SIGCHI Social Impact Award Talk – Ability-Based Design: Elevating Ability over Disability in Accessible Computing

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Abstract
The term "disability" connotes an absence of ability, but is like saying "dis-weight" or "dis-height." All living people have some abilities [2]. Unfortunately, history is filled with examples of a focus on *dis*-ability, on what is missing, and on ensuing attempts to replace lost function to make people match a rigid world. Although often well intended, such a focus assumes humans must be adapted, and that interfaces, devices, and environments get to remain as they are. At the same time, our built things embody numerous "ability assumptions" imparted by their designers, and yet our built things remain unaware of their users' abilities. They also remain unaware of the situations their users are in, or how those situations affect their users' abilities [2,3]. An important shift in perspective comes by allowing people to "remain as they are," asking instead how interfaces, devices, and environments can bear the burden of becoming more suitable to their users' situated abilities. I call this perspective and the principles that accompany it "Ability-Based Design" [4,5], where the human abilities required to use a technology in a given context are questioned, and systems are made operable by or adaptable to alternative abilities. From this perspective, all people have varying degrees of ability, and different situations lead to different ability limitations, some long-term and some momentary. Some ability limitations come mostly

from within the self, others from mostly outside the self. Ability-Based Design considers this whole "landscape of ability," respecting the human at its center and asking more of our technologies. In this talk, I will cover a decade's worth of projects related to Ability-Based Design, some directed at "people with disabilities" and others directed at "people in disabling situations." Rather than dive into any one project, I will convey a space of explored possibilities. I will also put forth a grand challenge: that anyone, anywhere, at any time can interact with technologies ideally suited to their specific situated abilities, and that our technologies do the work to achieve this fit.

Author Keywords

Ability, disability, assistive technology, accessible computing, adaptivity, adaptability, configurability, human performance, situation, context, environment, situationally-induced impairments and disabilities.

ACM Classification Keywords

K.4.2. Computers and society: Social issues – *assistive technologies for persons with disabilities*.

Speaker's Bio

Jacob O. Wobbrock is an Associate Professor in the Information School and an Adjunct Associate Professor in the Department of Computer Science & Engineering at the University of Washington, where he directs the Mobile & Accessible Design Lab.[1] He is a founding member of the design: use: build: Group (DUB Group)[2] and the multi-departmental Master of HCI & Design[3] program at UW. Dr. Wobbrock's research seeks to scientifically understand people's interactions with computers and information, and to improve those interactions through design and engineering, especially for people with disabilities. His specific research topics include interaction techniques, human performance measurement and modeling, HCI research and design methods, mobile computing, and accessible computing. He pursues Ability-Based Design [4,5], where the human abilities required to use a technology in a given context are questioned, and systems are made operable by or adaptable to alternative abilities. For example, his Slide Rule project [1] (with Shaun Kane and Jeffrey Bigham) was the first to make touch screen smartphones accessible to blind people using gestures, influencing Apple's VoiceOver design for iOS.[4] Dr. Wobbrock has co-authored over 120 peer-reviewed publications, receiving 19 paper awards, including 7 best papers and 7 honorable mentions from ACM CHI. He is the recipient of an NSF CAREER award and five other National Science Foundation grants. He is on the editorial board of ACM Transactions on Computer-Human Interaction. His advisees, to whom he owes his success, have become professors at Harvard, Cornell, Colorado, Maryland, Brown, Simon Fraser, and elsewhere. Dr. Wobbrock received his B.S. in Symbolic Systems and his M.S. in Computer Science from Stanford University; he received his Ph.D. in Human-Computer Interaction from Carnegie Mellon University. Upon graduation, he was honored with CMU's School of Computer Science Distinguished Dissertation Award.

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1 http://depts.washington.edu/madlab/
2 http://dub.washington.edu/
3 http://mhcid.washington.edu/
4 http://www.apple.com/accessibility/iphone/vision/

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References

1. Kane, S.K., Bigham, J.P. and Wobbrock, J.O. (2008). Slide Rule: Making mobile touch screens accessible to blind people using multi-touch interaction techniques. *Proceedings of the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '08).* Halifax, Nova Scotia (October 13-15, 2008). New York: ACM Press, pp. 73-80. http://dl.acm.org/citation.cfm?id=1414487
2. Newell, A.F. (1995). Extra-ordinary human-computer interaction. Chapter 1 in *Extra-Ordinary Human-Computer Interaction: Interfaces for Users with Disabilities*, Alistair D. N. Edwards (ed.). Cambridge, England: Cambridge University Press, pp. 3-18. http://dl.acm.org/citation.cfm?id=215600
3. Sears, A. and Young, M. (2003). Physical disabilities and computing technologies: An analysis of impairments. Chapter 25 in *The Human-Computer Interaction Handbook* (1st ed.), Julie A. Jacko and A. Sears (eds.). Hillsdale, NJ: Lawrence Erlbaum Associates, pp. 482-503. http://dl.acm.org/citation.cfm?id=772105
4. Wobbrock, J.O. (2014). Improving pointing in graphical user interfaces for people with motor impairments through ability-based design. Chapter 8 in G. Kouroupetroglou (ed.), *Assistive Technologies and Computer Access for Motor Disabilities*. Hershey, PA: IGI Global, pp. 206-253. http://www.igi-global.com/chapter/improving-pointing-graphical-user-interfaces/78429
5. Wobbrock, J.O., Kane, S.K., Gajos, K.Z., Harada, S. and Froehlich, J. (2011). Ability-Based Design: Concept, principles and examples. *ACM Transactions on Accessible Computing 3* (3), April 2011. Article No. 9. http://dl.acm.org/citation.cfm?id=1952384