

Preface

The Cambridge Workshops on Universal Access and Assistive Technology (CWUAAT) are a series of workshops held at a Cambridge University College every two years. This volume: “DESIGNING INCLUSIVE SYSTEMS” comes from the 6th in this series of highly successful events. The workshops are characterised by a single session running over three days in pleasant surroundings with delegates from home and abroad staying on site. Feedback suggests that allowing speakers longer presentation times, carrying discussion on through sessions into plenaries and shared mealtimes generates a highly cooperative and creative academic environment that is both enjoyable and informative.

The workshop theme: “Designing inclusion for real-world applications” refers to the emerging potential and relevance of the latest generations of inclusive design thinking, tools, techniques and data, to mainstream project applications such as healthcare and the design of working environments. Inclusive Design Research involves developing tools and guidance enabling designers to design for the widest possible population, for a given range of capabilities. In the context of demographic changes leading to an increasing number of older people, the general field of inclusive design research strives to relate the capabilities of the population to the design of artefacts, environments and technology by better characterising the user and the task demand. Inclusive populations of older people, for example, contain a greater variation in sensory, cognitive and physical capabilities. These variations may be co-occurring and rapidly changing leading to a demanding design environment.

Previous research developments in inclusive design have addressed issues of matching product and task demand to users’ capabilities in the context of simple daily living activities or specific products. New research developments are now extending the scope of the inclusive design approach into real-world applications by forming interdisciplinary links with systems engineering, industrial product design, healthcare and medical device design as well as education, policy development and architecture. This is a necessary stage of research because once design techniques and materials are fully developed for knowledge transfer, a

proving ground is required in real-world application and industry. This proving ground then tests the impact made by the original research.

As in the previous years, this book contains the best reviewed papers invited for oral presentation. The papers that have been included were selected by blind peer review carried out by an international panel of currently active researchers. The chapters forming the book represent an edited sample of current national and international research in the fields of inclusive design, universal access, and assistive and rehabilitative technology.

In the 2012 workshop, as well as the typical Inclusive Design themes of measuring demand and capability; emergent technologies, and design for inclusion, there has also been more focus on new themes such as cognitive interaction with new technologies, architecture, and healthcare. This reflects the newly developing transdisciplinary perspectives and ongoing research agendas. For example, can medical and neuroscientific models of thinking impairment be harmonised with functional descriptions to assist more inclusive design? Is it possible to motivate older generations to use modern healthcare software by better understanding the psychology of human motivation? Can we identify and quantify the differences between designers' and users' mental models of a product? In addition, researchers are increasingly investigating how public policies; both from governments and international non-governmental organisations, influence inclusive and accessible design, as well as the usage and adoption of assistive technology by individuals. Healthcare is a forcing domain: how can we provide architects with sufficient evidence to enable them to design healthcare buildings that better anticipate the needs of patients lying in a hospital bed?

For this CWUAAT we have extended the editorial panel to include two esteemed colleagues, Ann Heylighen from KU Leuven in Belgium, and Jonathan Lazar from Towson University in the US. This reflects the growing importance of particular interdisciplinary fields such as inclusive architecture, and public policy related to inclusive design, to the CWUAAT workshops. It also acknowledges the substantial international contributions that have been made over the series.

There are five main themes:

- I. *Designing for the Real-world* addresses the application of Inclusive Design techniques in healthcare, public facilities and services, and hazardous traditional industries;
- II. *Measuring Demand and Capabilities* looks at ways of measuring capability-demand relationships for actual tasks, software, devices and buildings;
- III. *Designing Cognitive Interaction with Emerging Technologies* draws together a number of threads related to cognition including the alignment of design and user mental models, motivating older users and unifying models of cognitive impairment;
- IV. *Design for Inclusion* is a space specifically for design issues in inclusive design, from sampling through to policy and novel new ways to inform the designer about inclusive design features;

- V. *Designing Inclusive Architecture* highlights specific cases, such as inclusive heritage, architecture for dementia and virtual environment tools for design.

In the tradition of CWUAAT, we have solicited and accepted contributions over a wide range of topics, both within individual themes and also across the workshop's scope. We ultimately hope to generate more interdisciplinary dialogues based on focused usage cases that can provide the discipline necessary to drive further novel research, leading to better designs. The aim is to impact industry and end-users as well governance and public design, thereby effectively reducing exclusion and difficulty in people's daily lives and society.

We would like to thank all those authors and contributors who have submitted to CWUAAT 2012 and to the preparation of this book. Many thanks are also due to the reviewing members of the Programme Committee who continue to support the workshop series. Finally, thanks are particularly due to Mari Huhtala and Suzanne Williams, who both play a key role in bringing the resulting publication to fruition between final submission and the Workshop itself. As in previous years, we are grateful to the staff at Fitzwilliam College for their patience and service.

*Pat Langdon, John Clarkson, Peter Robinson
Jonathan Lazar and Ann Heylighen*

*The CWUAAT Editorial Committee
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