Statement of Scholarly Accomplishments

Summary of Research accomplishments

Since joining Architectural Studies as a tenure-track faculty member in the fall of 2005, I have authored 11 journal articles; eight have been published and three are currently under peer-review at leading journals. These articles are based on several of the 24 papers and two books that I have authored and presented at international conferences since coming to Missouri. Nine former or current MU students and six international visiting scholars whom I served as hosting faculty are credited as co-authors on this research. In 2007, I received the Research Enrichment and Dissemination Award sponsored by the Interdisciplinary Center of Aging.

Significance of Design Visualization with Digital Media Research

Advances in digital technology have engendered unprecedented improvements in the emerging field of design visualization. Design visualization with digital media helps people explore and explain design through computing systems that provide an interactive visual representation. Any design problem is considered a problem of a lack of information (Negroponte), and digital media allows significant opportunities for design educators, practitioners, and researchers to better address, comprehend and communicate design contents. My research in design visualization with digital media involves how people interact with digital media for design. In addition, it considers how different features of digital visualization, as well as the simulated environment itself, affects the way people think and feel.

Interdisciplinary Research Interests in Design Visualization with Digital Media

By nature, my research is interdisciplinary, including fields that study human-computer interaction and design with digital media. In the first two to three years since I joined the tenure-track faculty, much effort has been made to set up an experimental research environment including hardware/software for three-dimensional (3D) interactive simulations. In the Virtual Reality lab (now iLab: Immersive Lab) where this research takes place, we employ a range of research methods derived from studies in environmental behavior, cognition, and information technology. I have tried to expand knowledge in the discipline by introducing interdisciplinary approaches to research problems relevant to interior design and design studies in general. The research I have published to date has examined features associated with digital media and users of digital media: user characteristics—a sense of presence, visual cognitive styles, gender; and digital media characteristics—two-dimensional (2D), interactive 3D, stereoscopic 3D. These variables were often understood in combination with environmental design topics such as color environments, crowding, and furniture choices.
The diagram below illustrates my current and future research interest areas in design with digital media. Research questions have been and continue to be formulated within this context. In addition to my interdisciplinary backgrounds in design and human-computer interaction, I have been working collaboratively with colleagues from computer science, communication, hotel and restaurant management, and business.

1. **User characteristics/individual differences**: The designer and the design viewer as users of technology will have differing interaction experience due to their innate characteristics and individual histories with technology. For instance, an interior walk-through simulation using a 3D gaming engine may be effective and more satisfying for those who have more gaming experiences. [1-3]

2. **Culture/group characteristics**: Often experiences are influenced by unique characteristics of the group to which the users belong, such as generation, gender, or culture. Identifying such characteristics associated with user experience can provide useful information to better understand the role of technology and individual differences. [4-7]

3. **Design computing: technology for design communication**: Rapidly advancing computer and network technology brings new possibilities for design education, research, and practice. I believe that introducing, developing, and testing innovative systems to improve the design process, learning, and review is one of the areas where design researchers with technology backgrounds can directly contribute to the community. [8-12]

4. **Human-computer interface issues**: With the variety of computer graphic applications, input devices, and display systems available today, whether, how, and to what extent the technology benefits users are often not
understood. By empirically testing usability and acceptance of technology, we can better understand the meaning of digital media in various design contexts. [13-18]

5. User experience with the designed environment: In the field of interior design and environment-behavior studies, much research has tended toward two extremes: either very theoretical or very practical. Although theory has much to offer practitioners, a good way to validate the assumptions of any theoretical framework is through empirical studies that produce evidence. Empirical data from studies on user experience of a digitally represented environment can have significant implications for interior design and related fields. [3, 8, 19-21]

Future Goals

To this point, my published research has been mostly supported by various grants, indicating it is of practical value to reviewers. I believe that I already have made tremendous progress in acquiring an experimental research environment and am well positioned for the next steps in the pursuit of external funding opportunities. Human-computer interaction and design research is a rapidly growing area of interdisciplinary research with various grant programs available, including the National Science Foundation’s Science of Design and Creative IT program.

References


