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Guest Editors' Introduction

CREATIVITY AND RATIONALE IN SOFTWARE DESIGN

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Creativity and rationale are two lenses for looking at design. Obviously, design is about envisioning new artifacts and experiences through the embodiment of new ideas. But design also is clearly about understanding reasons and balancing trade-offs in order to develop new artifacts and experiences that are desirable and effective, and not merely novel. Because disciplines and predilections tend to fragment and specialize human activity, it can appear that creativity and rationale are about fundamentally different endeavors, although both happen to be known as *design*. This is profoundly unfortunate; to the extent that such a dichotomy prevails, it more or less ensures that no adequate treatment of design can emerge.

The possible disconnection between creativity and rationale in conceptualizing design evokes the image of Janus: two faces looking in opposite directions, unlikely to ever see the same thing, or to see enough in common to make integrative sense of anything. A more inspiring image might be that of the Taijitu symbol for yin and yang, smoothly integrated opposites flowing into one another, and depending upon one another for their meaning.

The Workshop

During June 15-17, 2008, a diverse group of designers and design researchers met at Penn State University to exchange perspectives and approaches, to articulate and develop new research ideas and hypotheses, and to reconsider and reconstruct prior work and results toward new research directions.

The workshop included thought leaders from several software design research communities: human–computer interaction design, sociotechnical systems design, requirements engineering, information systems, and artificial intelligence. The attendees were Mark Ackerman, University of Michigan; Eli Blevis, Indiana University; Janet Burge, Miami University of Ohio; John Carroll, The Pennsylvania State University; Fred Collopy, Case Western Reserve University; John Daughtry, The Pennsylvania State University; Umer Farooq, The Pennsylvania State University; Gerhard Fischer, University of Colorado; Jodi Forlizzi, Carnegie-Mellon University; Batya Friedman, University of Washington; John Gero, George

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Mason University; Steve Harrison, Virginia Tech; Sal March, Vanderbilt University; Raymond McCall, University of Colorado; Rosalie Ocker, The Pennsylvania State University; Colin Potts, Georgia Institute of Technology; Mary Beth Rosson, The Pennsylvania State University; Al Selvin, the Open University and Verizon; Alistair Sutcliffe, University of Manchester; and Deborah Tatar, Virginia Tech.

The workshop premise was that creativity and rationale should not be disjoint worldviews, and that coordinating and integrating them is key to having more effectively reflective design practices, which in turn is absolutely essential to a serious science of design. Like most workshops, this one ended up posing, but leaving open, many questions, as well as identifying projects that ought to be undertaken, but have not yet been started.

This Special Issue

A key objective of the workshop was to facilitate longer term processes of scholarly interaction toward the development of more refined proposals, analyses, and results. One means of advancing this objective involves scholarly publishing. This issue is the second of a two-part special issue on Creativity and Rationale in Software Design; the first installment appeared as Volume 6, Number 1, of *Human Technology: An Interdisciplinary Journal on Humans in ICT Environments* in May 2010. For more extensive introductory framing, please see Carroll (2010).

The four papers in this issue examine the relationships and synergies between creativity and rationale in software design at different levels of analysis. The first paper "Achieving Both Creativity and Rationale: Reuse in Design with Images and Claims," by McCrickard, Wahid, Branham and Harrison, addresses the technical issue of reuse: Designs are almost never ab initio; they typically are based upon prior designs. McCrickard et al. operationalize rationale as the explicit articulation of values and trade-offs implicit in a design, and investigate how to encourage the reuse of rationale toward better designs and greater creativity.

Farooq and Carroll, in "Supporting Awareness in Creative Group Work by Exposing Design Rationale," address the level of small design teams and the challenge of maintaining team activity awareness in producing a creative collective outcome. For example, team members must monitor the development of key ideas across the team in order to be able to coordinate their own contributions, and to communicate with their teammates. Farooq and Carroll investigate the consequences of sharing rationales around work activities through status updates in a collaborative environment to support overall team awareness.

In the third paper, "Mining Creativity Research to Inform Design Rationale in Open Source Communities," Burleson and Tripathi investigate the role of rationale in open source communities. This is an interesting paradigm of software and do-it-yourself development with respect to creativity, since membership in open source communities is voluntary. Burleson and Tripathi describe practices of these organizations that cultivate informal rationale, specifically enabling them to codify knowledge from recent project activities and to apply that knowledge in future projects.

Fischer and Shipman, in the final paper, "Collaborative Design Rationale and Social Creativity in Cultures of Participation," address the succession of cultural paradigms, from a *consumer culture,* in which people are users and relatively passive with respect to designs, toward *cultures of participation*, in which users are designers and redesigners. In this view, it

is possible, indeed necessary, for design rationale to be articulated by and accessible to anyone and everyone. Moreover, it is permitted, indeed expected, that everyone's creative contributions can be heard and considered in addressing the widest variety of contemporary design problems. Fischer and Shipman argue that the emergence of cultures of participation provides new ways to reconcile creativity and design rationale.

REFERENCES

Carroll, J. M. (2010). The essential tension of creativity and rationale in software design [Special issue on Creativity and Rationale in Software Design]. *Human Technology: An Interdisciplinary Journal on Humans in ICT Environments, 6,* 4–10.

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