

Preface

Design has become a fruitful research area for cognitive scientists and computer scientists, not only for design scientists. For cognitive scientists it represents a particularly rich and open environment within which to study complex human behavior. For computer scientists it represents a challenging area. For design scientists the tools to study and model designers are only now becoming available. For neuroscientists design is largely a novel domain.

Design involves the creation of worlds and entails the interaction between minds and the representations of artefacts they produce. This opens a variety of areas for study since designers work with or without external tools, operate solely or within teams, and collaborate with others who are co-located or at a distance. Designers use external symbol systems extensively, particularly sketches, which implies a high engagement of visual and spatial reasoning.

Visual and spatial reasoning often play pivotal roles in design creativity, most noticeably through sketches, diagrams, visualization and visual imagery. There is research on visual and spatial reasoning in multiple disciplines but very little is focused on design creativity. It was to this gap that an NSF-funded workshop was organized in Provence, France to provide a forum to allow researchers in disparate disciplines to be exposed to the other's research methods and research results within the context of design creativity.

Representatives of the four disciplines of design science, computer science, cognitive science and cognitive neuroscience were invited to present and discuss their research and research methods. The workshop was structured so that the bulk of the time was spent on discussion. The four sessions leaders were:

- Design Science: Ramesh Krishnamurthi
- Computer Science: Christina Freksa
- Cognitive Science: Barbara Tversky
- Neuroscience: Jeff Zacks

The workshop provided a unique forum that brought together researchers from design science, computer science, cognitive science and cognitive neuroscience who were studying visual and spatial reasoning in their own ways, within an overarching framework of studying design creativity.

This volume contains fifteen of the papers presented and discussed at the workshop.

Pinelopi Kyriazi assisted in bringing the papers in this volume into a uniform whole, special thanks go to her. I would also like to thank Nathalie Jacobs, Anneke Pot and Cynthia Feenstra from Springer for all their assistance in bringing this volume to publication.

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Studying Visual and Spatial Reasoning for Design
Creativity

Gero, J.S. (Ed.)

2015, X, 267 p. 80 illus., 40 illus. in color., Hardcover

ISBN: 978-94-017-9296-7