Artificial Intelligence in Design'02

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PREFACE

One of the foundations for change in our society comes from designing. 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 well 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, construction or implementation. Design research aims to develop an understanding of designing and to produce models of designing that can be used to aid designing.

Artificial intelligence has provided an environmental paradigm within which design research based on computational constructions, can be carried out.

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 manifests itself through the use of protocol studies of designers. The results of such research form the basis of a computational model. 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 and forms the basis of a small but powerful area in design research. 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 Seventh International Conference on Artificial Intelligence in Design *(AID'02)* held in Cambridge University, UK. They represent the state-of-the-art and the cutting edge of research and development in artificial intelligence in design. They are of particular interest to researchers, developers and users of advanced computation in design.

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 the artificial intelligence paradigm in design:

Design Synthesis
Frameworks for Design
Spatial Synthesis and Analysis
Conceptual Knowledge in Design
Learning from Human Designers
Evolutionary Approaches in Design
Knowledge Support for Design
Systemic Support
Components in Design and Design Models

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 the final recommendation was made.

Anne Christian deserves particular thanks for it was she who took what should have been consistently formatted submissions but were not, and turned them into a coherent whole – no mean effort. The final quality of the manuscript bears her mark.

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and
Massachusetts Institute of Technology
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