

Amy Hurst

Assistant Professor, Information Systems Department, UMBC

amyhurst@umbc.edu <http://www.amyhurst.com>

Research Interests

I develop technology that is rooted in real world problems and is constrained by pre-existing human behaviors. My work has spanned many domains including assistive technology (C13-C20), design (C8-C12, J2), and mobile computing (C1-C7, J3). I have worked extensively with a variety of populations including individuals with severe cognitive or motor impairments, elders, and novice technology users. My passion for research comes from a desire to find how technology can make a positive impact on current social problems. This has led me to work on problems encountered by individuals with disabilities who have limited access to the opportunities provided by computers, and elders who have to move out of their homes and into assisted living facilities. I am now exploring how rapid prototyping tools can be leveraged to enable people to build their own assistive technology, research that is inspired by the current Do It Yourself (DIY) movement.

Education

Carnegie Mellon University. PhD in Human-Computer Interaction (2003 – 2010)

Carnegie Mellon University. Masters in Human-Computer Interaction (2007)

Georgia Institute of Technology. Bachelors of Science in Computer Science (2003)

Georgia Institute of Technology. Certificate in Film Studies (2003)

Awards

Richard King Mellon Presidential Fellowship in the Life Sciences (2009)

Google Anita Borg Scholarship (2008)

National Science Foundation Graduate Research Fellowship (2005)

Employment

Assistant Professor, Information Systems Department: Human-Centered Computing, UMBC, Baltimore MD (2010 – Present)

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Research Assistant, Carnegie Mellon, Pittsburgh, PA (2005 – 2010)

Built tools and developed techniques to automatically detect user computer pointing behavior. Focused research on several contexts for detecting user needs, including motor impaired PC users, situationally impaired mobile PDA users, and novice users of a specific application. [C13-C18, W2]

Supervisors: Jennifer Mankoff and Scott E. Hudson

Research Assistant, Carnegie Mellon, Pittsburgh, PA (2003-2005)

Designed and built fabric sensors to help enable elders to live at home longer. These sensors were built cover the whole chair, or just an arm rest cover to turn an elder's favorite lounge chair into a ubiquitous computing sensing device. [J2, C9-C12, W1]

Supervisors: Chris Atkeson and John Zimmerman

Summer Intern, PARC, Palo Alto, CA (1999, 2000, 2001, 2003)

2003: Designed and Prototyped techniques to display large images on small displays.
Supervisor: Ruth Rosenholtz

2000 & 2001: Worked on the Sotto Voce Project to design and create several iterations of an electronic guidebook on a PDA to facilitate interaction between guests in historic houses and to provide on-demand information. [J3, C1- C7, P1]

Supervisors: Paul Aoki, Allison Woodruff

1999: BibTeX Duplicated and organized publications for a publications database.
Supervisors: Stu Card, Allison Woodruff

Research Assistant, Georgia Institute of Technology, Atlanta, GA with Dr. Tucker Balch (2002-2003)

Wrote program to perform color tracking of marked bees from video of a beehive and created user interface for biologists to watch tracked bees in video recordings.

Research Assistant, Georgia Institute of Technology, Atlanta, GA, with Dr. Thad Starner (2000-2003)

Collaborated with physicians and computer scientists to design and develop system to measure the manual dexterity of Parkinson's patients using a pressure sensitive tablet display. Evaluated system at Emory University Brain Clinic with individuals with Parkinson's Disease.

Built 3D animations that were used in an interactive pool game driven by the perspective workbench. [J1]

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Publications

Journal Articles

- [J.3] M. H. Szymanski, P.M. Aoki, R.E. Grinter, A. Hurst, J.D. Thornton, and A. Woodruff, Sotto Voce: Facilitating Social Learning in a Historic House. *Computer Supported Cooperative Work* 17 (1), 2008, 5-34.
- [J.2] J. Zimmerman, A. Hurst, and M. M. R. Peeters, Fabric-circle-slider: Prototype Exploring the Interaction Aesthetic of Contextual Integration. *Journal of Knowledge, Technology, and Policy*, 20 (1), 2007, 51-57.
- [J.1] T. Starner, B. Leibe, D. Minnen, T. Westyn, A. Hurst, and J. Weeks, Computer Vision-Based Gesture Tracking, Object Tracking, and 3D Reconstruction for Augmented Desks. *Machine Vision and Applications*, 14 (1), 2003, 59-71.

Peer Reviewed Conference Papers

- [C.20] C. Brown and A. Hurst. VizTouch: Automatically Generated Tactile Visualizations of Corrdinate Spaces. In *ACM Tangible Embedded and Embodded Interaction (TEI' 2012)*, to appear.
- [C.19] A. Hurst and J. Tobias. Empowering individuals with do-it-yourself assistive technology. In *ACM SIGACCESS conference on Computers and accessibility (ASSETS '11)*. 2011, 11-18.
- [C.18] A. Hurst, S. E. Hudson, and J. Mankoff, Automatically Identifying Targets Users Interact With During Real World Tasks. In *Intelligent User Interfaces (IUI)*, 2010, 11-20.
- [C.17] A. Hurst, J. Mankoff, and S.E. Hudson, Understanding Pointing Problems in Real World Computing Environments. In *ACM SIGCHI Conference on Computers and Accessibility (ASSETS)*, 2008, 43-50.
- [C.16] A. Hurst, S. E. Hudson, J. Mankoff, and S. Trewin, Automatically Detecting Pointing Performance. In *Intelligent User Interfaces (IUI)*, 2008, 11-19.
- [C.15] A. Hurst, J. Mankoff, A. Dey, and S. E. Hudson, Dirty Desktops: Using a Patina of Magnetic Mouse Dust to Make Common Interactor Targets Easier to Select. In *ACM Symposium on User Interface Software and Technology (UIST)*, 2007, 183-186.
- [C.14] A. Hurst, S.E. Hudson, and J. Mankoff, Dynamic Detection of Novice vs. Skilled Use Without a Task Model. In *ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)*, 2007, 271-280.

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- [C.13] S. Carter, A. Hurst, J. Mankoff, and J. Li, Dynamically Adapting GUIs to Diverse Input Devices. In ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2006, 63-70.
- [C.12] A. Hurst, J. Zimmerman, and M. Peeters, Fabric-circle-slider: Prototype Exploring the Interaction Aesthetic of Contextual Integration. In Designing Pleasurable Products and Interfaces (DPPI), 2005, 272-282.
- [C.11] J. Forlizzi, C. DiSalvo, J. Zimmerman, B. Mutlu, and A. Hurst, 2005. The SenseChair: the Lounge Chair as an Intelligent Assistive Device for Elders. In Conference on Designing For User Experience (DuX), 2005, 135: 31.
- [C.10] N. Jafarainami, J. Forlizzi, A. Hurst, and J. Zimmerman, Breakaway: an Ambient Display Designed to Change Human Behavior. In ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), 2005, 1945 - 1948.
- [C.9] A. Hurst, J. Zimmerman, C. Atkeson, and J. Forlizzi, The Sense Lounger: Establishing a Ubicomp Beachhead in Elders' Homes. In ACM SIGCHI Conference on Human factors in Computing Systems (CHI), 2005, 1467 - 1470.
- [C.8] D. Holstius, J. Kembel, A. Hurst, P. Wan, and J. Forlizzi, Infotropism: Living and Robotic Plants as Interactive Displays. In ACM Conference on Designing Interactive Systems: processes, practices, methods, and techniques (DIS), 2004, 215 - 221.
- [C.7] A. Woodruff, P.M. Aoki, R.E. Grinter, A. Hurst, M.H. Szymanski, and J.D. Thornton, Eavesdropping on Electronic Guidebooks: Observing Learning Resources in Shared Listening Environments. In Museums and the Web (MW), 2002, 21-30.
- [C.6] P.M. Aoki, R.E. Grinter, A. Hurst, M.H. Szymanski, J.D. Thornton, and A. Woodruff, Sotto Voce: Exploring the Interplay of Conversation and Mobile Audio Spaces. In ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), 2002, 431-438.
- [C.5] R.E. Grinter, P.M. Aoki, A. Hurst, M.H. Szymanski, J.D. Thornton, and A. Woodruff, Revisiting the Visit: Understanding How Technology Can Shape the Museum Visit. In ACM Conference on Computer Supported Cooperative Work (CSCW), 2002, 146-155.
- [C.4] A. Woodruff, P.M. Aoki, A. Hurst, and M.H. Szymanski, Electronic Guidebooks and Visitor Attention. In Cultural Heritage Informatics Meeting (ICHIM), 2001, 437-454.

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- [C.3] A. Woodruff, M.H. Szymanski, P.M. Aoki, and A. Hurst, The Conversational Role of Electronic Guidebooks. In ACM Conference on Ubiquitous Computing (UbiComp), 2001, 187-208.
- [C.2] A. Woodruff, P.M. Aoki, A. Hurst, and M.H. Szymanski, The Guidebook, the Friend, and the Room: Visitor Experience in a Historic House. In ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), 2001, 273-274.
- [C.1] P.M. Aoki, A. Hurst, and A. Woodruff, Tap Tips: Lightweight Discovery of Touchscreen Targets. In ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), 2001, 237-238.

Workshop and Other Publications

- [W.3] A. Hurst, K. Gajos, L. Findlater, J. Wobbrock, A. Sears, and S. Trewin, Workshop 24: Dynamic Accessibility: Detecting and Accommodating Differences in Ability and Situation, at ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), 2011.
- [W.2] A. Hurst, Automatic Assessment and Adaptation to Real World Pointing Performance. In ACM SIGACCESS Accessibility and Computing, 93, (2009), 4-10.
- [W.1] A. Hurst and J. Zimmerman, Evaluating a Fabric Device Controller, Workshop 14: Innovative Approaches to Evaluating Affective Interfaces at ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), 2005.

Artifacts and Patents

- [P.1] P.M. Aoki, R.R. Burton, A. Hurst, and A. Woodruff, "Feedback Mechanism for Use with Visual Selection Mechanisms," U.S. Patent Application Ser. 09/906,667, July 2001.

Doctoral Consortium Participant

- [D.3] ACM Symposium on User Interface Software and Technology (UIST), 2008.
- [D.2] ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2008.
- [D.1] International Symposium on Wearable Computers (ISWC), 2008.

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Funding and Grants

- [F.1] “Review and Analysis of VVSG for Manual Dexterity Disabled Peoples” from NIST, September 2010.

Awards and Invited Talks

- [A.2] Nickel for Scale at Botacon: Robots for a Better Future, December 2010.
- [A.1] Nickel For Scale (<http://nickelforscale.com/>) project won “Audience Choice” at the 2010 Baltimore Hackathon.