

Guest Editorial

IWC Special Issue in

Human Factors and Interaction Design for Critical Systems

Although the two fields are closely related, there are critical differences in approaches.

Interaction designers typically seek to shape, create and explore future solutions, whereas HF researchers seek to operationalise social, psychological and behavioural theory to optimize design, often with constraints, such as error-free interaction, generally for skilled workers. Human Factors work has a long tradition in the workplace, often concerned with dangerous and critical activities performed by skilled operators, whereas Interaction Design is increasingly focused on the huge market of discretionary consumers, often concerned with the likes and dislikes of people.

When focused on common problems, however, HF and ID should be complementary, but of course there is a need to understand how best to achieve this. In the worst case, designers make things that are just *attractive* (increasing profit, which marketing likes), whereas human factors experts make things that are just *reliable* (decreasing risk, which lawyers like). We need both, and a wider perspective than "just"!

These two forces seem to be splitting HCI.

HCI it is either UX and fun or technical and industrial. The dominance of social media and consumer products makes UX seem “natural” to many, but it may be inappropriate or misleading in critical applications. Our heritage of thinking in HCI, such as the Nielsen/Shneiderman guidelines, was established before this split became apparent.

This special issue of *Interacting With Computers* focuses on the relation, tensions and trade-offs between HF and ID specifically in healthcare domains, aiming to effectively support design practice and research by showcasing the use of human factors/studies of human performance during the design, evaluation and use of interactive devices (e.g., findings relating to human error, cognitive performance and perceptual-motor control).

We selected five papers for this special issue after a rigorous peer review process, as well as hosting an international workshop, the International Symposium on Interaction Design and Human Factors, in 2014 that we held in Kochi, Japan (see <http://idhf.xrenlab.com>) where many of the papers now in this issue were presented and exposed to critical discussion.

The paper by Xiaojuan Ma investigated user ability of comprehending pictorial representations of medical conditions and accordingly proposed design guidelines for a visual vocabulary of electronic medical information to improve health literacy. The paper by Grace Begany et al. analysed human factors affecting user perception of search interfaces (e.g., in medical systems) through voice and touch gesture input and textual input, such as familiarity with the interface. Based on the understanding of human motor control ability of interacting with large displays, Kibum Kim et al. proposed a novel technique to aid elder people in remote target selection on large touch screens. Aiming to reduce number transcription errors in medical device interaction, Huawei Tu et al. explored user perception of number-based graphical representations for entry error detection. Frank Soboczenski et al. also investigated the robustness of perceptual interference effect (i.e., the numbers to be entered are presented in a hard to read form) in the context of a distracting environment and they showed that using this method could reduce number entry errors.

This special issue provides a snapshot into the field taken at a particular point in time. Moreover, due to the page limitations of a single Special Issue volume, it can only include a relatively small number of papers. As a result, its coverage is by no means complete despite our best efforts.

Many individuals contributed to the success and importance of this exciting Special Issue. We take this opportunity to thank all the authors for their submissions. We also appreciate a small army of referees (the list is below) who have put in much hard work and the long hours to review each paper in a timely and professional way. Our Editorial Assistant, Dr Alison Bentley, provided enormous and valuable assistance. We are also indebted to the Editor-in-Chief, Dr Dianne Murray, for offering us this opportunity and for patiently waiting the completion of the special issue. Most of all, we are indebted to you — the people who will read these papers and take the work forward to improve the world in new ways.

Huawei Tu, Nanjing University of Aeronautics and Astronautics, China

Paolo Masci, Queen Mary University of London, U.K.

Chris Vincent, University College London, U.K.

Yunqiu Li, Swansea University, U.K.

Harold Thimbleby, Swansea University, U.K.

Referee List:

Kimberly Barchard

Duncan Brumby

Kentaro Go

Kenneth Holmqvist

Yunqiu Li

Gerrit Niezen

Patrick Oladimeji

Matthew Purver

Frode Sandnes

Li Yau Wai Simon

Frank Soboczenski

Katarzyna Stawarz

Harold Thimbleby

Huawei Tu

Christopher Vincent

Yongtian Wang

Sarah Wiseman

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