The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications

Chapter · September 2002

CITATIONS
782

READS
6,519

2 authors, including:

Julie A. Jacko
University of Minnesota Twin Cities
100 PUBLICATIONS **3,599** CITATIONS

SEE PROFILE

Book Review

The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies and Emerging Applications

Edited by Julie A. Jacko and Andrew Sears
Published by Lawrence Erlbaum Associates, London, 2003, ISBN 0-8058-3838-4, $95, 1277 pp

Reviewed by David Booth
DWP Psychology Division, Porterbrook House, 7 Pear Street, Sheffield, S11 8JF

The cost of this massive book may seem prohibitive but at the current exchange rate it amounts to a little over £52. Still rather a lot, you may think, for a personal purchase but libraries can order it for you and for anyone who is interested or working in the field of Human Computer Interaction (HCI), and once you flip the bonnet you can really see where the money goes. The potential resource that this book offers just goes on and on. Not only do you get 65 papers from some of the key authors in the field but some of these papers can also be used as working resources in their own right for developing tools. There is even a website (www.isrc.umbc.edu/hcihandbook) that is a stripped down version of the book, probably to aid sales, but the graphics and models used in the book are available in a larger printable format making them ideal for overheads and teaching aids, etc.

I must admit that I have not read everything in the handbook; I've got a life you know. I have read about a quarter of it in detail and skipped through the rest so I apologise for my wimpishness but hope that the things that I have read give you an indication of the undoubted quality and usefulness of this publication.

I would, first of all, like to take issue with the title. A handbook is supposed to be a concise manual or reference book providing specific information or instruction that can be carried in the hand. I could just about carry it in both hands so I suppose it just about makes the grade…but concise! This means to express much, clearly and in few words. I rest my case (try reading it in the bath).

Human-Computer Interaction, sometimes known as Computer-Human Interaction, is the study of how we interact with computers in an effort to understand the reasoning behind good and bad user experiences so that recommendations can be made for enhancing that experience in terms of efficiency and effectiveness of use and user satisfaction.

This book is based on the premise that in spite of how far we've come in terms of HCI, we still have far to go and many inane situations to overcome. A comical quote from the book that exemplifies this is 'If [un-named automobile company] had developed technology like [un-named software vendor], we would all be driving cars with the following characteristics:

1. Occasionally, your car would die on the freeway unexpectedly, and you would just accept this, restart and drive on.
2. The oil, water temperature and alternator warning lights would be replaced by a single "general car fault" warning light.
3. Occasionally, your car would lock you out and refuse to let you in until you simultaneously lifted the door handle, turned the key and grabbed hold of the radio antenna.
4. Every time they introduced a new model, car buyers would have to learn to drive all over again because none of the controls would operate in the same manner as the old car…'

No prizes for guessing who the manufacturers are, but this bit of fantasy makes a point that workers in the field of HCI know only too well, i.e. that the only thing that makes a software developer's job a nightmare is the damn user and when a system goes wrong it's because the user is an idiot! Our job, then, is to ensure that the user gets a fair

hearing and it's the job of this book to provide the HCI professional with the tools they need to do just that.

The Handbook has very helpful and readable section introductions. The major sections are:

I The History of HCI
II Humans in HCI
III Computers in HCI
IV Human Computer Interaction (including papers that look generally at HCI issues such as interface design, and specific issues like those around wearable computers and the web)
V Application Domains (looking at particular areas of computer function, e.g. telecommunications and health)
VI The Development Process
VII Managing HCI and Emerging Issues
VIII Perspective on HCI (the conclusion and future directions)

The sections, particularly at the beginning, don't really serve much of a purpose except to break up the large number of papers – useful in itself I suppose but they ought not to give the reader the idea that HCI can easily be broken up into 'the human', 'the computer' and 'the interaction'.

The most obviously useful sections for those working in the field of disability are Sections B and C of Part IV, i.e. 'Interaction for Diverse Users' and 'Interaction Issues for Special Applications'. 'Interaction for Diverse Users' deals with disability issues, cognitive impairments and designing systems for older users, which has much that can easily transfer to the field of disability because of cognitive issues and elements like familiarity and learning styles. These issues are themselves some of the features of the digital divide that separates the computer-enfranchised from the disenfranchised and as such ought to be of interest to anyone concerned about the power of ICT to either empower or isolate vulnerable groups like those comprising people with a disability. 'Interaction Issues for Special Applications' is also useful within the disability sphere as it contains papers on the social issues around computing, computer-based teaching, speech interfaces and the web. A number of other sections are, however, extremely useful for those working in HCI generally, especially Part 5 'The Development Process'. This covers some useful techniques that ought to form part of the skilled HCI worker's toolkit, e.g. requirement specification, task analysis, context-of-use, style guides, prototyping and scenario building.

Some sections contain heavily detailed elements of cognitive psychology but these are worth sweating over because (a) it's good for revising long forgotten experiments in cognitive psychology and (b) the implications for workstation design are significant, e.g. the discovery that the mouse was better than other input devices because of the faster pointer-positioning time. Because of the heavy cognitive basis, the intricate detail of some of the articles and the assumption of prior knowledge, the book is not for newcomers or the casual reader. A regular undergraduate cognitive textbook or introduction to HCI would be a good place to start because some of the concepts would be described at a higher level. It will, however, probably become an occasionally used but much loved resource for workers in the field although a persistent, interested reader would also get much out of the experience. Even for HCI workers, however, the handbook gets rather heavy, the first piece of portable data, i.e. that can be directly applied to projects, appears on page 61. This is about understanding users' mental models and at this point the publication begins to feel like a real handbook. The writing style, particularly in the early parts of the book, is occasionally impenetrable, because of repetitious, unclear use of words and the sudden introduction of jargon that is not previously defined. To balance this is the sheer scope of the book and its potential usefulness along with the emphasis, in later parts, on practical tools and some fascinating articles like the one on emotion and its impact on users' evaluations of an interface.

There are some notable contributors to the handbook. Jakob Nielsen is on the advisory board and Alan Newell contributes a paper. Newell used to work with Herbert and Simon on human-like computer decision-making models but he now works on computer interaction and elder users. S.K. Card both contributes a paper and is on the advisory board. Card was co-developer of GOMS technology (Goals, Operators, Methods, and Selection Rules), a major step forward in the fine-grain analysis of operator actions. As a result of the seminal work (Card et al., 1980) and the excellent *The Psychology of Human-Computer Interaction*

(Card et al., 1983) Card, colleagues and GOMS devotees were able to show, using GOMS, that new interfaces were not necessarily the cost-saving devices that companies thought they were.

Unfortunately, there are also some notable absences. Jakob Nielsen himself doesn't contribute a paper. I think this is a shame because although he isn't everyone's favourite usability guru, he is at the forefront of establishing the emerging principles around website usability. Additionally, he has been accused of not contributing enough academic-standard commentary; this would have been an easy hit for him and, therefore, a lost opportunity for us. Additionally, his partner Donald Norman doesn't contribute in any capacity. Norman is one of the most readable and humane writers in the field and particularly with his recent quest to remind usability specialists that the aesthetic quality of things is important in their usability, a necessary foil for the over technical, it is a shame that he doesn't contribute. For a good read try his *The Design of Everyday Things*. Norman is an avid collector of unusual teapots, which explains the design of the front cover (if you're curious, get – and read – the book).

Notable absences from the content of the book are, to any great extent, the GOMS methodology: I would have appreciated a 'how to…' section on this detailed area. There is no lack of individual papers that try to do this and so this sort of thing ought to be in a publication calling itself a handbook for the profession. Although web standards are still emerging, the Word Wide Web Consortium (W3C) is acknowledged by most in the field as being the authority to turn to for definitive answers in accessibility for people with a disability. W3C is mentioned only once in a single paragraph.
In summary, I would recommend the purchase of the Handbook for anyone working in the field of HCI. It is of less value, but still a good resource, for those interested in the use of ICT by people with a disability, particularly cognitive impairments.

REFERENCES

Card, S. K. et al. (1980). Computer text-editing: An information-processing analysis of a routine cognitive skill, *Cognitive Psychology*, 12, 32-74.

Card, S. K. et al. (1983). *The Psychology of Human-Computer Interaction*, Lawrence Hillsdale: Erlbaum Associates, Inc.

Norman, D. A. (1998) *The Design of Everyday Things*, Massachusetts, The MIT Press.