Artificial Intelligence in Design '00

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Edited by

John S. Gero

Key Centre of Design Computing and Cognition,
University of Sydney,
Australia

SPRINGER SCIENCE+BUSINESS MEDIA, B.V.

A C.I.P. Catalogue record for this book is available from the Library of Congress.

ISBN 978-94-010-5811-7 ISBN 978-94-011-4154-3 (eBook)
DOI 10.1007/978-94-011-4154-3

Printed on acid-free paper

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Preface

Designing is one of the foundations for change in our society. Its genesis is the notion that the world around us either is unsuited to our needs or can be improved. The need for designing is driven by a society's view that it can improve or add value to human existence beyond simple subsistence. As a consequence of designing the world which we inhabit is increasingly a designed rather than a naturally occurring one. In that sense it is an "artificial" world. Designing is a fundamental precursor to manufacturing, fabrication and construction. Design research aims to develop an understanding of designing and to produce models of designing that can be used to aid designing.

Design research can be carried out in variety of ways. It can be viewed as largely an empirical endeavour in which experiments are designed and executed in order to test some hypothesis about some design phenomenon or design behaviour. This is the approach adopted in cognitive science. It often manifest itself through the use of protocol studies of designers. A second view is that design research can be carried out by positing axioms and then deriving consequences from them. If the axioms can be mapped onto design situations then the consequences should follow. This is the approach adopted in mathematics and logic. A third view, and the most common one in the computational domain is that design research can be carried out by conjecturing design processes and constructing computational models of those processes and then examining the behaviours of the resulting computational systems. Artificial intelligence in design research utilises all three approaches.

The papers in this volume are from the Sixth International Conference on Artificial Intelligence in Design *(AID'00)* held in Worcester, Massachusetts, USA. They represent the state-of-the-art and the cutting edge of research and development in this field. They are of particular interest to researchers, developers and users of advanced computation in design. The contents of this volume demonstrate both the depth and breadth of the artificial intelligence paradigm in design. They point the way for the development of advanced computer-based tools to aid designers. The papers describe both advances in theory and application.

The thirty-four papers are grouped under the following headings:

Design Theory
Knowledge Modeling
Knowledge Management for Design
Shapes in Design
Evolutionary Systems In Design
Process-Based Reasoning in Design
Case-Based Reasoning in Design
Learning in Design
Exploration and Generation in Design
Context in Design
Agent-Based Design Systems

All papers were extensively reviewed by three referees drawn from the large international panel of referees listed earlier. Thanks go to them, for the quality of these papers depends on their efforts. The reviewers' recommendations were then assessed before a final recommendation was made.

Particular thanks go to Anne Christian who took what should have been consistently formatted submissions but were not, and turned them into a coherent whole – no mean effort. The final manuscript bears her mark.

John S. Gero
University of Sydney
February 2000