

Design Computing and Cognition '14

John S. Gero • Sean Hanna
Editors

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 Springer

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Preface

Research develops new knowledge, but design has to act. In science, as in the humanities, we have the luxury of holding our theories as tentative, admitting they will eventually be superseded by new evidence or argument. But design decisions must always be made even though our knowledge of the situation is always incomplete, as design problems are by nature ill-defined, unique, and ‘wicked’. Since it also deals in propositions rather than explanations, design itself is at risk of being misunderstood in the context of traditional academic research; yet it is the crucial activity that puts into practice the research and knowledge gained across the arts, humanities, sciences and social sciences. This deep cross-disciplinarity is what makes a conference like *Design Computing and Cognition* so valuable, as it brings together those who study human cognition and those who model it with a machine, those who try to understand what designers do and those who help them to do it better.

The activity of design has always been with us. It features in the earliest surviving literature we have: the *Epic of Gilgamesh*, for example, features 4,000 year old design commentary on cities and a flood-proof ark, and the *Instructions of Shuruppak*, perhaps the oldest text in the world, begins with directions for urban and rural planning. What is being designed is changing drastically. The kinds of objects, systems and environments that are now created by design, from cities to global manufacturing networks and virtual environments, are of unprecedented scale. We are compelled to deal with rapid changes in technologies, and coordinate work across continents and time zones. These are scales at which our normal intuition and experience do not function. As the scale and speed of production of such designed outputs increase, so do their impacts, and along with it the importance of making informed decisions in design.

It is this change that makes research in design both so urgent and so interesting. At the same time that we are required to design entire cities, devices and services virtually overnight, the technology is also emerging to handle the ‘big data’ through which we might achieve an understanding of the nexus between design and

consumer. As designers become more enabled by—and embedded in—computational tools, neuroscience and cognitive science are seeing deeper into their brains. For the past decade, this conference series has provided a bridge between the fields of design computing and design cognition. The confluence of these two fields continues to provide the foundation for further advances in both and to an increased understanding design as an activity whose influence continues to spread.

The papers in this volume are from the *Sixth International Conference on Design Computing and Cognition (DCC '14)* held at University College London, UK. They represent the state-of-the-art of research and development in design computing and design cognition. They are of particular interest to researchers, developers and users of advanced computation in design and those who need to gain a better understanding of designing.

In these proceedings the papers are grouped under the following nine headings, describing both advances in theory and application and demonstrating the depth and breadth of design computing and design cognition:

- Design Synthesis
- Design Cognition
- Design Creativity
- Design Processes 1
- Design Theory
- Design Grammars
- Design Support
- Design Processes 2
- Design Ideation

A total of 131 full papers were submitted to the conference, from which 38 were accepted and 37 appear in these proceedings. Each paper was extensively reviewed by at least three reviewers drawn from the international panel listed on the following pages. The reviewers' recommendations were then assessed before the final decision on each paper was taken, and the authors improved their contributions based on the advice of this community. Thanks go to them, for the quality of these papers depends on their efforts. Thanks also go to Pinelopi Kyriazi for putting the papers together into a single volume.

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