The Interaction Design Centre, Middlesex University

Richard Butterworth, Ann Blandford & Paul Curzon

Interaction Design Centre
School of Computing Science
Middlesex University
Bounds Green Road
London N11 2NQ, UK
Tel: +44 20 8362 6163
Fax : +44 20 8362 6411

ABSTRACT

We present the work of the Interaction Design Centre at Middlesex University. The group has three main areas of activity : digital libraries, formal methods for HCI, and personal technologies.

KEYWORDS : Laboratory overview. Interation Design Centre

INTRODUCTION

The Interaction Design Centre (IDC) was established in 1996 by Harold Thimbleby and Ann Blandford. It exists now as an umbrella group for a broad collection of user-centred research projects. Although the IDC does not enforce any particular creed on its researchers the 'brand' of HCI that has been pursued is theoretically based and principled. Much of the work has addressed the question of scientific abstractions of HCI issues, and yet the motivation of the work has been practical. In many cases projects have been undertaken that have concurrently looked at HCI theory along with methodologies that allow theory to be applied to real systems by real developers.

The IDC has grown into a significant research group, with fifteen full time academics, five research assistants, and six PhD students. Seminars and less formal meetings are held regularly to provide mini-tutorials and presentations of proposed or on-going work.

We have attracted substantial funding from EPSRC, other government funding agencies, and internally from Middlesex University. We also work with a wide range of commercial and external partners: BT, Reuters, Royal Society of Arts, Praxis, Microsoft Research, Orange Plc, Waikato University, St Albans School, the NHS, The University of York, Leeds University and Hertfordshire University.

PROJECTS

The projects undertaken by the IDC can be broken into three broad, non-exclusive categories:

Digital Libraries

We are conducting extensive user centred investigations into several aspects of digital library use. Digital libraries form a interesting, challenging, yet bounded collection of case studies to which existing HCI theory and models can be applied in order to test and scope those theories. Hence our overall aim is twofold: to improve the design of digital libraries by the application of principled HCI approaches, and to improve the principled HCI approaches by grounding them more firmly in empirical evidence.

We have strong and valuable links with The University of Waikato in New Zealand; we collaborate with them on the development of the 'Greenstone' software which delivers digital library content and we also host a mirror site for the New Zealand Digital Library.

Blandford, Thimbleby and Stelmaszewska are investigating the Interaction Framework (IF) modelling technique by application to digital library examples. The aim of this work is to both refine IF and also come to a better understanding of digital library usability [4]. Considering in particular the usability of multimodal interfaces to libraries, they are applying the EMU approach to evaluating multimodal usability, which has been developed by Hyde, a PhD student in the group. In parallel, Theng is leading a team investigating how user centred design methodologies can be scoped specifically so that they can help digital library designers make better usability decisions about the implementation of library systems.

Blandford and Adams are looking at the social factors involved in the introduction of digital library technology: how the technology impacts upon organisational issues and wider aspects in the workplace. Current work in this area is addressed at hospitals and educational institutions [1]. Duncker, Thomas and Gwynn are also engaged in studies of digital libraries from a cultural standpoint: investigating the extent to which culture effects the conceptualisation and use of a digital library.

Theng has also been investigating digital libraries for children and how a digital library system can be used in an educational setting, recruiting the children as active designers [8].

Formalisms for Interaction

A major strand for the IDC has been the study of how mathematically expressed models and abstractions can be used to improve the understanding and design of interactive systems. The work of Blandford and Butterworth on Programmable User Modelling Applications (PUMA) investigated the extent to which existing cognitive theory could be usefully abstracted, formalised and scoped for the modelling of interactive systems [2,5]. As well as a heavily theoretical strand, PUMA also applied those theoretical bases to the real world design of safety-critical interactive systems. Fields [7] has also been investigating issues in the design of safety critical systems using rigorous techniques. The work of PUMA has been developed by Curzon so that classes of user error can be formally characterised and identified by formal verification techniques. [6]

Blandford has also developed Ontological Sketch Modelling (OSM) – a less formal but practical approach to interactive system modelling which concentrates on the entities involved in interactions rather than the more 'traditional' approach of modelling the tasks that can be undertaken by or with those entities.

Cairns, Thimbleby and Jones used Markov modelling to analyse the complexity and user costs (and by implication the usability) of various personal technologies.

Personal Technologies

The IDC has further specialised in the analysis and design of personal technologies, in particular looking at the usability issues and problems introduced by portable, hand-held devices that, for example, have limited screen sizes.

Jones and Thimbleby investigated small scale devices, and Thimbleby [9] and various collaborators have investigated (or will be investigating) user interaction with embedded gadgets, web design, user manuals and interactive TV.

Thomas leads two EPSRC Networks, on Personal Technologies and Interactive TV, that encourages interaction and information exchange between practitioners and academics.

DISSEMINATION

The IDC has published widely, not only in the 'traditional' academic ways of peer reviewed journals and conferences, but also through broadcast media.

The IDC hosts an comprehensive web site and we will shortly develop our own digital library system to catalogue and deliver our publications (our digital library about digital libraries!)

Many IDC academics are also heavily involved in teaching and supervising undergraduate and postgraduate courses focussing on HCI and usability issues.

For more information see the web site at http://www.cs.mdx.ac.uk/research/idc/ or contact the IDC convenor Paul Curzon (p.curzon@mdx.ac.uk).

REFERENCES

1. Adams, A. & Blandford, A. (2001) Social issues can impede the provision of even innocuous medical information. Proc. Workshop on Dependability in Healthcare Informatics, Edinburgh, March 2001.

2. Blandford, A. E., Butterworth, R. & Curzon, P. (in press) PUMA Footprints: linking theory and craft skill in usability evaluation. To appear in Proc. Interact 2001.

3. Blandford, A. E. & Green, T. R. G. (in press) Group and individual time management tools: what you get is not what you need. To appear in *Personal and Ubiquitous Computing*.

4. Blandford, A., Stelmaszewska, H. & Bryan-Kinns, N. (in press) Use of multiple digital libraries: a case study. To appear in Proc. JCDL 2001.

5. Butterworth, R., Blandford, A. & Duke, D. (2000) Demonstrating the cognitive plausibility of interactive system specifications. *Formal Aspects of Computing* 12. pp. 237-259..

6. Curzon, P. & Blandford, A. E. (2001) Detecting multiple classes of user error. In Proc. EHCI'2001 (LNCS).

7. Fields, R., Paterno, F., Santoro, C. & Tahmassebi, C. (1999) *Comparing design options for allocating communication media in coopertative saftety critical contexts : a method and a case-study*. ACM TOCHI 6(4) pp370 – 398.

8. Theng, Y.L., Mohd Nasir, N., Buchanan, G., Bainbridge, D., Thimbleby, H. and Jones, M. (2000), *Children as Design Partners and Testers for a Children's Digital Library*, Lecture Notes in Computer Science: Research and Advanced Technology for Digital Libraries, Fourth European Conference ECDL'00, Borbinha, J. and Baker, T. (Eds.), pp. 249 - 258, Springer.

9. Thimbleby, H. (2000) *Calculators are needlessly bad.* International Journal of Human-Computer Studies. 52 pp1031 – 1069.