

Faculty:
- Headcount as of 2001,
  - 152 faculty

Degrees Granted:
- In 2001-02,
  - 163 bachelors, 2 masters

Reference:
- Institutional website (retrieved October 2002): http://www.artcenter.edu

Art Institute of California (San Francisco, CA) **Private**

Degrees Offered:
- A.S. (fashion design; graphic design; multimedia and web design)
- B.F.A. (fashion design)
- B.S. (game art and design; graphic design; media arts and animation; multimedia and web design)

Students:
- Information not available

Faculty:
- Information not available

Degrees Granted:
- Information not available

Reference:

Institutional website (retrieved October 2002):
http://www.aisf.artinstitutes.edu/

California College of Arts and Crafts (San Francisco, CA) NAAB/NASAD/Private

School of Design and School of Architecture

Degrees Offered:

B.Arch. (architecture)

B.F.A. (fashion design; graphic design; industrial design; interior architecture)

M.F.A. (design)

Students:

Information not available

Faculty:

Headcount as of Fall 2002,
12 faculty (in design)

Degrees Granted:

Information not available

References:

Institutional website (retrieved October 2002):
http://www.ccac-art.edu/cgi-bin/dad?record=degrees&dbase=welcome#

California Institute of Technology (Pasadena, CA) AAU/Private

No design-related programs offered, but Cal Tech has a formal exchange program with the Art Center College of Design which gives Cal Tech students credit for ACCD courses.

References:

Institutional websites (retrieved January 2002):
1) http://www.caltech.edu/
2) http://www.admissions.caltech.edu/academics/exchange.htm

California Polytechnic State University (San Luis Obispo, CA) NAAB/NASAD/Public

College of Architecture and Environmental Design

Degrees Offered:

B.Arch. (architecture)

B.L.A. (landscape architecture)

B.S. (architectural engineering; city and regional planning; construction management; landscape architecture)

B.S.C.R.P. (city and regional planning)

M.C.R.P. (city and regional planning)

M.S. (architecture)

Students:

Headcounts as of Fall 2001,
1,678 undergraduates, 56 masters

Faculty:

Headcount as of 2001-02,
68 faculty

Degrees Granted:

In 2001-02,

192 bachelors, 14 masters
Reference:
Institutional website (retrieved October 2002):
http://www.calpoly.edu/%7Einststdy

California State Polytechnic University (Pomona, CA) NAAB/NASAD/Public

College of Environmental Design
Degrees Offered:
B.A. (art, with emphases in fine arts, graphic design, and art; graphic design)
B.Arch. (architecture)
B.S. (landscape architecture; urban and regional planning)
M.Arch. (architecture)
M.L.A. (landscape architecture)
M.U.R.P. (urban and regional planning)
Students:
Headcounts as of Fall 2001,
1,480 undergraduates, 152 masters
Faculty:
Headcount as of Fall 2001,
86 faculty
Degrees Granted:
In 2001-02,
178 bachelors, 37 masters
Reference:
Institutional website (retrieved October 2002):
http://www.csupomona.edu/~irp/

California State University (Long Beach, CA) NASAD/Public

College of the Arts
Degrees Offered:
B.F.A. (interior architectural design)
B.S. (industrial design)
M.A. (display/exhibition design; industrial design; interior architectural design)
M.F.A. (display/exhibition design; interior architectural design)
Students:
Headcount as of Fall 2001,
336 undergraduates
Faculty:
Headcount as of Fall 2002,
17 faculty
Degrees Granted:
In 2001-02,
25 bachelors
References:
Institutional websites (retrieved October 2002):
1) http://www.csulb.edu/depts/design/old/index.html
2) http://daf.csulb.edu/offices/ima/institutionalresearch/students/

enrollment_registration.html
3) http://daf.csulb.edu/offices/ima/institutionalresearch/students/retention_graduation.html

NewSchool of Architecture and Design (San Diego, CA) **NAAB/Private**

Degrees Offered:
A.A. (architecture)
B.A. (architecture)
B.Arch. (architecture)
M.Arch. (architecture)
M.S. (architeeture)
Students:
Information not available
Faculty:
Information not available
Degrees Granted:
Information not available
References:
Institutional website (retrieved October 2002):
http://www.newschoolarch.edu/about.html

San Francisco State University (San Francisco, CA) **NASAD/Public**

Department of Design and Industry (in the College of Creative Arts)
Degrees Offered:
B.A. (industrial arts; industrial arts with a concentration in product design and development)
M.A. (industrial arts)
Students:
Headcounts as of Fall 2001,
391 undergraduates, 59 masters
Faculty:
Information not available
Degrees Granted:
In 2001-02,
124 bachelors, 11 masters
References:
Institutional websites (retrieved October 2002):
1) http://dai.sfsu.edu/programs/pgrm_08.html
2) http://www.sfsu.edu/~ubp/data.html

San Jose State University (San Jose, CA) **NASAD/Public**

School of Art and Design (in the College of Humanities and the Arts)
Degrees Offered:
B.F.A. (graphic design; interior design)
B.S. (industrial design)
M.A. (industrial design)
Students:

Headcounts as of Fall 2001,
166 undergraduates, 7 masters

Faculty:

Information not available

Degrees Granted:

In 2001-02,
65 bachelors, no masters

References:

Institutional websites (retrieved October 2002):
1) http://www.sjsu.edu/depts/art_design/frames.html
2) http://www.ipar.sjsu.edu/statistical_abstract.html

Southern California Institute of Architecture (Los Angeles, CA) **NAAB/Private**

Degrees Offered:

B.Arch. (architecture)

M.Arch. (architecture)

M.R.D. (city research and design)

Students:

Headcounts as of Fall 2002,
165 undergraduates, 235 masters

Faculty:

Headcount as of Fall 2002,
80 faculty

Degrees Granted:

Information not available

References:

Institutional website (retrieved October 2002):
http://www.sciarc.edu/programs/index.html

Stanford University (Palo Alto, CA) **AAU/Private/UC8**

Joint Program in Design (a collaboration of the Design Division in the Department of Mechanical Engineering of the School of Engineering and the Department of Art in the College of Humanities and Sciences)

Degrees Offered:

B.S. (product design)

M.F.A. (design)

M.S. (product design)

Students:

Headcount as of Fall 2002,
31 masters

Faculty:

Headcount as of Fall 2002,
7 faculty

Degrees Granted:

Information not available

References:

Institutional website (retrieved October 2002):
http://design.stanford.edu/pd/intro.html

University of California (Berkeley, CA) **AAU/NAAB/Public**

College of Environmental Design

Degrees Offered:

B.A. (architecture; landscape architecture; urban studies)

M.A. (architecture; design)

M.C.P. (city planning)

M.L.A. (landscape architecture)

M.S. (architecture)

M.U.D. (urban design)

Ph.D. (architecture; city and regional planning; environmental planning)

Students:

Headcounts as of Fall 2001,
635 undergraduates, 279.5 masters and professional, 86 doctoral

Faculty:

Headcount as of Fall 2002,
38 faculty

Degrees Granted:

In 2001-02,
200 bachelors, 140 masters and professional, 25.5 doctoral

References:

Institutional websites (retrieved October 2002):
1) http://www.ced.berkeley.edu/degrees/index.htm
2) http://calprofilesplus.vcbf.berkeley.edu/majors/majorsClg.cfm

University of California (Davis, CA) **AAU/Public**

Design Program and the Department of Landscape Architecture (in the College of Agricultural and Environmental Sciences)

Degrees Offered:

B.S. (design with emphases in interior architecture, textile and costume design, and visual presentation and communication; landscape architecture)

B.S.L.A. (landscape architecture)

M.F.A. (textile arts and costume design)

Students:

Headcounts as of Fall 2000,
329 undergraduates, 7 masters

Faculty:

Headcounts as of Fall 2002,
16 tenure-track faculty, 11 lecturers

Degrees Granted:

Information not available

References:

Institutional websites (retrieved October 2002):
1) http://registrar.ucdavis.edu/UCDWebCatalog/PDF/DES.pdf
2) http://registrar.ucdavis.edu/UCDWebCatalog/PDF/LDA.pdf
3) http://www.ormp.ucdavis.edu/irweb/index.html

University of California (Los Angeles, CA) **AAU/NAAB/Public**

School of the Arts and Architecture

Degrees Offered:
B.A. (design | media arts)
M.A. (architecture; design | media arts)
M.Arch. (architecture)
M.F.A. (design | media arts)
Ph.D. (architecture)
Students:
Headcounts as of Fall 2001,
174 undergraduates, 189 graduates
Faculty:
FTE as of 1998-99,
57.1 faculty FTE
Degrees Granted:
In 2000-01,
48 bachelors, 59 masters, 2 doctoral
References:
Institutional websites (retrieved October 2002):
1) http://www.registrar.ucla.edu/catalog/catalog-40.html#
2) http://www.apb.ucla.edu/apbtoc.htm

University of Southern California (Los Angeles, CA) **AAU/NAAB/Private**

School of Architecture
Degrees Offered:
B.A. (architecture)
B.L.A. (landscape architecture)
M.Arch. (architecture)
M.B.S. (building science)
M.L.A. (landscape architecture)
Students:
Headcounts as of Fall 2000,
499 undergraduates, 32 graduates
Faculty:
Information not available
Degrees Granted:
In 2000-01,
71 bachelors, 19 masters
References:
Institutional website (retrieved October 2002):
http://www.usc.edu/dept/architecture

Carnegie Mellon University (Pittsburgh, PA) **AAU/NAAB/Private**

School of Design (in the College of Fine Arts)
Degrees Offered:
B.F.A. (communication design; industrial design)
M.Des. (interaction design; communication planning and information design)
Ph.D. (design theory; interaction design; typography and information design; new product development)

Students:
Headcounts as of Fall 2001,
180 undergraduates, 35 masters, 3 doctoral
Faculty:
Headcounts as of Fall 2001,
16 faculty full-time in the School of Design; 2 faculty with joint appointments in other schools; 10 adjunct professors and instructors
Degrees Granted:
In 1999-2000,
44 bachelors, 16 masters
References:
Institutional websites (retrieved January 2002):
1) http://www.cmu.edu/cfa/design/index.html
2) http://www.cmu.edu/ba/planning/facts1.htm

Catholic University of America (Washington, DC) **AAU/NAAB/Private**

School of Architecture and Planning
Degrees Offered:
B.S. (architecture, with concentrations in design; construction management; history of architecture; and city and regional planning)
B.S. (dual degree: architecture and civil engineering)
M.Arch. (urban design; conservation and preservation; architecture and culture; and sacred architecture)
M.Arch.Studies
Students:
Information not available
Faculty:
Headcounts as of Fall 2000,
17 full-time faculty (including the Dean and 2 Assoc. Deans), 5 adjunct and visiting faculty, 14 faculty associates
Degrees Granted:
Information not available
References:
Institutional website (retrieved January 2002):
http://architecture.cua.edu/

Columbia University (New York, NY) **AAU/NAAB/Private**

Graduate School of Architecture, Planning and Preservation
Degrees Offered:
Undergraduate joint major in architecture with Barnard College
M.Arch.
M.S. (advanced architectural design; architecture and urban design; urban planning; historic preservation; real estate development)
Ph.D. (architecture; urban planning)
Students:
Headcounts as of Fall 2000,
20 undergraduates, 491 graduates
Faculty:

Headcount as of Fall 2000,
20 tenured and tenure-track faculty

Degrees Granted:

In 1999-2000,
191 masters (academic); 78 masters (professional)

References:

Institutional websites (retrieved January 2002):
1) http://www.arch.columbia.edu/
2) http://www.columbia.edu/cu/opir/2001.htm

Cornell University (Ithaca, NY) **AAU/NAAB/Private**

College of Architecture, Art, and Planning

Degrees Offered:

B.Arch. (architecture)
B.F.A. (architecture)
B.S. (history of architecture and urbanism; urban and regional studies)
M.Arch. (architectural design and urban design)
M.A. (history of architecture and urbanism)
M.S. (computer graphics)
Ph.D. (history of architecture and urbanism)

Students:

Headcounts as of Fall 2000,
325 undergraduates, 55 graduates

Faculty:

Headcounts as of Fall 2000,
30 full-time resident faculty, 13 visiting faculty

Degrees Granted:

In 2000-2001,
123 bachelors, 69 masters, 6 doctorates

References:

Institutional website (retrieved January 2002):
http://www.architecture.cornell.edu/

Georgia Institute of Technology (Atlanta, GA) **NAAB/Public**

College of Architecture

Degrees Offered:

B.S. (architecture; building construction; industrial design)
M.I.D. (industrial design)
M.S. (architecture; building construction and integrated facilities management; city and regional planning; integrated project delivery systems)
Ph.D. (architecture)

Students:

Headcounts as of Fall 2002,
626 undergraduates, 259 masters, 58 doctoral

Faculty:

Headcount as of June 2001,
41 tenure-track faculty

Degrees Granted:

In 2001-02,
127 bachelors, 87 masters, 6 doctoral

References:

Institutional websites (retrieved October 2002):
1) http://www.irp.gatech.edu/
2) http://www.gatech.edu/colleges-schools/degree-programs.html

Harvard University (Cambridge, MA) **AAU/NAAB/Private/UC8**

Graduate School of Design

Degrees Offered:

M.Arch. I (architecture; first professional)
M.Arch. II (architecture; post-professional)
M.L.A. I (landscape architecture; first professional)
M.L.A. II (landscape architecture; post-professional)
M.A.U.D. (architecture in urban design)
M.L.A.U.D. (landscape architecture in urban design)
M.Des.S. (design studies)
M.U.P. (urban planning)
D.Des. (design)
Ph.D. (architecture; landscape architecture; urban planning)

Students:

Headcounts as of Fall 2001,
324 M.Arch., 74 M.L.A., 50 M.A.U.D./M.L.A.U.D., 46 M.Des., 31 M.U.P., 25 D.Des.

Faculty:

As of Fall 2001,
110 headcount faculty, 65 FTE faculty

Degrees Granted:

Information not available

References:

Institutional website (retrieved January 2002),
http://www.gsd.harvard.edu/

Illinois Institute of Technology (Chicago, IL) **NAAB/Private**

College of Architecture and the Institute of Design

Degrees Offered:

B.Arch. (architecture)
M.Arch. (architecture)
M.Des. (communication design; design planning; product design)
M.S. (design theory or process)
D.Arch. (architecture)
Ph.D. (design)

Students:

Headcount as of Fall 2001,
90 graduate students (in the Institute of Design)

Faculty:

Headcounts as of Fall 2001,
10 full-time faculty, 20 adjunct faculty

Degrees Granted:

Information not available

References:

Institutional websites (retrieved October 2002):
1) http://www.iit.edu/colleges/arch/
2) http://www.id.iit.edu/grad/welcome.html

Massachusetts Institute of Technology (Cambridge, MA) AAU/NAAB/Private/UC8

School of Architecture and Planning and the MIT Media Lab

Degrees Offered:

B.S. (architecture; art and design)

M.Arch. (architecture)

M.S. (architecture studies; building technology; media arts and sciences; media technology; visual studies)

Ph.D. (building technology; design and computation; design technology; history and theory of architecture; history and theory of art)

Students:

Headcounts as of Fall 2001,
73 undergraduates, 375 masters, 198 doctoral

Faculty:

Headcount as of Fall 2002,
77 tenure-track faculty

Degrees Granted:

In 2001-02,
25 bachelors, 186 masters, 30 doctoral

References:

Institutional websites (retrieved October 2002):
1) http://web.mit.edu/catalogue/degre.archi.archi.shtml
2) http://www.media.mit.edu/mas/degrees.html

University of Minnesota (Minneapolis-St. Paul, MN) AAU/NAAB/Public

College of Architecture and Landscape Architecture and the College of Human Ecology

Degrees Offered:

B.E.D. (landscape architecture)

B.S. (architecture; clothing design; graphic design; interior design; landscape architecture)

M.A. (design, housing and apparel)

M.Arch. (architecture)

M.F.A. (design, housing and apparel)

M.L.A. (landscape architecture)

M.S. (design, housing and apparel; landscape architecture)

Ph.D. (design, housing and apparel)

Students:

Headcounts as of Fall 2001,
167 undergraduates, 193 graduates

Faculty:
Headcount as of Fall 2002,
19 tenure-track faculty
Degrees Granted:
In 2001-02,
44 bachelors, 40 masters
References:
Institutional websites (retrieved October 2002):
1) http://www1.umn.edu/commpub/programs.html
2) http://www1.umn.edu/commpub/grad/majors.html
3) http://www.irr.umn.edu/plandata/#campuscollegeadmin

Appendix I: Supporting Letters

A nearly-final draft of the School of Design proposal was circulated for review to selected individuals in existing design-related academic programs around the world and in the professional design community. In addition to suggestions for textual changes to the proposal, the reviewers also sent letters and email messages supporting the establishment of a School of Design at UC Irvine. Reproduced in this appendix (in chronological order by letter date) are the letters and messages received from:

Prof. John E. and Katherine R. Littlewood **3.20.2002**
Former Director, Art Center College of Design (Switzerland) [currently of Terra Rosa/Monestevole, Italy]

Ms. Marilee Zdenek **3.29.2002**
President, Right-Brain Resources, Inc. [Santa Barbara, California]

Ms. Kristina Goodrich **4.1.2002**
Executive Director and Chief Operating Officer, Industrial Designers of America (IDSA) [Dulles, Virginia]

Prof. Lorraine Justice **5.2.2002**
Director, Industrial Design Program, College of Architecture, Georgia Institute of Technology [Atlanta, Georgia]

Prof. David M. Kelley **5.3.2002**
Design Division, Mechanical Engineering Department, Stanford University [Palo Alto, California] and Chairman, IDEO [Palo Alto, California]

Mr. Bill Dresselhaus **5.9.2002**
President, Dresselhaus Design Group, Inc. [Clackamas, Oregon]

Mr. Frank Nuovo **7.24.2002**
Vice President and Chief Designer, Nokia Design Center [Calabassas, California]

Prof. Martin Smith **7.25.2002**
Chair, Product Design Department, Art Center College of Design [Pasadena, California]

Ms. Lynn H. Shook **8.4.2002**
President, Shook & Co. Design Consultancy [St. Charles, Illinois]

Prof. Nirmal Sethia **8.6.2002**
Management and Human Resources, College of Business Administration, California State Polytechnic University, Pomona [Pomona, California]

Prof. Jim Kaufman **8.9.2002**
Department of Design, The Ohio State University [Columbus, Ohio] and Education Chair, Industrial Designers Society of America (IDSA) [Dulles, Virginia]

Mr. Charles L. Jones **8.10.2002**
Vice President, Global Consumer Design, Whirlpool Corporation [Benton Harbor, Michigan]

Mr. Ted W. Wells **8.12.2002**
Owner and Principal Architect, Living Simple Designs[Laguna Niguel, California]

Dr. Duncan Joiner **8.15.2002**
Pro Vice-Chancellor, College of Design, Fine Arts and Music, Massey University [Wellington, New Zealand]

Prof. Yrjö Sotamaa **8.15.2002**
President, University of Art and Design Helsinki UIAH [Helsinki, Finland]

Prof. Alice Lo **8.20.2002**
Chair, Departmental Teaching and Learning Committee, School of Design, The Hong Kong Polytechnic University [Hong Kong, China]

Ms. Joan S. Goldsmith **8.22.2002**
Author and management consultant [Santa Monica, California]

Dr. Leon van Schaik **8.30.2002**
Pro Vice-Chancellor, Learning and Scholarship, RMIT University [Melbourne, Australia]

Dr. Kim Myung Suk **(undated but received in early Sept. 2002)**
Chairman, Department of Industrial Design, Korea Institute of Science and Technology (KAIST) [Taejon, Korea]

Dr. Darlie O. Koshy **9.16.2002**
Executive Director, National Institute of Design [Ahmedabad, India]

Prof.ir. J.J. Jacobs **9.17.2002**
Vice Dean, Faculty of Design, Engineering and Production, Delft University of Technology [Delft, The Netherlands]

Prof. Sir Christopher Frayling **9.27.2002**
Rector, Royal College of Art [London, England]

Dr. Gülay Hasdogan **10.7.2002**
Chairperson, Department of Industrial Design, Faculty of Architecture, Middle East Technical University [Ankara, Turkey]

Prof. Pete Avondoglio **10.9.2002**
Masters Program Leader, Institute of Design, Umeå University [Umeå, Sweden]

Prof. Jonathan Schroeder **10.10.2002**
Director of Marketing, Department of Industrial Economics and Management, Royal Institute of Technology [Stockholm, Sweden]

Prof. Pierre Guillet de Monthoux **10.30.2002**
Chair, Department of General Management, Stockholm University [Stockholm, Sweden]

3.20.2002 Prof. John E. and Katherine R. Littlewood

John E. Littlewood
Katherine Roller Littlewood
Terra Rosa/Monestevole
06060 Preggio (PG), Italy
Tel/Fax: +39 075 941 2761
email: boschetti@netemedia.net

20 March 2002

Prof. Michael P. Clark
Associate Executive Vice Chancellor
University of California, Irvine
509 Administration
Irvine, California 92697-1000

Dear Michael,

We are privileged and pleased to write this letter of support for the creation of The School of Design at the University of California, Irvine.

We find the Executive Summary to be a thoughtful, timely and creative document. Its contents are completely in step with what is required for the development of a school of design in the twenty-first century.

Its mission to be a leading design school in partnership with industry, dedicated to internationalism and the holistic education of future designers is right on track.

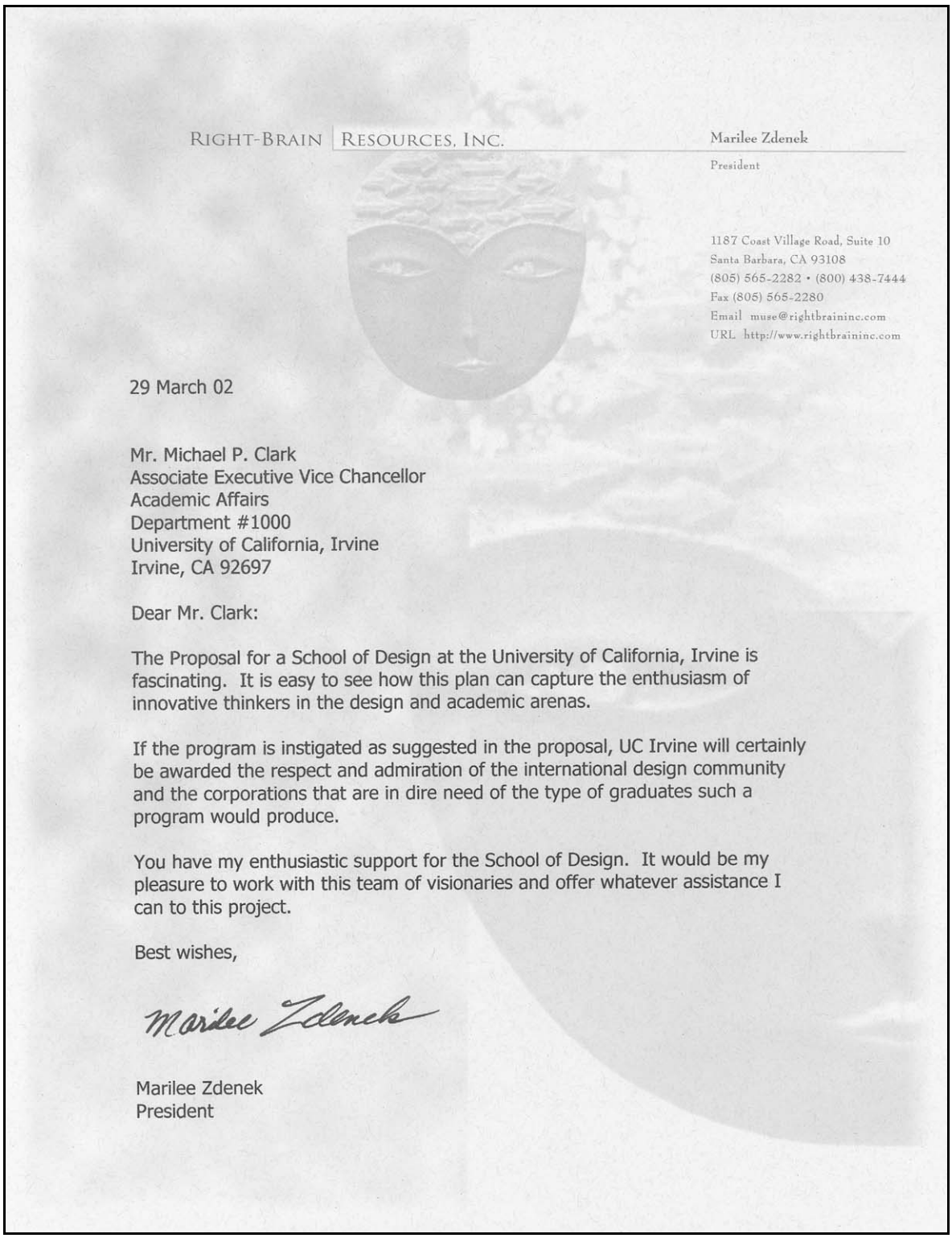
Housed within the body of the University of California, Irvine, it will enrich the offerings of the institution. The design school will uniquely provide a fusion of learning between humanism, creativity, technology and the appreciation of the societal challenges in an expanding human population in a world of diminishing resources.

As you seek to give birth to this audacious, exciting and challenging concept, we send you our wholehearted support and best wishes.

Yours truly,

cc: Charles W. Pelly
Joan C. Gregor

3.29.2002 Ms. Marilee Zdenek



RIGHT-BRAIN | RESOURCES, INC.

Marilee Zdenek
President

1187 Coast Village Road, Suite 10
Santa Barbara, CA 93108
(805) 565-2282 • (800) 438-7444
Fax (805) 565-2280
Email muse@rightbraininc.com
URL http://www.rightbraininc.com

29 March 02

Mr. Michael P. Clark
Associate Executive Vice Chancellor
Academic Affairs
Department #1000
University of California, Irvine
Irvine, CA 92697

Dear Mr. Clark:

The Proposal for a School of Design at the University of California, Irvine is fascinating. It is easy to see how this plan can capture the enthusiasm of innovative thinkers in the design and academic arenas.

If the program is instigated as suggested in the proposal, UC Irvine will certainly be awarded the respect and admiration of the international design community and the corporations that are in dire need of the type of graduates such a program would produce.

You have my enthusiastic support for the School of Design. It would be my pleasure to work with this team of visionaries and offer whatever assistance I can to this project.

Best wishes,

Marilee Zdenek

Marilee Zdenek
President

4.1.2002 Ms. Kristina Goodrich

IDSA Industrial Designers Society of America

April 1, 2002

Michael P. Clark
Associate Executive Vice Chancellor
University of California, Irvine
509 Administration
Irvine, CA 92697-1000

Dear Mr. Clark:

It was with great interest that I read your letter describing the proposed school of design for your campus. What you are planning will satisfy critical needs in the design professions and make an important contribution to their future development.

The two particular areas you plan to address that are of greatest strategic importance to the profession are:

- opportunities for graduate and doctoral study;
- significant interaction with other academic units on campus.

The profession of industrial design has a need for a program that addresses these two areas. To date, only one other school offers a doctoral program in industrial design. Those that offer Master's degrees are not located broadly enough, limiting access. The need for professionals qualified with a Master's is particularly sharp given that many educators are retiring and more academically qualified practitioners are needed.

The interaction of this School of Design with other portions of the university as well as within itself offers a rare and highly desirable opportunity to students. It will prove critical to the future success of your students and the high regard with which your program will be viewed. Although it may seem obvious, given that the workplace requires multidisciplinary teaming and respect for other professionals, the fact is that very few schools currently ensure that their programs interweave to create an educational environment the breaks down barriers to communication, learning and achievement.

It is also clear that you have selected carefully the design areas and these are appropriate. There is a crying need for Interaction Design education and I am glad that you have decided to address it. For accrediting and professional identification reasons, I would urge you to rename the Product Design area Industrial Design: specifically, to be accredited by the National Association of Societies of Art & Design (NASAD), you will need at the minimum to offer a Baccalaureate degree in Industrial Design per se; and come 2003, IDSA will only list and offer student chapters at NASAD accredited schools.

45195 Business Court, Suite 250, Dulles, VA 20166-6717, USA; 703.707.6000; Fax: 703.787.8501; E-mail: idsa@idsa.org; Web Site: www.idsa.org

4.1.2002 Ms. Kristina Goodrich (concluded)

IDSA Industrial Designers Society of America

In addition, you may consider that, whereas Interaction Design is very new, Industrial Design has a 75 year history that gives the term a foundation and relevance, regardless of its descriptive imperfections. A degree in Industrial Design brings your students and educators into a strong community.

When the question of demand is considered, it is clear that this will vary based on economic conditions; I can, however, assert that hiring is growing steadily in Industrial Design, and sharply in Interaction Design. Moreover, as offices become more sophisticated, the market for people with a Master's in Design Management should increase. There is also a very real need for doctoral level research.

As a membership association that provides conferences, seminars, journals and awards programs, IDSA does not itself hire graduates in these fields, nor does it fund programs. We do, however, offer two graduate and one undergraduate scholarship to students attending schools with student chapters.

IDSA does provide a vital network for educators and institutions serving the Industrial Design profession and its students. I would urge you to make decisions that will ensure that your School of Design is part of our community. For instance, it was industrial design practitioners and educators who set the minimal standards required for accreditation. Should you want information on NASAD accreditation, you can call 703.437.0700 and ask for Karen Moynihan.

Please accept my sincere best wishes for the success of this endeavor.

Best regards,

Kristina Goodrich
Executive Director & Chief Operating Officer

45195 Business Court, Suite 250, Dulles, VA 20166-6717, USA; 703.707.6000; Fax: 703.787.8501; E-mail: idsa@idsa.org; Web Site: www.idsa.org

5.2.2002 Prof. Lorraine Justice

Industrial Design Program
College of Architecture
Georgia Institute of Technology
Atlanta, Georgia 30332-0155
USA

(404) 894-4874
(404) 894-3396 FAX

May 2, 2002

Michael P. Clark
Associate Executive Vice Chancellor
Office of the Executive Vice Chancellor
University of California, Irvine
509 Administration
Irvine, CA 92679-1000

Dear Chancellor Clark,

This letter is in response to the request for review of the Proposal for a School of Design at the University of California, Irvine (UCI). As you know I am an accreditation evaluator for the National Association of the Schools in Art and Design (NASAD), a consultant to schools nationally and internationally, a Fellow of the Industrial Design Society of America (IDSA), and the Director of Industrial Design at the Georgia Institute of Technology (Georgia Tech). Prior to these activities, I taught and practiced in the field of Graphic Design.

In your request you asked me to respond to four major issues related to your proposal and the field of design. I will first address the issues of proposed approach, programs, projected budget and space.

The proposed approach the committee has put together for the School of Design at UCI is a sound one. The areas of study, interaction, product, spatial and design studies, are areas that continue to be in demand and show no signs of slowing. The areas are chosen well in relation to placement and employment for students matriculating through those programs. In addition, these areas offer content in both 2-D and 3-D work, hardware and software, and will work well as content areas. The budget is sound and not over stated. The only area that might be understated is the cost per course for adjunct faculty. Depending on the course taught, the figure of $4500 could run to $5500 if it is a senior designer. The recommendations for physical space are sound, and I want to emphasize the importance of interaction space and gallery space. This is a visual discipline that requires support for several visual venues.

The plan to offer a Masters and Ph.D. is also sound. Higher degrees for the fields of design are a way to build knowledge, grow respect for the field, attract research and development monies, and provide instructors for the next generation of designers. The

5.2.2002 Prof. Lorraine Justice (continued)

areas chosen for concentration for higher degrees are needed in the United States and will allow students moving through those areas to secure leadership positions in both industry and academia.

Your second inquiry concerned similarities and differences of your proposed School of Design to the current offerings of other schools, and how the differences and similarities address present and future needs. The design schools today range from art schools that teach self-expressive design philosophies to the research-based schools that teach the human-centered design philosophies. Some schools are a mix of these philosophies and seek to provide a general design education, not building artists or scientists, but designers who can work in a team but still carry a creative vision and effective problem solution. In my opinion the design field does not need more arts-based design programs because these roles are being filled by the art schools, architecture programs, and design programs that reside in art schools. We need more schools that are research-based, whose designers will be well suited to work on complex design problems, will be comfortable with a team or researchers, can draw and visually communicate in an expressive and attractive way, and can back up their design with theory and research. It is these types of designers who will help to fuel the economy of California and the United States. We compete globally to produce the best products and California is well-positioned with diversity and expertise to provide effective designers. Other schools are in flux, with many of the schools weighted down with old curricula, understaffing and an assortment of other issues that have stymied their growth and put a hold on their success. UCI School of Design has the opportunity to be the new and improved curriculum that can serve as a model for other industrial design programs, especially those in research institutions.

Your third inquiry concerned the demand for designers and the prospects for growth in the field. Although the economy has slowed in the past year, the demand for good industrial design has not. Good design is the very thing that will help a company survive through redesign of existing products or through totally new product inventions. The field of industrial design is here to stay. The New York Times, Businessweek and several other communication venues have regular reports on the state of industrial design and most corporations know they need industrial designers and interface designers to provide the aesthetic and functional finesse their products desperately need.

Your fourth inquiry concerned extramural support for faculty, students, and/or projects and what that scale might be in the future. Industry projects have fluctuated throughout the years both in quantity available and in project grant dollars. Faculty research can range from small amounts of support from industry and national grants (2-5 K) to large amounts of money (3-15 million) depending on the type of research and the industry and granting agency. If aggressive hiring is pursued for senior faculty, many of these faculty can bring grants with them to support the graduate students, and help train other faculty in proposal generation, something the design profession needs to learn.

Design centers associated with the UCI School of Design can be a source of revenue from established relationships with individual companies, and also provide a base for proposal writing to attract large grants. These centers will allow interdisciplinary and

2

5.2.2002 Prof. Lorraine Justice (concluded)

multidisciplinary work to be conducted on industry projects and national grants. Currently at Georgia Tech, we were able to bring in a 7.5 million dollar grant to disseminate information on universal design and assistive technologies. It is possible to bring in large grants, but the faculty need to be trained in grantwriting.

I am very excited about the prospect of UCI starting such a school as proposed. This school can serve as a model for other institutions in several ways, but mostly in regard to independence within the institutional structure. This independent structure will allow the school to flourish without serving the full agenda of other disciplines, something it cannot do well while it is growing and establishing a reputation. I am in full support of such a program because I believe we need more programs in the design field, especially those programs that support design research and therefore, substance of decision making, within the design field.

If I can be of assistance, or you have further questions, please contact me at the address and phone above or by email at: lorraine.justice@arch.gatech.edu

Best Regards,

Lorraine Justice, Ph.D.
Director, Industrial Design

3

5.3.2002 Prof. David M. Kelley

DESIGN DIVISION
STANFORD UNIVERSITY
MECHANICAL ENGINEERING DEPARTMENT
STANFORD, CALIFORNIA
94305-4021

May 3, 2002

Michael Clark
Associate Executive Vice Chancellor
University of California, Irvine
509 Administration
Irvine, California 92697

Dear Michael,

I am writing this letter with enthusiastic support for your proposal to start a new School of Design at UC Irvine. Although there are many initiatives going on throughout the U.S., this is the most comprehensive and inter-disciplinary approach that I have seen. It should result in your University becoming the national and quite possibly international leader in the teaching of design process and methodologies.

In reviewing the proposal and visiting with many of the faculty involved, I believe that you have a point of view that is exactly correct for teaching students to become future design leaders. I know of very few institutions that can put together an interdisciplinary faculty, an appropriate facility, and commit the necessary funding to innovate a successful program of this scale.

As you are well aware, design is a broad and complex discipline. I believe you have chosen wisely, focusing on interaction design, product design, spatial design, universal design and design management. I agree fully with your rationale not to include architecture. There are many schools of architecture, and many schools have tried to combine architecture and design with little success. Your comprehensive approach requires a large faculty and student body in order for it to become a world leader in the field. There is certainly nothing of this scale that I know of currently.

Because design education is inherently project-based in nature, it requires a commitment and budget for considerable studio and teaching space. You are particularly lucky, in my opinion, that you have the available real estate to support this necessary aspect of a successful program.

Not surprisingly, I believe that traditional design education at the university level underserves the student population. Most available programs have too narrow a focus on a single aspect of design. Today's designers in industry need to have empathy for many disciplines. Engineering, business and the disciplines representing human values are all essential areas of study for the practicing designer. California, with its innovative culture, is the perfect place for designers to be a part of a culture that supports creative thinking. I believe there is no other School that has all of the right ingredients and attitudes in order to lead in rethinking how design is taught.

5.3.2002 Prof. David M. Kelley (concluded)

There are presently several initiatives at places like UC Berkeley, the University of Minnesota, Stanford and Art Center, but none of them to my knowledge are as comprehensive or as large in scope as your proposal. It is difficult to get administration and faculty to value this broad discipline. Those of us at universities tend to reward specialization over breadth. Designers by their very nature are synthesizers over multiple disciplines.

The fact that you are developing the program at the School level gives me the most hope that your program will be successful long term. In my own experience at Stanford, I believe that this independence is the only way to ensure that a program this interdisciplinary can thrive. To start something this entrepreneurial requires this level of autonomy and commitment in a university environment.

More and more I see in industry that companies are looking at ideas that come from places between disciplines. Designers are therefore becoming more in demand because of their systems thinking and their ability to think in unique ways about problems. At Stanford and other universities that I am familiar with, more and more students are choosing design related majors. Since almost everything we come in contact with in our lives, other than nature, has been designed by someone, the opportunities for growth in the profession are extreme. This also means that we have a chance to make a difference by focusing on universal design and design sustainability.

By taking the leadership role here in design education, I believe you have a particularly interesting opportunity to involve other educational institutions and to obtain industry affiliation and sponsorship. Design faculty throughout the country feel undervalued in their own institutions and in my experience jump at the chance to affiliate with other faculty who are moving the design initiative forward. UCI could be a center for design faculty workshops and conferences. Corporations are expecting new innovation to result in the largest share of their growth. They have decided that repurposing their present products will not lead to the kind of growth that they need. Designers will obviously play a key role in enabling that growth. There are many examples of strong industrial affiliates programs at major universities, even though their design programs are not as strong in design content as your proposed program.

In reading your proposal in detail and visiting with you, I believe you clearly have outlined a path to building the leading design program in this country (and maybe in the world). The proposal for a large design faculty with an appropriate facility is exciting to all of us in the design profession, both at the university and with design firms. This will make a major impact and I am very excited to see it happen, as is everyone else to whom I tell the story. Best of luck, and let me know if there is anything that I can do to help.

David M. Kelley
Chairman, IDEO
Associate Professor, Stanford University

cc: Richard Taylor

5.9.2002 Mr. Bill Dresselhaus

DRESSELHAUS DESIGN GROUP

DRESSELHAUS DESIGN GROUP, Inc.

Industrial Design **Innovation Facilitation** **Seminars & Training** **Product Engineering** **Design Management**

Mail/Shipping: 12042 SE Sunnyside Road, PMB 604, Clackamas, Oregon 97015
Cellular: 503.539.2515 Studio: 503.760.1841 Fax: 503.760.2325
E-mail: Bill@BillDresselhaus.com Web: www.BillDresselhaus.com

Thursday, May 9, 2002

Prof. Michael P. Clark, Ph.D.
Associate Executive Vice Chancellor
Professor of English and Comparative Literature
535 Administration
University of California, Irvine
Irvine, CA 92697-1000

Dear Michael:

My congratulations for an outstanding design school proposal. I fully support the approach, philosophy and ideology of the School of Design at the University of California, Irvine (SDUCI) and the effort to realize it. The proposal is thorough, comprehensive and exceptional. I look forward to future interaction and participation in SDUCI's development and implementation. This truly an exciting enterprise!

As requested, below are some of my comments on several areas that the proposal addresses. Hopefully these will be helpful and constructive to your efforts. Regardless, my best wishes and hopes for your success.

PROPOSED SCHOOL OF DESIGN, UNIVERSITY OF CALIFORNIA, IRVINE

Centrality of Design. The idea that a school of design can and should be a central core integrating and organizing problem-resolution entity within a multi-disciplinary higher educational institution is an idea whose time has come! I believe design (and the design process) is a universal problem-solving methodology that can be applied to virtually any enterprise or endeavor. This is the real foundation for the need of a truly interdisciplinary design school that interacts, supports, serves and works with all disciplines within and without the university.

5.9.2002 Mr. Bill Dresselhaus (continued)

Discipline of Design. The SDUCI proposal often describes and promotes developing a discipline of design, as if it didn't already exist. It does, however, and in many places and institutions, though perhaps not so well taught or implemented. I think a more profound and important enterprise is in the positioning and expansion of the design discipline to broader applications and audiences. Actually, it is really a marketing and branding problem, not a development problem. Design already has tremendous application, value and usefulness in virtually every discipline from medicine to make-up and has been demonstrated to be so in most cases. The issue is awareness and perception of the general public and of other disciplines of the value and application of design. In a very real sense, every problem is a design problem to some degree (hence its universality as a problem solving method), but most people don't see it that way (hence, a bad Florida ballot system without interaction design application). We need to get to the point where all disciplines perceive and understand design value. For example, a physician-surgeon automatically knows for legal issues one engages a lawyer, for biochemical issues one engages a scientist, or for a new facility one engages an architect. The challenge for designers and SDUCI is that for new surgical procedure or new devices, that physician-surgeon (and most everyone else) knows automatically to engage a designer.

Interdisciplinary Structure. The example in the SDUCI proposal of the Florida voting system and ballot fiasco was put forth as an argument for the need for interdisciplinary design. I don't think that's the issue. Every designer and design school I know, for decades, have known that design is and needs to be interdisciplinary and most have been so to varying degrees. One can also be certain that every professional designer in the US knew, the moment it came out in the media, that the Florida voting ballot problem was the result of bad design. Interdisciplinary design and the discipline of interaction design have been around for some time. The real problem was that the people who created the voting ballots and system didn't know it! The problem in this kind of situation is not so much with design and designers, but with the rest of the world not knowing how and when to apply design to their problems and enterprises or even knowing that there is such a discipline to serve their needs. This is why SDUCI has a truly unique opportunity to literally change the world: making it aware and knowledgeable of the value of design to all human enterprise and producing graduates and research that serve that end.

Business and Design. The integration of business and design as a universal principle is one of the key realities that can be pioneered by SDUCI to everyone's benefit. Even though the 1990's saw many businesses embracing design as a core competency and strategic advantage, many business leaders still are not completely happy or comfortable with the design profession itself, which sometimes can be self-serving and narrowly focused. The rest of them don't understand design's value. It's time for a new breed of leaders that understand and meet both human and business needs in all enterprises through design. There are thousands of MBA graduates produced every year from US schools and colleges, but very few of them understand or even have a clue regarding product design and development or the value of design to business. In general, designers understand and apply business principles every day but few business people engage in

5.9.2002 Mr. Bill Dresselhaus (continued)

design, know how to apply design, or even understand or value it. Yet it is these business people, eventually in leadership and management positions at companies and organizations, who are often the buyers of design services and programs. This paradigm must change. It is time that business people become designers and designers become business people and both lead our companies, institutions and organizations. SDUCI must have an integrated relationship with business principles and philosophy and with UCI's business school. And I feel it needs to be more pervasive than only in a particular degree or special collaborative relationship. Appropriate business courses must be mandatory throughout SDUCI's curriculum.

School Independence. The SDUCI philosophy is dead on target by proposing to be a totally independent school from all other schools and departments in the university. History has proven time and again that design schools within other departments are driven and directed by that particular controlling discipline, usually to the detriment of a broader application, visibility and success of design. It is time that design is seen, valued and implemented as an integral part of every endeavor and on the same value plane and integration level as finance, engineering, business, marketing, research, science or technology. It can only do that if it is independently controlled and managed.

Design Champion. Absolutely essential to launching and maintaining SDUCI as a premier design school will be having a passionate and visionary champion at its topmost levels. Bob McKim and Jim Adams come to mind relative to the Stanford Product Design Program, revolutionary for its time and lead by these great educators and leaders. Whether it's the Dean of SDUCI or an immediate high-level associate, the school must have this level of champion to instill and inspire others with the vision, ideology and goals of SDUCI both outside and inside the school and the university. This person must be carefully selected and, most importantly, fully supported in their front-line efforts which, by their nature, will be risky and revolutionary. The statesman/champion model would especially work well here, where the statesman is the mature, well-respected, conservative who supports the school and its champion to the academic establishment. The school's champion—visionary, passionate and energetic—would be the front-line proponent of the school and its ideology.

Leaders and Leadership. The demand is really for leaders—outstanding, innovative, revolutionary, creative, design-competent, business-savvy, fearless leaders—not so much designers. There are plenty of schools that can produce competent designers. If SDUCI trains leaders with a core competency in design, business and innovation, you will have an unlimited growth market for your graduates in every field of endeavor. If you produce more designers, you will have the same market as the other design schools.

Innovation and Implementation. I believe one of the greatest obstacles to SDUCI will be overcoming the academic, bureaucratic, publish-or-perish, turf-protective institutionalism inherent in the higher educational system. Whether it's the great UC system, UCI in particular, or any other university institution, we all know it's there, and

5.9.2002 Mr. Bill Dresselhaus (continued)

the world knows it, especially your would-be outside supporters. Design, by its nature and definition, is about speed, creativity, innovation and real-world solutions. SDUCI is a design project itself: the design of a revolutionary new school of design. This project from the start must be executed with aggressive, creative implementation and innovative process to have credibility to teach others the same principles. Start by setting expectations at a revolutionary high level by launching SDUCI itself as a model of what the new design process should be in a challenging situation.

Research and Development. SDUCI's opportunity to make tremendous contributions to many fields through doctoral level research is great. I believe that one of the things that separate the truly great graduate schools from the rest of the pack is the nature of their doctoral research. The great schools attack practical, pragmatic and highly need-oriented programs and resolve them in a very usable and straightforward manner.

Product Design. The SDUCI proposal indicates there will not be a master's degree in product design. I believe this is a serious mistake. Product design is arguably the most popular field of traditional industrial design and perhaps its essential core: everything is in some sense a product (hence, the Stanford Program's focus). The major graduate degree-granting design programs have an MS in product design. Important design schools such as Stanford, Art Center, Carnegie Mellon, etc., have product design and/or product development as one of the major programs in their line-up. I believe SDUCI must be able to compete with these schools at the master's level and offer a truly unique and revolutionary program and degree in this discipline.

Financial Support. SDUCI will get extramural support if it offers a value proposition. It won't if it doesn't. Of course, it will get some loyalist support from UCI advocates, those wanting to support higher education and design education in general, and, of course, those wanting their name on a building. But the big, ongoing money will come from foundations, government and industry for solving real problems—for them. It's about business and what design can do for business, their business, whatever it may be. This means practical research projects, highly talented faculty and students, and results. The potential support level is easily on the order of millions of dollars. Stanford gets it, Art Center gets it, and SDUCI can get it too, even more and better and broader, due to its approach and ideology. Business, industry and government need solutions to real problems that meet important needs and objectives. Provide that and I feel you will have the money you need.

Curriculum Development. Unless I missed it or it is coming in future planning, I saw little or no non-design coursework in the curriculum outside of breadth elections. I think an interdisciplinary program in design needs mandatory coursework in other disciplines. The kind of designers SDUCI wishes to graduate must be well versed in many disciplines. I suggest implementing universal required overview courses in all of the major disciplines within the university such as law, medicine, engineering, science, economics, history/literature, etc. Each specific department within the university would

5.9.2002 Mr. Bill Dresselhaus (continued)

offer these courses and cover what was felt was essential overview information and exposure for designers, including laboratory classes. I believe these courses could also become positive, collaborative bridge-building vehicles within the university between SDUCI and the other university disciplines due to the mutual involvement factor. A common criticism of designers in the past has been a lack of real breadth and depth of education outside of design.

Faculty and Staff. Having non-practicing design faculty is like having non-practicing physicians teaching surgery. Understanding the value and need for full-time faculty with only a few outside adjunct professionals, it is still incumbent upon SDUCI to provide a means whereby their faculty can also be practicing professionals to an extent that they provide the best and latest information and technology to their students. This is absolutely essential to SDUCI's success and eliminates a widespread student criticism of design schools (with exceptions such as Art Center) that the faculty is not current in practice. How this is done will be a challenge to overcome. One model is the teaching hospital for physicians. Another model is faculty-based, industry-funded design projects. Another is simply providing the time, resources, support, encouragement and freedom for all faculty to do part-time design consulting. For SDUCI there must be a shift from the traditional publish-or-perish institutional attitude to a "design-or-perish" model. Otherwise SDUCI will end up as just another academically oriented design institution.

Doctorates and Teaching. Doctorates in any field are recognized when the field itself is recognized. Few people have trouble with understanding the value of Ph.D. programs in science, engineering or literature because the basic discipline is well understood. The same will be true for design. At the risk of being redundant, I emphasize the marketing and branding problem associated with design that also effects a design Ph.D. effort. It's the issue of: "Yes, I understand that an architect designs buildings, and an engineer designs machines and bridges, but now what does a designer do again?" The need for pragmatic, valuable and useful doctoral research is imperative at the outset at SDUCI.

An additional and important opportunity for SDUCI is also to produce truly teaching Ph.D.'s. Doctoral programs are, of course, research programs, and yet most of our universities have Ph.D.'s, usually poorly trained in teaching principles or good communication, teaching our young people. People trained in research and pressured to do even more research are teaching young people to learn. This is a universal complaint of the higher educational system in general. SDUCI can change that, at least for itself and its graduates. Collaboration, interaction and communication are essential elements of design. I suggest mandatory courses for all Ph.D. candidates in teaching, presentation and communication skills. I challenge SDUCI to produce doctoral gradates who are not only excellent researchers, but also excellent and outstanding teachers and change this long unresolved problem.

5.9.2002 Mr. Bill Dresselhaus (concluded)

Simulation and Design. One of the most unique and distinctive historical characteristics of the designer, whatever field, is that of simulation. Designers are by nature simulators: they draw, sketch, make models, build prototypes, visualize and make things. Simulation is an essential tactic in the process of design. The SDUCI proposal appropriately mentions simulation laboratories as part of the overall program. These are essential to success as is training and practice in simulation for all designers. Basic training in simple, broad-based simulation techniques should be mandatory with the opportunity to be specialized or more practiced with elective courses. The approach would not be one of training sophisticated visualizers (as has been the trend in the past, to the detriment of the profession, producing sketch artists who design unmanufacturable products), but one of having a repertoire of simulation tools, techniques and processes available for solving problems at any level and in any discipline. Simulation courses and training can also then be offered, as it was and is at Stanford, to other disciplines outside the design school as a universal tactic for problem resolution and not just in the domain of artists or designers. These simulation classes can also be another set of bridge-building courses within the university.

Again, my best wishes and good luck!

Sincerely,

Bill.

Bill Dresselhaus, IDSA
President
Dresselhaus Design Group, Inc.

7.24.2002 Mr. Frank Nuovo

NOKIA

24 July 2002

Michael P. Clark
Associate Executive Vice Chancellor
Professor of English and Comparative Literature
University of California, Irvine
509 Administration
Irvine, CA 92697-1000

Dear Mr. Clark:

Thank you for the follow up note regarding the proposed School of Design at UC Irvine. I am very familiar with the original letter and I regret the delay in responding. My time has been dedicated to extensive efforts in the global launch of Vertu, a new subsidiary of Nokia, creating high craft precision mobile communications products. Vertu is my concept and I serve as Board Member and Creative Director, in addition to my position as Vice President, Chief Designer for Nokia Design.

I very much support the proposed School of Design at UC Irvine. In particular, with all design education today, I would like to stress the importance of combining strategic development skills of core business and marketing concerns. These are typically separated from design studies but, in fact, are the key today to a competitive and comprehensive product offering. Hybrid teams of designers and marketing and business specialists, taking appropriate measure of emotional, practical/functional and economic issues into consideration, together with proper weighing of each influence, is key to success. Nokia gained a great deal of its success not through technology or marketing alone, and not through design alone. It was the balance of all which was right and made the difference.

Our new venture, Vertu, was proposed by me (a designer) and joined by a marketing and technology specialist in the early planning stages. It is a company with a holistic vision of combining design, brand, service and precision craft in manufacturing. I believe this will also be a success because it has the right components which are an appropriate blend of multi-disciplinary wisdom.

The Design Academy's participation in the UCI School of Design will provide a unique influence. I am pleased to endorse work represented by the efforts of The Design Academy mission.

I am currently working on behalf of Nokia to set up a plan to support projects at various universities around the world. The intent is to sponsor individual and class projects which support mobility and communication. Creation of this organized plan is only in the early stages. However, even without this formalized effort, we have had very good results in the past from our association with numerous academic research projects at the Art Center College in Pasadena, the Royal College in London and the University of Industrial Arts in Helsinki, and others in China and Japan.

NOKIA DESIGN CENTER

23621 Park Sorrento, Suite 101, Calabasas, California 91302 Telephone + 1 818 876 6000 Facsimile + 1 818 876 6089

7.24.2002 Mr. Frank Nuovo (concluded)

Michael P. Clark
24 July 2002
Page 2

In summary, I believe a School of Design at UCI is a wonderful opportunity and I support it. I feel it is likely we would find future designers from such a school and I would be pleased to participate in the creation of the new school in a variety of ways.

Yours truly,

Frank Nuovo
Vice President, Chief Designer
Nokia Design

Creative Director, Board Member
Vertu

7.25.2002 Prof. Martin Smith

Art Center College of Design 1700 Lida Street. Post Office Box 7197. Pasadena, California, Zip Code 91109-7197

ArtCenter

Michael P. Clark
Associate Executive Vice Chancellor
Professor of English and Comparative Literature
535 Admin.
University of California, Irvine
Irvine, CA 92697-1000

Phone 626.396.2200 Fax 626.405.9104

July 25, 2002

Dear Professor Clark:

I have read your proposal for a School of Design at the University of California, Irvine and have discovered it to be thorough, comprehensive and well thought through. I admit to envy - it is a rare opportunity to start with a "clean sheet". Many times I have made compromised decisions regarding our program because of the momentum of the past.

My own thinking resonates with your final concluding paragraph in the Executive Summary. The design profession is poised to emerge as a science and new academic discipline with conceptual coherence and intellectual vision. It will happen and the only question is who and where.

It is indeed a rare opportunity and I wish you and your colleagues the best of luck.

Sincerely yours,

Martin Smith

Chair Product Design Department,
Art Center College of Design

8.4.2002 Ms. Lynn H. Shook

SHOOK & CO DESIGN CONSULTANCY

August 4, 2002

Michael P. Clark
Associate Executive Vice Chancellor
Professor of English and Comparative Literature
535 Administration
University of California, Irvine
Irvine, CA 92697-1000

Dear Michael:

Thank you for the opportunity and privilege to play a small part in the unfolding vision of the School of Design. This vision and framework proposed is so aptly appropriate for providing an expanded understanding in to the theory and practice of design. It is a rare experience to participate in the emergence of a new paradigm in which the present and future of design, the designer, corporations, institutions and society will be positively impacted on a global scale.

I applaud the committee for taking a holistic approach fusing the theory and scholarly pursuits of design with realistic application to business and industry while addressing the broader cultural and philosophical issues facing our future innovators and designers.

The research-based, interdisciplinary approach to design is the fundamental infrastructure that has needed to be formalized and necessary for navigating a more complex and demanding environment in which design must strive for excellence and succeed in the final analysis.

The time is right for design to be legitimatised as a core value and strategic tool in business. More importantly the designer graduating from the School of Design will be equipped to participate and contribute more effectively in the planning process and have a greater chance of becoming an invaluable member of the executive management team and/or consultants serving major corporations. They will have a strong voice in evolving the future of companies and the future of design.

The proposal is ambitious, but achievable and greatly needed. The plan has reached beyond the norm or the expected by reengineering the fundamental processes and methodologies and physical environment in which design innovation will thrive. The School of Design is approaching the issues of design that are both emerging and anticipated in an appropriate and dynamic way to have the greatest chance of success for the students, the faculty, the sponsors, the community, and society, while positioning the University in the role of intellectual and institutional leadership.

I have been a professional designer since 1968 and have held many diverse roles in several industries giving me various perspectives in which to view design in action. I believe that design management, business and industry need the support of education and research to prepare and help define a new kind of designer preparing them for a more expanded role. I also believe that business and industry will need the support and understanding to create more effective physical and organizational structures to support an interdisciplinary environment. The School of Design can be the catalyst for meeting this challenge. I enthusiastically support the proposal and encourage the University and the board to give it life and the chance to become a reality.

Again, Michael, thank you for this opportunity to have a voice and share my enthusiasm for the School of Design you and the committee are proposing.

Sincere regards,

Lynn H. Shook

JONSHOOK@FOXVALLEY.NET | PH 630.587.9290 | 1719 RIVERSIDE AVENUE
LYNNSHOOK@FOXVALLEY.NET | FX 630.587.9291 | ST. CHARLES, ILLINOIS 60174

8.6.2002 Prof. Nirmal Sethia

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

Management and Human Resources
College of Business Administration

August 6, 2002

Dr. Michael P. Clark
Associate Executive Vice Chancellor
University of California, Irvine
Irvine, CA 92697

Dear Prof. Clark:

Thank you for the opportunity to review the UCI proposal for a School of Design. I congratulate you and your colleagues for the outstanding quality of this proposal. Not only it is thorough and well-grounded, but is also very insightful and well-reasoned.

I strongly endorse the basic idea of a School of Design on your campus, and I also find that this proposal is right on target about what kind of institution this new school ought to be.

As you are aware, I have been interested in the field of design for nearly a decade. First with a grant from the National Endowment for the Arts, and then with a grant from the National Science Foundation, I have been examining the role of design in entrepreneurship, business competitiveness and technological innovation. In course of my work I have visited a large number of design firms, corporate design departments, professional organizations in the field of design, and design schools in the U. S., Europe and Asia. I have also formed strong professional ties with the leading thinkers and practitioners in the field. With this background, a single most critical concern I have felt is about the state of affairs in design education. There appears to be a very disturbing divide between the cutting edge of design profession and the status of design education. While in professional practice designers increasingly deal with multidimensional problems whose solution requires an artful balance between technological state-of-the-art, business imperatives and social expectations, curricula in most design schools remain geared to a simplistic vocational tradition. Thus, there is a pressing need for a new paradigm in design education to train designer adequately equipped for the challenges and opportunities of today and tomorrow.

I feel convinced that the UCI's School of Design will become a pioneering institution to articulate and implement the new paradigm in design education. It is also fitting and timely that this initiative is coming from a major research university in California. In the past 15-20 years our state has clearly emerged as the world's pace-setter in design (both product design and automotive/transportation design), and yet with the sole exception of Stanford, currently there is no design program offered at any of the research universities in California. And even the Stanford program, housed in Mechanical Engineering, is somewhat narrow in its scope and its focus.

In my assessment the proposed School of Design at UCI clearly will have the potential to become a global center of excellence in the field. The proposal is particularly commendable for the inclusion of graduate level offerings, and for its emphasis on interdisciplinary work and research-oriented scholarship. From an educational perspective, the various programs described in the proposal will not only advance the frontiers of design education, but will also serve as vehicles for enrichment and innovation in many different areas of professional education including business, engineering, medicine

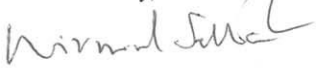
Pomona, CA 91768 Telephone (909) 869-2414 Fax (909) 869-4353

8.6.2002 Prof. Nirmal Sethia (concluded)

and social ecology. The School may also become the premier producer and nurturer of the design faculty of the future. Overall, the UCI School of Design will fulfill a variety of urgent and vital needs of our industry and our society.

Some thirty-plus years ago, the Nobel Laureate Herbert Simon envisaged a future "in which our main interest in both science and design will lie in what they teach us about the world and not in what they allow us to do to the world. *Design like science is a tool for understanding as well as for acting.*" [Italics mine.] Your School may finally help realize this vision where design will become concerned as much with thought and reflection as it is with action and change. Therefore, I hope that the University will move expeditiously with the process of establishing this School.

Yours sincerely,



Nirmal Sethia, Ph. D.
Professor, Management and Human Resources
Cal Poly Pomona
(909) 869-4152

8.9.2002 Prof. Jim Kaufman

Jim Kaufman, 03:00 PM 8/9/2002 -0400, RE: Design School Proposal

X-From_: kaufman.9@osu.edu Fri Aug 9 12:01:14 2002
From: "Jim Kaufman" <kaufman.9@osu.edu>
To: "Michael Clark" <mpclark@uci.edu>
Subject: RE: Design School Proposal
Date: Fri, 9 Aug 2002 15:00:35 -0400
X-Mailer: Microsoft Outlook IMO, Build 9.0.2416 (9.0.2911.0)
Importance: Normal

Michael:

Comments about UC Irvine proposed design program:

I want to first of all congratulate you on a superb vision of a design school set in a context of looking at the future. If this proposal is fully realized it will change the entire direction of design education and scholarly research. I apologize for my delay in making comments, but my life and work have been totally engaged over the last six months. I hope that I am not too late and look forward to helping more, if needed.

Here is my personal and professional context to your plan: I have been a practicing designer for 36 years, been involved with higher education as a faculty for 29 years, a school and department administrator for 13 of those years, a member of IDSA for 29 years, have three design degrees, serve as IDSA's national elected education chair, and I am a NASAD evaluator and accreditation commissioner.

I will be straightforward with my comments and unfortunately because of timing (I leave for vacation in a few hours) brief on explanation.

Your concept of developing design into a science is noteworthy and ambitious but I believe naive in vision and position. I believe there is a bunch of science to be discovered in the world of design. I caution that it may be misinterpreted by some as like the natural sciences- most likely like engineering folks. My suggestions are in you language to maintain a balance between the science and art of design. That is where the power of this profession lies. We are facilitators between two divergent disciplines but compliment each other. There are few other professions that can say they accomplish this- being a mixture of visual skills, knowledge and experience blended to serve mankind. In your language you do not have to use the word "art" but should always use "visual language and/or thinking" in compliment to the scientific mythological direction of your program description.

Proposed undergraduate degrees:
Design studies (B.A.) In context to your large program proposal this degree track needs to be there but you should not anticipate it would be very popular with small numbers. You will have to clearly articulate the next

Printed for Michael Clark <mpclark@uci.edu>

8.9.2002 Prof. Jim Kaufman (concluded)

Jim Kaufman, 03:00 PM 8/9/2002 -0400, RE: Design School Proposal

steps beyond this course of study.

Please consider a "minor in design practice" for "non-designer" targeted for business and engineering majors.

I would recommend that "spatial design (B.A.)" be a B.S. degree or professional degree program. The way your proposal describes it, there should be high demand for this specialty from many industry sources. I do not like the term "spatial" and would search for a better title, such as "environmental product design."

Proposed graduate degrees:
These are all appropriate but I question the rationale for NOT offering a M.F.A., the current terminal degree for design. It is usually stated when universities search for faculty positions they specify the terminal degree and specify the M.F.A. or equivalent masters degree, which may be a 60 semester hour M.S. degree. If your intention is to offer a 60 hour M.S. that is equivalent to an M.F.A., then I think you are on solid footing. If your vision is that the M.S. degree will not be a terminal degree in design to qualify one to obtain a faculty position, but one only to advance ones career base to a higher professional levels, like an M.B.A. and the new standard for a terminal degree to be a faculty will be a Ph.D., I suggest caution. This could prove negatively on the state of design education today. Much of your program has been formulated by this push for the Ph.D., but you must be aware that the current design community cannot support even the M.F.A. requirement, attracting few talented individuals to faculty ranks.

I believe what everyone wants is a design profession meaningfully progressing forward seeking new knowledge, but also continually developing a quality stream of well prepared practitioners to serve industry. Your proposal can accomplish both, but should not be divided. When too many, uninformed administrators begin to require the Ph.D. as the degree to be on a faculty, it will crush the already fragile personal situation we are now face. I encourage you to not, at this time, promote the Ph.D. in Design as the terminal degree to become a faculty. I do encourage you to enlist a broader audience to discuss these issues, before any damage is done.

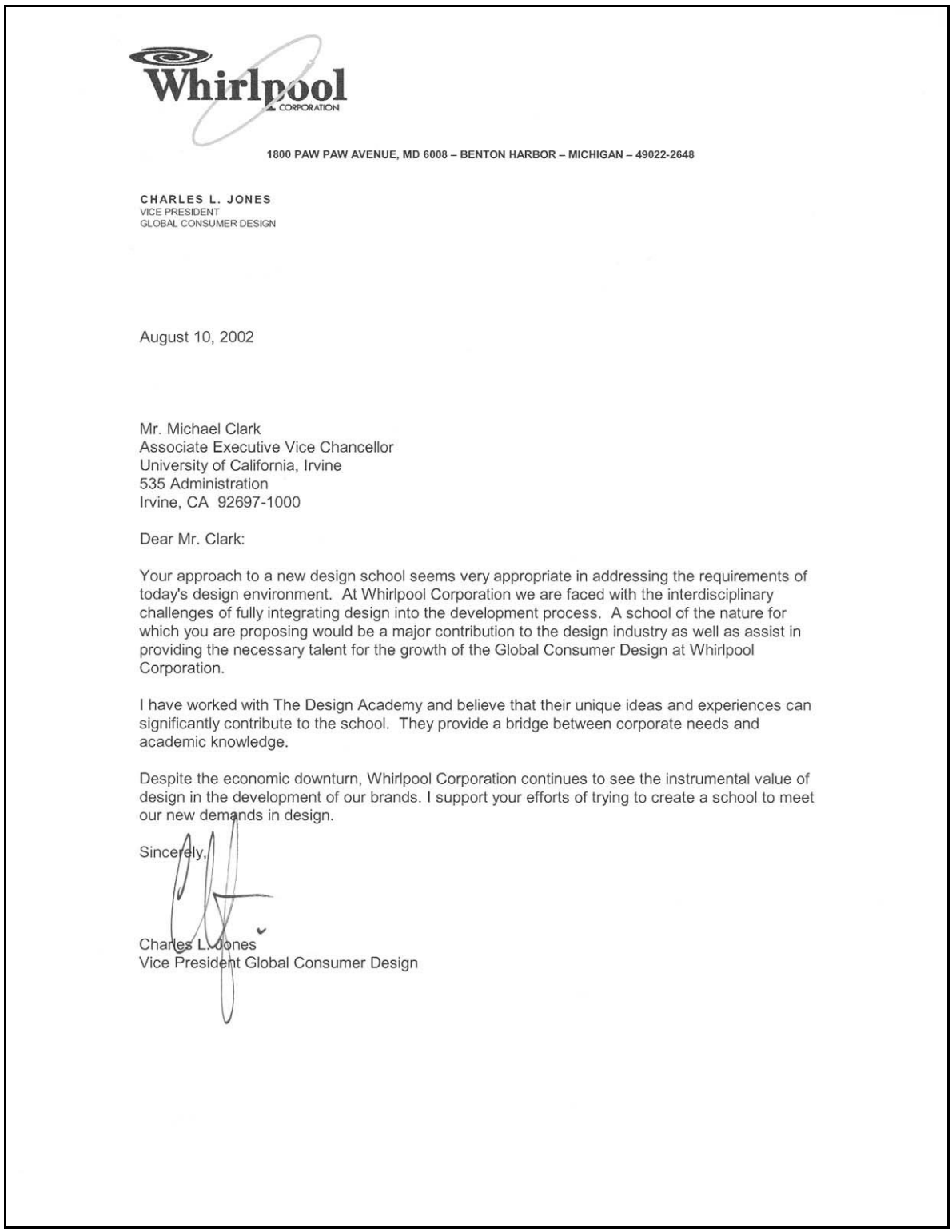
I encourage you to consider a M.F.A. and be accredited by NASAD.

I hope those brief comments helped. If you need anything at all to help to move you plan forward, please contact me.

Sincerely,
JIM KAUFMAN IDSA
Education Chair
Professor of Design

Printed for Michael Clark <mpclark@uci.edu>

8.10.2002 Mr. Charles L. Jones



Whirlpool CORPORATION

1800 PAW PAW AVENUE, MD 6008 – BENTON HARBOR – MICHIGAN – 49022-2648

CHARLES L. JONES
VICE PRESIDENT
GLOBAL CONSUMER DESIGN

August 10, 2002

Mr. Michael Clark
Associate Executive Vice Chancellor
University of California, Irvine
535 Administration
Irvine, CA 92697-1000

Dear Mr. Clark:

Your approach to a new design school seems very appropriate in addressing the requirements of today's design environment. At Whirlpool Corporation we are faced with the interdisciplinary challenges of fully integrating design into the development process. A school of the nature for which you are proposing would be a major contribution to the design industry as well as assist in providing the necessary talent for the growth of the Global Consumer Design at Whirlpool Corporation.

I have worked with The Design Academy and believe that their unique ideas and experiences can significantly contribute to the school. They provide a bridge between corporate needs and academic knowledge.

Despite the economic downturn, Whirlpool Corporation continues to see the instrumental value of design in the development of our brands. I support your efforts of trying to create a school to meet our new demands in design.

Sincerely,

Charles L. Jones
Vice President Global Consumer Design

8.12.2002 Mr. Ted W. Wells

TedWWells
living simple

30942 Westgreen Drive
Laguna Niguel
California 92677

tel 949 495 6009
fax 949 495 6149

name@tedwwells.com
www.tedwwells.com

12 August 2002

Michael P. Clark
University of California, Irvine
Office of the Executive Vice Chancellor
509 Administration
Irvine, California

Dear Michael:

I've read, and re-read, the proposal for a School of Design. As I said when we spoke, I am very happy such a thing is in the works.

Following my general comments, I've answered some of the specific questions you ask in your solicitation for advice. Some of my comments are slanted toward architecture, of course, but the concepts apply to all the design disciplines.

There are so many good things in the proposal. I think some of the best are:

1. **Successful designers are generalists with specific skills.**

The four areas of specialization are intriguing and the key is that students are required to study each discipline. This reflects how life is, or should be, for designers. It will be important to require understanding and training in the four primary areas of specialization, rather than simply a cursory overview.

Good design is about meeting the needs of people, with the utmost clarity and efficiency. This requires skills in many disciplines beyond simple aesthetics.

It appears your program hopes to recapture such some of the idealized concepts of a design professional in the spirit of the Renaissance, or as later epitomized by Thomas Jefferson—that of a worldly master creator or builder, well-traveled, well-schooled in all areas, and expressing oneself through the noblest of arts—architecture and design. This humanist approach to design is well-documented throughout history. It is only in the past fifty years or so that it has been lost in design education.

8.12.2002 Mr. Ted W. Wells (continued)

2. **The importance of "designers as managers," not "managers of designers."**

The key to success in the future is found in a traditional concept of architects as managers of entire teams of builders and artisans, and as team leaders working with clients to create an overall concept and aesthetic direction that meets broader goals.

One of the ongoing discussions among architects is the idea of regaining control of a project. The profession and schools have let this control slip away by focusing on specialization to such a degree that modern corporate architects are project managers, but lack the acumen of business professionals. They coordinate different architects for design, documentation, and landscape; engineers for structural, civil, mechanical, electrical, lighting, energy, traffic and acoustics; interior and graphic designers. The architect has become a bureaucratic manager without authority. This definition of a modern architect is not the career most students aspire to.

Many designers want to run their own successful firm, an independent atelier with exciting and important projects, offering creative freedom and public recognition. It is a romantic vision, but one that is possible. Even large, progressive corporations understand this desire and often set up quasi-independent studios under their corporate umbrella.

To operate, or work within, a successful design studio, architects must be managers, but they must manage on their own terms as designers if they expect to obtain the power and respect that will allow them to influence the built environment. By allowing others to define their role as a manager, with little or no training in business management, architects have lost control.

3. **A new paradigm needs to be established for designers to succeed in a new world.**

The proposal states this quite well. Some schools of design state such objectives but they are rarely achieved. The problem is that they have created a paradigm within the academic world, but it is unrelated to the profession.

Designers in all fields have an opportunity to become the business leaders of tomorrow. In a world where the distinction among products becomes more tightly focused, the differences will be defined less by function and more by design. A designer will be need to understand business, markets, distribution, manufacturing and selling.

8.12.2002 Mr. Ted W. Wells (continued)

4. **Design as a field worthy of serious study and research.**

   Designers often harbor the insecurities that seem to breed creativity. At the same time, they bemoan the lack of respect shown the profession. Since respect is earned, gaining respect will start when designers take their own profession seriously---and have the data to support what can seem like capricious choices to an outsider.

   Design should be a reflection of human behavior and I hope that the new school incorporates this aspect into teaching, research and service. The need is not to understand human behavior, but a need to understand how design addresses human behavior. With an emphasis on strong research, you have proposed a way of doing this.

5. **A flexible and varied creative process is a more practical and logical way to design.**

   Designers have an image problem of being artists. In the business world, "artist" means impractical, illogical and unproductive, none of which are good for the bottom-line. The adaptability of a company to maneuver quickly and creatively will determine success in the future. The proposal's broad-based emphasis on process over style, and discipline over disarray, will be the key to success in the design world of tomorrow—and will create leaders in the design field who can guide these changes.

Here are some points I would like to see included in some way:

1. **Design for people.**

   As advanced technology becomes an inseparable part of new products and the improvement of existing products, the key to widespread success for the designer will be to make more user-friendly machines and spaces. This will involve not only bio-technical aspects of use, but also the psychological and emotional aspects of the user. A designer must be a keen observer and interpreter of human behavior in an intuitive way. Success involves the inclusion and needs of the human condition in design.

8.12.2002 Mr. Ted W. Wells (continued)

2. Design for function and feeling, not just for appearance.

This is key for the future of design. It's not just function over form; it's a melding of the two in the seamless way of Nature. As the most efficient designer, Nature has created the most universally beautiful objects, such as flowers, mountains, and sunsets. There is no better argument that supreme function is eminently beautiful.

The reason much 20th century reductive design is undesirable to a great many people is that the designer is not addressing the multitude of human needs---physical and psychological---in the creation of a new product or space. Scandinavian design of the 1950s and 60s understood the desirability of organic and humane solutions in reductive design. Never before or since, has modernist design been so widely admired, accessible and successful.

3. Learning from the past.

Design history is only given a cursory review in schools today. This is a curriculum change that was espoused in the latter half of the 20th century. Arguably, this era of design history has produced some of the most publicly reviled and artistically despised functional art and architecture. The pervasive belief that Modernism is a righteous dictum, and no other stylistic concepts can be explored in schools of design, is neither healthy nor productive.

Foundational courses are lacking in existing design schools. In the new school, it must be acknowledged that history can add to a deeper understanding of design's role in society.

4. Diversity is a valid component of the design process.

The school should work toward recruiting a diverse faculty and student body and use that diversity as a rich source of instruction.

Life experience, particularly the simple, naïve and honest perceptions of a student, should be encouraged and nurtured. Design school is not boot camp. The school's intent should not be to break the student down to invalidate previous life experience and mold the individual in the manner of a professor, dean or academic philosophy.

8.12.2002 Mr. Ted W. Wells (continued)

In a practical, architectural example, no one understands the problems of, and the solutions for, the inner city, better than someone who has lived there.

The new school can take advantage of this diversity to understand society better and work to solve problems through design.

Here are my thoughts about the specific items in your solicitation:

Items 1 and 2 are answered above.

Item 3: "Comment on the demand for designers trained as proposed in the new school of design, and prospects for growth in the field".

The design profession is being diluted because designers are not trained in a way that makes them a valuable member of a business team. In many companies, strategies are designed, markets identified, and solutions resolved before the designer is brought in to make it all look pretty.

Designing is problem-solving. These methods can be applied to any challenge that faces a company today. An interesting and thorough look at that fact is provided in the series of three books by Edward R. Tufte, a professor of political science and statistics *and* graphic design at Yale University. Tufte demonstrates how the well-designed graphic presentation of data can enhance the decision-making process of organizations and the public. In one well-known example, he shows how the proper graphical representation of data could have prevented the launching of the space shuttle Challenger. Using the same data that was presented to NASA and Morton Thiokol by the various engineers, he clearly shows that the flight was doomed twelve hours before it took off. Tragically, the data was presented in a graphical way that unknowingly hid the truth from decision makers.

In an information-overloaded and visually over-stimulated society, design will take an increasingly important role.

8.12.2002 Mr. Ted W. Wells (concluded)

UCI design school
6

Item 4: "Will my own firm be interested in hiring graduates of such a school and why"

Absolutely. It is difficult to find designers who have clear, problem solving abilities across a range of fields. My own work requires expertise in architecture, construction, landscape, graphics, furniture, lighting and object design. From an academic training standpoint, I have yet to find anyone who is enough of a generalist but has the specific skills in even a few of these areas to serve our clients well.

Bottom-line: I need creative problem solvers with artistic abilities. I am not alone.

Item 5: "The possibility of our firm supporting such a school in the following ways. . ."

At this early stage in thinking about the new design school, I am most interested in two areas: a) financial support for students, and, b) participation in formal partnership or association with the school. As an individual, I welcome the opportunity to be directly involved with the school in some way.

Mike, thank you very much for letting me offer my opinions on these things. As I said, the proposal is very exciting to me. The new school is so desperately needed, not only in southern California, but also in the realm of design education.

I appreciate your efforts and the hard work to get this going.

Yours,

Ted Wells

8.15.2002 Dr. Duncan Joiner

Massey University
COLLEGE OF DESIGN, FINE ARTS AND MUSIC

Wellington Campus
Private Box 756,
Wellington,
New Zealand
Telephone: 64 4 801 2794 ext 6695
Facsimile: 64 4 801 2799

15 August 2002

Michael P Clark
Associate Executive Vice Chancellor for Academic Planning
University of California, Irvine
509 Administration
Irvine, CA 92697-1000
U.S.A

Dear Mr Clark

Many thanks for your letter dated 19 July 2002 with attached executive summary of the *Proposals for a School of Design at the University of California, Irvine.*

In your letter, you explain that in proposing the new School of Design, you are also seeking partners for an international consortium of design schools, which you are tentatively calling *The Academic Alliance*. You have invited me to indicate whether Massey University is interested in participating in the Alliance, and also to indicate the degree of our interest.

I am pleased to confirm that we are very interested in participating in the *Academic Alliance*. You may be interested to know that I have had an opportunity to discuss the *Academic Alliance* and the Design Academy with Charles Pelly and Joan Gregor who are currently in New Zealand. I think the concept of international cooperation in advancement of design teaching, research and scholarship is timely and exciting.

The objectives set out in your proposal for the School of Design, embracing design as a formal academic discipline, and including development of a body of knowledge through advancement of intellectual and scientific understanding of the theory and practice of design, are ones we identify with most positively and strongly.

With some 115 years of experience of design education in the Massey University School of Design, we moved from tradtional practice-based teaching programmes into University degree level design education ten years ago with the 4 year Bachelor of Design, followed soon after by accreditation of our Masters and PhD programmes in Design.

Research, methodological reflection, publication, and creative practice are core underpinnings of our School of Design, which it shares with the School of Fine Arts and the Conservatorium of Music, working as a College of integrated schools. The Schools also interact in the wider context of the University's strong scientific, humanities and business bases.

Te Kunenga ki Pūrehuroa
Inception to Infinity: Massey University's commitment to learning as a life-long journey

75 YEARS of innovation seventy five

8.15.2002 Dr. Duncan Joiner (concluded)

I am very pleased that an institution with the standing of the University of California, Irvine, is now considering this proposal to include design as one of its academic disciplines, and I will be very pleased to offer whatever support I can for the proposal.

I look forward to working with your University in development of, and participation in the *Academic Alliance* for design. In the meantime, I send you very best wishes for the development of your School of Design.

Yours sincerely

Dr Duncan Joiner
Pro Vice-Chancellor
College of Design, Fine Arts and Music

8.15.2002 Prof. Yrjö Sotamaa

Yrjo Sotamaa, 12:28 PM 8/15/2002 +0200, The Design Academy

X-From_: sotamaa@uiah.fi Thu Aug 15 03:21:20 2002
X-Sender: sotamaa@mail.uiah.fi
Date: Thu, 15 Aug 2002 12:28:14 +0200
To: mpclark@uci.edu
From: Yrjo Sotamaa <sotamaa@uiah.fi>
Subject: The Design Academy
Cc: eija.nieminen@uiah.fi, rnikkan@uiah.fi

Dear Mr. Clark,

thank you very much for your letter of July 19. Do to the holiday season the answer was delayed.

Your proposal is addressing the right issues in design education. Interdisciplinarity and the theoretical foundations of the design processes and methodologies are according to our recent studies key issues in future design education. The importance of research cannot be underestimated neither the need to build a closer cooperation with industry.

The University of Art and Design Helsinki would be interested in participating to your "Academic Alliance". We would be willing to share our experience with you in developing this new programme. In return, I am confident, we could learn a lot from this new initiative.

Best regards,

Yrjö Sotamaa

--
Yrjö Sotamaa
President, Professor
UNIVERSITY OF ART AND DESIGN HELSINKI UIAH
phone +358 9 75630200
mobile +358 500 503868
fax +358 9 75630372
www.uiah.fi
Assistant to the President Ms. Pirkko Salmela
phone +358 9 75630370
fax. +358 9 75630372

Printed for Michael Clark <mpclark@uci.edu>

8.20.2002 Prof. Alice Lo

THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

香港 九龍 紅磡
Hung Hom Kowloon Hong Kong
校長
潘宗光 教授
President
Prof. Poon Chung-kwong
PhD, DSc, JP
設計學院 太古講座教授兼學院主任
傅哲強 教授
Swire Chair & Head of School of Design
Prof. John Hamilton Frazer
AA Dipl., MA (Cambridge), FCSD, FRSA, IIKDA
Tel (852) 2766 5445 Fax (852) 2774 5067
E-Mail: sdfrazer@polyu.edu.hk

Mr. Michael P. Clark
Associate Executive Vice Chancellor
For Academic Planning
University of California, Irvine
CA 92697
U.S.A.

20 August 2002

Dear Mr. Clark

Thank you for your letter and proposal dated 19 July 2002. I am very pleased that the University of California, Irvine is developing a proposal to establish a School of Design based on an interdisciplinary approach to design. This is very much in line with our School's philosophy.

We set up an multidisciplinary and interdisciplinary BA(Hons) in Design programme five years ago. We have developed a new breed of visionary designers in the context of social and cultural awareness, internationalisation, and in technologically advanced studios. We are looking for partner institutions for exchange programs for faculty and students. Therefore, our School is very interested in joining your proposed "Academic Alliance" and "The Design Academy".

We look forward to future collaborations with your institution and all the best with your proposal for a School of Design.

Yours truly

Alice Lo

Alice Lo
Chair of Departmental Teaching and Learning Committee
School of Design
The Hong Kong Polytechnic University

8.22.2002 Ms. Joan S. Goldsmith

JOAN S. GOLDSMITH
2411 EIGHTEENTH STREET
SANTA MONICA, CALIFORNIA 90405
310-399-4776
FAX 310-399-5906
E-MAIL: JGOLDSM@AOL.COM

August 22, 2002

Michael P. Clark
Associate Executive Vice Chancellor
Professor of English and Comparative Literature
University of California, Irvine
509 Administration
Irvine, CA 92697-1000

Dear Dr. Clark,

It is with great pleasure that I strongly endorse the proposal for a School of Design at the University of California, Irvine submitted by Charles W. Pelly and Joan C. Gregor.

As I draw upon my years of experience in designing graduate programs for students who are professionals at Harvard University, Cambridge College, California State University Northridge, UCLA and Antioch University, I can appreciate the elegance of the proposal program and its' relevance to students seeking an interdisciplinary approach.

I am especially impressed with the proposal interplay between the design curriculum and other academic units. As an organizational consultant to Fortune 100 Companies and public and private institutions and governmental agencies, I would be happy to recommend graduates of this proposed program for positions as well as internships and apprentice placements.

I know that Charles Pelly and Joan Gregor have an outstanding history of excellence in the field. I feel certain that they will deliver the visionary and practical leadership necessary to make this proposal successful.

Thank you for including me in the review process. I look forward to learning more about the program as it proceeds to the implementation phase.

Sincerely,

Joan Goldsmith

Cc: Charles Pelly
Joan Gregor

8.30.2002 Dr. Leon van Schaik

Please quote our reference on all correspondence:
Ref.:OUT/2002/00426

30 August, 2002

RMIT UNIVERSITY

CHANCELLERY

City Campus
GPO Box 2476V
Melbourne 3001
Victoria Australia

Level 7
171 LaTrobe Street
Melbourne 3000
Victoria Australia

Tel +61 3 9925 2002
Fax +61 3 9925 3185

Michael P. Clark
Associate Executive Vice Chancellor for
Academic Planning
University of California, Irvine
509 Administration
Irvine, CA 92697-1000
USA

Dear Mr Clark,

RMIT University would be interested in participating in the international consortium of design schools you are considering.

We await further developments with interest.

Yours faithfully,

Leon van Schaik
Pro Vice-Chancellor (Learning & Scholarship)

(undated but received in early September 2002) Dr. Kim Myung Suk

KAIST 한국과학기술원
Korea Advanced Institute of Science and Technology
대전광역시 유성구 구성동 373-1 우편번호 305-701 전화:(042)869-2114, 5114 팩스:(042)869-2210, 2220
373-1, Kusong-dong, Yusong-gu, Taejon 305-701, Korea (Tel)+82-42-869-2114, 5114 (FAX)+82-42-869-2210, 2220

Miclael P. Clark
Associate Executive Vice Chancellor
for Academic Planning
535 Administration
Irvine, CA 92697-1000

Dear Mr. Clark,

Thank you for your letter dated on July 19th.

First of all, I want to congratulate on your planning for the development of School of Design at UCI. I also appreciate your generous proposal to KAIST as a partner for 'the Academic Alliance."

The faculty members at the Dept. of Industrial Design at KAIST discussed about your proposal, and considered the followings.

1. We have a very affirmative opinion about the foundation of "The School of Design" at UCI.
2. The proposal of "The Academic Alliance" is very impressive to us, especially in the Global Age,.
3. Four specialized areas (interaction design, product design, spatial design, and design studies) are very similar to the research areas at KAIST.
4. Therefore, we want to keep the academic relationship between KAIST and UCI positively and continuously.

We wish your project could be successfully developed. If you have any further discussion, please contact with us without hesitation.

Sincerely yours,

Kim Myung Suk Ph.D.
Chairman,
Department of Industrial Design
Korea Institute of Science and Technology(KAIST)
e-mail: mskim@kaist.ac.kr
phone: +82-42-869-4511
fax: +82-42-869-4510

9.16.2002 Dr. Darlie O. Koshy

राष्ट्रीय डिज़ाइन संस्थान
NATIONAL INSTITUTE OF DESIGN
पालडी अहमदाबाद 380 007 भारत
दूरभाष (079) 660 5241 / 663 9692 फैक्स (079) 660 5242
ई-मेल : koshy@nid.edu

DR DARLIE O KOSHY MBA, Ph.D. (IIT)
EXECUTIVE DIRECTOR

Paldi Ahmedabad 380 007 India
Telephone (079) 660 5241/663 9692 Fax 079 660 5242
e-mail : koshy@nid.edu

2772

Mr Michael P Clark
Associate Executive Vice Chancellor
for Academic Planning
509 Administration
Irvine, CA 92697-1000

16th September 2002

Dear Mr Clark,

Proposal – "Academic Alliance"

At the outset I sincerely regret for the delayed response to your letter of 19th July 2002. While my overall intention to the response is to support most positively, "the Academic Alliance" of your vision; I am in the midst of internalising the proposal so that my expression of interest can be geared towards facilitating an active mutually beneficial relationship. May I take this opportunity to offer our full-fledged support in this collaborative venture.

May I also seek your consent in extending the time limit for my reaction? I have put your proposal forth to senior members of the faculty at NID and would revert to you with our views by **30th October 2002**. For all practical purposes, NID would be willing to partner with the University of California for the various design research and PG educational programmes. Could you please forward us a more concrete plan of action focusing on the extent of support and involvement required on these two areas.

We look forward to an early reply.

With best wishes,

Yours sincerely,

Dr Darlie O Koshy

9.17.2002 Prof.ir. J.J. Jacobs

TU Delft

Delft University of Technology

Faculty of Design, Engineering and Production

Landbergstraat 15
2628 CE Delft
Tel.+3115 2784750
Fax.+3115 2787316

To: Michael P. Clark
Associate Executive Vice Chancellor
for Academic Planning
University of California
509 Administration
Irvine, CA 92697-1000
USA

Your reference	Our reference	Phone Number	Date
	25/07.231/jtb	+3115 2783984	Sept.17,2002

Subject
The Academic Alliance

Subdivision
Industrial Design Engineering

Dear Mr. Clark,

On July 19, 2002 you sent a letter to professor Hennessey, which you addressed in Delft, the Netherlands. Prof. Hennessey, however, left for the USA in November 2001. We sent your letter to his new address in the USA, and for one week ago he sent it back to us, with the question to pore over your request.

About 35 years ago Industrial Design Engineering at the Delft University of Technology became an autonomous faculty of the called university. In the meantime we delivered more than 2500 masters in Industrial Design Engineering. For an overview of our education and research activities we like to present you the Quality Assessment IDE 1995-2000, and the report of the Review Committee.
Until this year, Industrial Design Delft was unique in the Netherlands at university level and with its research facilities. In this quality we built up an established reputation in Europe and overseas.

We very much sustain your plans to establish 'The Academic Alliance', and we are very much interested in participating in this Alliance. We hope we can contribute in steps there has to be taken to realize an agreement.

We would like to be involved in your further preparations and planning, so we ask you to keep us informed about the progress.
If you need any more information about the educational or research activities of Industrial Design Engineering at DUT, or you want to contact us for any other reason, you can call or email us: phone: +31152783004/ j.j.jacobs@io.tudelft.nl . (The educational director of the School of IDE, and vice-dean of the faculty).

Kindly yours,

Prof.ir. J.J.Jacobs
Vice-dean

014389-76

9.27.2002 Prof. Sir Christopher Frayling

ROYAL COLLEGE OF ART

RECTOR AND VICE-PROVOST
PROFESSOR SIR CHRISTOPHER FRAYLING

27 September 2002

Professor Richard N Taylor
Director
Institute for Software Research
University of California
Irvine
Irvine, CA 82697-3425
USA

Dear Richard

Can I express my full support for your School of Design proposal. Your division into the four areas of Interaction, Product, Spatial and Design Studies is neat, and flexible enough to cope with future developments. The size of the School - 800 students - exactly matches the size of the Royal College of Art - a manageable number, without becoming de-personalised. I think, too, that you have sensibly avoided the 'craft' subjects to concentrate on digital and product design: this will provide a good platform for interrogating 'objects' as well as producing them; also for coping with 'the space of places' and 'the space of flows'.

I congratulate you on a robust set of proposals - well thought-out, and aware of design developments world wide. The School bodes well.

With best wishes

Professor Sir Christopher Frayling
Rector

KENSINGTON GORE LONDON SW7 2EU · TEL: 020 7590 4101 FAX: 020 7590 4100

10.7.2002 Dr. Gülay Hasdogan

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY
MİMARLIK FAKÜLTESİ - FACULTY OF ARCHITECTURE
ANKARA - TURKEY

1956

Sayı / Ref : .....

Assoc Prof Dr Gülay Hasdoğan
Chairperson
Department of Industrial Design
Faculty of Architecture
Middle East Technical University
ODTÜ 06531 ANKARA
Tel: +90-312-2102214, Fax: +90-312-2101251
e-mail: hasdogan@arch.metu.edu.tr

Michael P. Clark,
Associate Executive Vice Chancellor for Academic Planning,
University of California, Irvine
Fax: (949) 824 2438

7.10.2002

Dear Mr. Clark,

Thank you for your letter dated 19July 2002 suggesting us to take part in the "Academic Alliance" for the new School of design to be established at the University of California, Irvine. We are indeed, interested to take part in the Alliance especially to facilitate student and staff exchange. Looking forward to discuss the details.

Yours sincerely,

Gülay Hasdoğan

Lütfen cevabi yazınızda Bölüm adı ve evrakımızın numarasını belirtiniz.
Please refer to our previous correspondence number together with the Department concerned.

Tel : (0312) 210 2201
Fax : (0312) 210 1108

10.9.2002 Prof. Pete Avondoglio

UMEÅ UNIVERSITY
Institute of Design
Pete Avondoglio

09 October 2002

Michael P. Clark
Associate Executive Vice Chancellor
509 Administration
Irvine
CA 92697-1000

Dear Michael Clark

Please excuse the late response to your enquiry of July 19. We have no summer term here and thus have just returned in September for this school year.
Professor Bengt Palmgren forwarded your letter to me, and as Chairman of the Study Coordination Committee here in Umeå, I am responsible for a reply.

We find your proposed program to be extremely exciting and well-timed. It is similar in spirit to what we are attempting to do here in Umeå, and thus we are very sympathetic about your intentions.

For years we have been trying to find an industrial design program in the states that had the goals and qualities you mention, as a collaboration partner. Thus your suggestion for an Academic Alliance would be in keeping with our goals and we are interested in hearing more as your program progresses.

The Umeå Design Institute has an extensive collaboration with many major European industries such as Volvo, Saab, Electrolux, Nokia, Eriksson, etc. and thus our approach is also both in academic and industrial contexts.

One point I might add that has caused problems earlier in terms of possible student exchanges, and that is in general, the Scandinavian schools are tuition-free as opposed to those in the States. This has in some cases been a detriment to Scandinavian students spending time at an American school.

Please keep us informed, and as stated, we are extremely interested in hearing more about the Alliance.

Kindest Regards

Pete Avondoglio
Professor, masters program leader
Advanced Product Design

Umeå University SE-901 87 Umeå. Telephone: +46-90-786 70 67 Telefax: +46-90-786 66 97. E-mail pete.avondoglio@dh.umu.se

10.10.2002 Prof. Jonathan Schroeder

VETENSKAP OCH KONST
KUNGL TEKNISKA HÖGSKOLAN

Royal Institute of Technology
Dept. of Industrial Economics and Management
Jonathan Schroeder, Ph.D.

Dr. Michael Clark
Associate Vice-Chancellor
Administration Building
University of California
Irvine, CA 92697
USA

October 10, 2002

Dear Dr. Clark,

This letter is in support of the Proposal for a School of Design at the University of California, Irvine. I am writing as a marketing professor in the Department of Industrial Economics and Management at the Royal Institute of Technology (KTH) in Stockholm, and a Visiting Professor in Marketing Semiotics at University Bocconi in Milan, where I teach in the Masters program in Fashion Experience and Design Management. My research and teaching intersect with issues of product design, design aesthetics, and visual studies, and I have published internationally in design, marketing, psychology, and law journals.

I think the proposal for a School of Design is excellent. Such a school reflects a much-needed integration of the interdisciplinary nature of design today. Furthermore, the role of design in Design Management and Product Design is tremendously important to management and society. This proposal outlines the growing global importance of connecting disparate university centers of design teaching and research in an intellectually stimulating and academically rigorous way. The proposed School of Design would make an immediate impact on global design studies.

I firmly believe that design is central to understanding management in the information society. Design scholarship is important to brand management, corporate identity, product design, web page design, and design management, to name a few central areas of research and practice. As management theorist Tom Peters, in his inimitable way, said recently:

> You can't be a leader in the next five years and not be totally into design. Design specs are the double helix DNA that sets the tone of the culture and establishes the operating ideas that embody the economy. They are your distinguishing characteristics, your brand's brand. (Tom Peters in *Fast Company,* March 2001).

Design is an important bridge between engineering and marketing, providing a useful interface between the technician and the consumer. In my experience of teaching and researching in the US and Europe, design has proved to be an excellent way to "get the

Postal address
Royal Institute of Technology
KTH - Indek
SE-100 44 Stockholm, Sweden

Visiting address
Drottning Kristinas Väg 35D
KTH Campus, Stockholm

Etcetera
Tel: +46 8 790 76 64 dir
Fax: +46 8 20 72 68
E-mail: jonathan@lector.kth.se

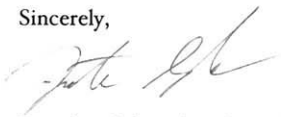
10.10.2002 Prof. Jonathan Schroeder (concluded)

conversation started" between various research areas, between engineers and managers, and between social scientists, humanists, and designers. Design research is necessarily interdisciplinary—drawing on expertise is such areas as information technology, philosophy, art and design, and psychology. Furthermore, many product design teams are multidisciplinary, developing a creative tension and synergy in the process of making ideas ready for the market.

The proposed School of Design would provide a fertile cross-disciplinary matrix for research that breaks new ground in important societal, scholarly, and managerial issues.

I strongly encourage the University of California to go forward with this proposal.

Sincerely,



Jonathan Schroeder Ph.D. (University of California, Berkeley)
Associate Professor, Director of Marketing

Postal address
Royal Institute of Technology
KTH - Indek
SE-100 44 Stockholm, Sweden

Visiting address
Drottning Kristinas Väg 35D
KTH Campus, Stockholm

Etcetera
Tel: +46 8 790 76 64 dir
Fax:+46 8 20 72 68
E-mail: jonathan@lector.kth.se

10.30.2002 Prof. Pierre Guillet de Monthoux

From: <pguille@attglobal.net>
To: <mpclark@uci.edu>
Subject: Hurrah for the new School of Design
Date: Wed, 30 Oct 2002 07:21:34 +0100

Concerning the project of a School of Design.

During the last decade we have been engaged in an extensive resreach program into management and the arts. The program has received considerable funding from the Swedish National Bank and the Research Council for Social Science. It has been seen as highly desirable to carry out this research, geared to aesthetic processes of production, marketing and oganization, at precisely the School of Business of the Stockholm University. The news that you are planning a School of Design therefore is good news for us. We would love to carry on the cooperation with your management scholars in this new and creative context. As far as we can understand this step would also be a very innovative action in the US academic context; something which our common research has been preparing and hoping for many years. It is really high time to inject an aesthetic understadning into management schools, and this has been long recongnized but till now, as far as we understand, not realized in the US. We, at Stockholm University, vividly support this project and wish it good luck in the future

yours sincerely

Pierre Guillet de Monthoux

chair of General Management at Stockholm University
and visiting professor of Art and Managment at Copenhagen business school.

ps
for sample of our hybridization of management, design and aesthetics go to www.arthistory.su.se/curator or see Guillet de Monthoux, The Art Firm- aesthetic management and metaphysical marketing from Wagner to Wilson. Stanford: Stanford University Press (forthcoming)

References

Archer, Bruce. (2000). A Background to Doctoral Awards. In Durling, David, and Friedman, Ken (Eds.). (2000). *Doctoral Education in Design: Foundations for the Future. Proceedings of the Conference at La Clusaz, France, 8-12 July 2000.* Staffordshire, England: Staffordshire University Press: 257-260.

Association of Collegiate Schools of Architecture. (2001). *Architectural Education—A Brief History.* Retrieved October 17, 2001, from http://www.acsa-arch.org/studentinfo/archeducation_history.html

Association of Professional Design Firms. (2002). APDF Home Page. Retrieved March 1, 2002, from http://www.apdf.org

Brunel University. (2001). Brunel Design Department. Retrieved November 14, 2001, from http://www.brunel.ac.uk/faculty/tech/des/design/design.html

Carnegie Mellon University. (2001). Master of Design in Interaction Design. Retrieved November 14, 2001 from http://www.cmu.edu/cfa/design/programs/mdes/mdes.html

Central Michigan University. (2001). CMU BS Vehicle Design. Retrieved November 15, 2001, from http://www.nucea.edu/vehicles.htm

Coleman, Roger. (2001). *Living Longer: The New Context for Design.* London: The Design Council.

Cooper Interaction Design. (2001). Cooper Interaction Design Home Page. Retrieved November 14, 2001, from http://www.cooper.com/

Corporate Design Foundation. (2002). Corporate Design Foundation Home Page. Retrieved February 21, 2002, from http://www.cdf.org/frameset.html

Cross, Nigel (Ed.). (1984). *Developments in Design Methodology.* New York: Wiley.

Cross, Nigel. (2000). Design as a Discipline. In Durling, David, and Friedman, Ken (Eds.). (2000). *Doctoral Education in Design: Foundations for the Future. Proceedings of the Conference at La Clusaz, France, 8-12 July 2000.* Staffordshire, England: Staffordshire University Press.

Council for Graduate Education. (1997). Practice-based Doctorates in the Creative and Performing Arts and Design.

de Vries, M.J., Cross, Nigel, and Grant, D.P. (1993). *Design Methodology and Relationships with Science*. Boston: Kluwer Academic Publishers.

Durling, David, and Friedman, Ken (Eds.). (2000). *Doctoral Education in Design: Foundations for the Future. Proceedings of the Conference at La Clusaz, France, 8-12 July 2000*. Staffordshire, England: Staffordshire University Press.

Enlow, C. (2000). Frank Gehry Rock Temple. *Architecture Week*, No. 9 (July 12). Retrieved October 17, 2001, from http://www.ArchitectureWeek.com/2000/0712/index.html

Fitch Worldwide. (2001). Fitch:Online Home Page. Retrieved October 17, 2001, from http://www.fitch.com/

Friedman, Ken. (1997). Design Science and Design Education. In McGrory (Ed.), *The Challenge of Complexity*. Helsinki: University of Art and Design: 21.

Friedman, Ken. (2000a). Creating Design Knowledge: From Research into Practice. In IDATER 2000 Conference Proceedings. Loughborough, England: Loughborough University.

Friedman, Ken. (2000b). Form and Structure of the Doctorate in Design. In Durling, David, and Friedman, Ken (Eds.). (2000). *Doctoral Education in Design: Foundations for the Future. Proceedings of the Conference at La Clusaz, France, 8-12 July 2000*. Staffordshire, England: Staffordshire University Press: 369-76.

Georgia Institute of Technology. (2001). The Ph.D. Program, COA at Georgia Tech. Retrieved October 17, 2001, from http://www.arch.gatech.edu/phd/

Gibney, Jr., Frank and Luscombe, Belinda. (2000). The Redesign of America. *Time* (March 20, 2000).

Gutman, Ernest M. and Gutman, Carolyn R. (1968). *Wheelchair to Independence*. Springfield, IL: Charles C. Thomas.

Hansen, F. (1974). *Konstruktionswissenshaft*. Munich.

Harvard University. (2001a). Harvard Design School Advanced Studies Program Doctor of Philosophy (Ph.D.). Retrieved October 17, 2001, from http://www.gsd.harvard.edu/academic/asp/phd.html

Harvard University. (2001b). Harvard Design School Programs of Study: Doctor of Design. Retrieved October 17, 2001, from http://www.gsd.harvard.edu/inside/registrar/register/degree_programs/ddes.html

Holt, Steven Skov (et al.). (2000). Beauty and the Blob: Product Culture Now. *Design Culture Now*: 21-24. Quoted in McCarron, Carolyn. (2000). A Matter of Degrees: The Ph.D. in Design. *Communications Arts November Design Annual 2000*. Also available on-line at http://www.commarts.com/CA/coldesign/carm_13.html

IDEO. (2001). About IDEO. Retrieved November 14, 2001 from http://www.ideo.com/about.htm

Illinois Institute of Technology. (2001a). Office of Institutional Research IIT Facts at a Glance. Retrieved October 17, 2001, from http://oiir.iit.edu/oiir/factbook/facts.html

Illinois Institute of Technology. (2001b). History of Illinois Institute of Technology. Retrieved October 17, 2001, from http://www.iit.edu/about/history.html

Illinois Institute of Technology. (2001c). Institute of Design:People:Faculty:Patrick Whitney. Retrieved October 17, 2001 from http://www.id.iit.edu/people/faculty_bios/whitney.html

Illinois Institute of Technology. (2002). Ph.D. Research: Dissertations. Retrieved February, 2002, from http://www.id.iit.edu/phd/dissertations.htm

Industrial Designers Society of America. (2002). IDSA Home Page. Retrieved March 1, 2002, from http://www.idsa.org

Interaction Design Institute. (2001). Retrieved November 14, 2001, from http://www.interaction-ivrea.it/index.asp

Internet Policy Institute. (2001). *Report of the National Workshop on Internet Voting: Issues and Research Agenda*. Sponsored by the National Science Foundation; conducted in cooperation with the University of Maryland and hosted by the Freedom Forum.

Justice, Lorraine. (2000). Problems and Benefits of Building a Research-based Design Curriculum. In Durling, David, and Friedman, Ken (Eds.). (2000). *Doctoral Education in Design: Foundations for the Future. Proceedings of the Conference at La Clusaz, France, 8-12 July 2000*. Staffordshire, England: Staffordshire University Press: 379-86.

Keeley, Larry. (2000). Quoted in McCarron, Carolyn. (2000). A Matter of Degrees: The Ph.D. in Design. *Communications Arts November Design Annual 2000*. Also available on-line at http://www.commarts.com/CA/coldesign/carm_13.html

Kim, Queena Sook. (2000). Building on Internet Time. *The Industry Standard* (May 8, 2000): pp. 256-60.

Knap, Chris. (2000). Soul on Wheels. *The Orange County Register* (April 10, 2000): p. Business-3.

Krippendorff, Klaus. (1999). A Field for Growing Doctorates in Design. In Buchanan, Richard H. (et al.). (1999). *Doctoral Education in Design: Proceedings of the Ohio Conference*. Pittsburgh: School of Design, Carnegie Mellon University: 207-24.

Linköpings universitet. (2001). Interaction Design Home Page. Retrieved November 14, 2001, from http://www.ida.liu.se/~id/

Loughborough University. (2001). Automotive Engineering at Loughborough University. Retrieved November 15, 2001, from http://www.lboro.ac.uk/prospectus/ug/programmes/eng/aae/auto.htm

Massachusetts Institute of Technology. (2001). *Massachusetts Institute of Technology Graduate Study in Architecture* (September): 18.

Massachusetts Institute of Technology Media Lab. (2002). MIT Media Lab Overview. Retrieved March 1, 2002, from http://www.media.mit.edu/about/overview.pdf

Melican, Jay, Barros, Izabel Falcao, Holguin, Roberto, and Joh, Jooyun Melanie. (1998). So, You're Going to Be … *a Doctor of Design*? Results of a Cross-Cultural Survey of Motivations for Pursuing a Ph.D. in Design. Retrieved March 1, 2002, from http://www.id.iit.edu/phd/survey/welcome.html

McCarron, Carolyn. (2000). A Matter of Degrees: The Ph.D. in Design. *Communications Arts November Design Annual 2000*. Also available on-line at http://www.commarts.com/CA/coldesign/carm_13.html

MetaDesign. (2001). MetaDesign Home Page. Retrieved November 14, 2001, from http://www.metadesign.com/main.htm

Murphy, Robert F. (1987). *The Body Silent*. New York: Holt.

National Association of Schools of Art and Design. (1996). Membership Categories. Retrieved November 12, 2001, from http://www.arts-accredit.org/nasad/memcat.html#institutional

Newman, Morris. (2000). Architects Becoming a Rare Breed in Their Own Field. *Los Angeles Times* (July 11, 2000): p. 11.

Newton, Sidney and Marhsall, Tim. (2000). Grounding Research in Practice. In Durling, David, and Friedman, Ken (Eds.). (2000). *Doctoral Education in Design: Foundations for the Future. Proceedings of the Conference at La Clusaz, France, 8-12 July 2000*. Staffordshire, England: Staffordshire University Press: 417-23.

Norman, Donald. (1989). *The Design of Everyday Things*. New York: Doubleday Currency.

Norman, Donald. (1993). *Things That Make Us Smart: Defending Human Attributes in the Age of the Machine*. Reading, MA: Addison-Wesley.

Null, Roberta L. and Cherry, Kenneth F. (1996). *Universal Design: Creative Solutions for ADA Compliance*. Belmont, CA: Professional Publications.

Perrow, Charles. (1999). *Normal Accidents: Living with High Risk Technologies*. Princeton, NJ: Princeton University Press.

Petroski, Henry. (1992). *To Engineer is Human: The Role of Failure in Successful Design*. New York: Vintage Books.

Petroski, Henry. (1994). *Design Paradigms: Case Histories of Error and Judgment in Engineering*. Cambridge, England: Cambridge University Press.

Preiser, Wolfgang F.E. and Ostroff, Elaine. (2001). *Universal Design Handbook*. New York: McGraw-Hill.

ProQuest Information and Learning Company. (2001). About ProQuest Digital Dissertations. Retrieved December, 2001, from http://wwwlib.umi.com/dissertations/

Redmond, John. (2000). Research by Design. In Durling, David, and Friedman, Ken (Eds.). (2000). *Doctoral Education in Design: Foundations for the Future. Proceedings of the Conference at La Clusaz, France, 8-12 July 2000.* Staffordshire, England: Staffordshire University Press: 463.

Richardson, Deane. (2000). Quoted in McCarron, Carolyn. (2000). A Matter of Degrees: The Ph.D. in Design. *Communications Arts November Design Annual 2000*. Also available on-line at http://www.commarts.com/CA/coldesign/carm_13.html

Saari, Donald G. (2001). *Chaotic Elections! A Mathematician Looks at Voting*. Providence, RI: American Mathematical Society.

Sato, Keiichi. (2000). Constructing Knowledge of Design, Part 1. In Durling, David, and Friedman, Ken (Eds.). (2000). *Doctoral Education in Design: Foundations for the Future. Proceedings of the Conference at La Clusaz, France, 8-12 July 2000.* Staffordshire, England: Staffordshire University Press: 136.

Sato, Keiichi and Whitney, Patrick. (2001). IIT. *Interactions* (March–April): 93-97.

Simon, Herbert A. (1969). *The Sciences of the Artificial*. Cambridge, MA: MIT Press.

Simon, Herbert A. (1981). *The Sciences of the Artificial* (2nd Edition, revised and enlarged). Cambridge, MA: MIT Press.

Swim Interaction Design Studio. (2001). Overview. Retrieved November 14, 2001, from http://www.swimstudio.com/html/about/overview.html

Tellefsen, Brynjulf. (2000). Cross-functional and Interdisciplinary Integration for Doctoral Education in Design: Theory and Experience. In Durling, David, and Friedman, Ken (Eds.). (2000). *Doctoral Education in Design: Foundations for the Future. Proceedings of the Conference at La Clusaz, France, 8-12 July 2000.* Staffordshire, England: Staffordshire University Press: 483-91.

The Design Council. (2000). *Design in Britain*. London: The Design Council.

UC Irvine Ad Hoc Committee on Design. (2000). *Report of the Ad Hoc Committee on Design*.

Umea University. (2001). Umea Institute of Design, Industrial Design Education. Retrieved November 14, 2001, from http://www.dh.umu.se/~id/

United States Department of Labor. Bureau of Labor Statistics. (2001). *Occupational Outlook Handbook*. "Designers." Retrieved January 30, 2002, from http://www.bls.gov/oco/ocos090.htm

University of California, Berkeley. (2002a). Canny EECS Colloquium. Retrieved February 22, 2002, from http://buffy.eecs.berkeley.edu/Chair/cannya.html

University of California, Berkeley. (2002b). Virtual Development Center Berkeley Institute of Design. Retrieved February 22, 2002, from http://buffy.eecs.berkeley.edu/Programs/VDCBID.html

University of Florida. (2001). Doctoral Program for Design, Construction, and Planning. Retrieved October 17, 2001, from http://www.dcp.ufl.edu/academics/DoctoralProgram.htm

University of Limerick. (2001). The Interaction Design Centre at the University of Limerick. Retrieved November 14, 2001, from http://www.ul.ie/~idc/

University of Minnesota. (2001). College of Human Ecology—Design, Housing, and Apparel Home Page. Retrieved November 14, 2001, from http://www.che.umn.edu/dha/frameset.html

University of Michigan. (2001). Automotive Engineering at the University of Michigan. Retrieved November 15, 2001, from http://auto.engin.umich.edu/

Warfield, James. (1983). Culture and Architecture: Cultural Responsiveness in a Global Society. *Reflections* 1(1): 58-69.