

Thad Starner

Associate Professor
School of Interactive Computing, College of Computing
Georgia Institute of Technology
Atlanta, GA 30332-0280, USA

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EDUCATIONAL BACKGROUND

Degree	Year	University	Field
Ph.D.	1999	Massachusetts Institute of Technology, Cambridge, MA., USA.	<i>Media Arts & Sciences</i>
S.M.	1995	Massachusetts Institute of Technology, Cambridge, MA., USA.	<i>Media Arts & Sciences</i>
B.S.	1991	Massachusetts Institute of Technology, Cambridge, MA., USA.	<i>Computer Science</i>
B.S.	1991	Massachusetts Institute of Technology, Cambridge, MA., USA.	<i>Brain and Cognitive Science</i>

EMPLOYMENT HISTORY

Title	Organization	Years
Associate Professor	College of Computing Georgia Institute of Technology, Atlanta, GA., USA	<i>2006-present</i>
Visiting Professor	Electrical and Computer Engineering, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland	<i>2002</i>
Assistant Professor	College of Computing Georgia Institute of Technology, Atlanta, GA., USA	<i>1999-2006</i>
Research Assistant	Media Laboratory, Perceptual Computing Section, Massachusetts Institute of Technology, Cambridge, MA., USA.	<i>1993-1999</i>
Associate Scientist	Media Laboratory, Speech Systems Group, BBN Cambridge, MA., USA	<i>1992-1993</i>
Research Assistant	Media Laboratory, Perceptual Computing Section, Massachusetts Institute of Technology, Cambridge, MA., USA.	<i>1991-1992</i>
Undergraduate Research Assistant	Media Laboratory, Perceptual Computing Section, Massachusetts Institute of Technology, Cambridge, MA., USA.	<i>1989-1991</i>
Research Programmer	Design Plus, Inc., York, PA., USA	<i>Summer 1987, 1988</i>

CURRENT FIELDS OF INTEREST

My research interests include Wearable and Ubiquitous Computing, Human-Computer Interaction, Computational Perception, Pattern Recognition and Discovery, and Artificial Intelligence. My research focuses on creating computational interfaces and agents for use in everyday mobile environments. In

particular, I am interested in developing techniques for supporting users while they are engaged in face-to-face conversation. In the work environment, I investigate fast-to-access systems for capturing and recalling serendipitous information the user may obtain while away from the desk, such as phone numbers, appointments, and meeting and lecture notes. I am also developing a phrase-level American Sign Language to English translation system for assisting deaf users when interacting with the hearing community for tasks where an interpreter is not feasible (automobile accidents, travel, apartment hunting, etc.). Utilizing on-body sensing and context awareness, I am exploring methods of supporting the user's memory during everyday activities. My work aims at making state-of-the-art contributions in wearable computing and human computer interaction (HCI), relying on pattern recognition techniques and mobile interface design for development and user studies for evaluation.

I. TEACHING

A. Courses Taught

Quarter/Year	Course Number & Title	Number of Students	Comments
College of Computing, Georgia Institute of Technology			
Winter 1999	CS 4495/7321 Low Level Computer Vision	10	
Spring 1999	CS 4803/8113 Mobile and Ubiquitous Computing (with Gregory Abowd)	32	New
Fall 1999	CS 4495/7495 Computer Vision	24	
Spring 2000	CS 7470 Mobile and Ubiquitous Computing (with Elizabeth Mynatt)	33	
Fall 2000	CS 4495/7495 Computer Vision (with Aaron Bobick)	24	
Spring 2001	CS 7470 Mobile and Ubiquitous Computing	17	
Fall 2001	CS 4600 Introduction to Intelligent Systems	26	
Spring 2002	CS 4600 Introduction to Intelligent Systems	43	
Spring 2003	CS 4600 Introduction to Intelligent Systems	49	
Spring 2003	CS 4803H/8803D Wearable Computing	16	New
Spring 2004	CS 4600 Introduction to Intelligent Systems	53	
Fall 2004	CS 3600 Introduction to Intelligent Systems	50	
Fall 2004	CS 7470 Ubiquitous Computing	23	
Fall 2005	CS 3600 Introduction to Intelligent Systems	60	
Spring 2006	CS 3600 Introduction to Intelligent Systems	60	
Seminars			
Fall 2000	CS 4801 Building Mobile and Ubiquitous Computers (with Cory Kidd)	10	Seminar
Fall 2003	CS 1801 Freshman Seminar	20	Seminar

B. Curriculum Development

CS 7470: Mobile and Ubiquitous Computing (1999-present): New graduate and undergraduate course introduced by Gregory Abowd and Thad Starner. Provides an introduction to the fundamental challenges of ubiquitous computing. Encourages students to examine every aspect of the field and

research two topics deeply. In Spring 2001, a more intimate version of the course encouraged one on one interaction, urged deep research, and rewarded creativity and inventiveness. In Fall 2004, student projects resulted in ten paper submissions to various conferences, with seven acceptances.

CS 4803H/8803D Wearable Computing (2003-present): Developed a new graduate and undergraduate course that challenges students to examine wearable computing from every aspect: physics, systems, psychophysics, networking, HCI, and social issues. Student projects examined the current literature and developed research methodologies to extend knowledge in the field. One such project led to a highly reviewed paper in CHI2004. Will be merged with CS7470 to create a new course for undergraduate curriculum Fall 2006.

CS 3600/4600 Introduction to Intelligent Systems (2001-present) . CS3600 is the introductory AI course at Georgia Tech. The course now requires programming in Lisp and aims to attract juniors and ambitious sophomores to encourage future enrollment in the more advanced IS classes. The Spring 2002 enrollment began to reflect this effort. Presentation of course material encourages continued exploration through UROCs by pairing the book chapters with the research interests of current Georgia Tech faculty. In 2003, redesigned the course to include more numerical methods, reflecting an update in the new edition of the Russell and Norvig text. Course project in game playing (Isolation) has been adopted by Vanderbilt.

CS 4495/7495 Computer Vision (1999-2000): Computer Vision was re-developed for semesters integrating the content from the previous Low and High Level Computer Vision courses. The first semester emphasized fundamentals followed by higher level techniques as developed in the current literature. The second semester, co-taught with Aaron Bobick, concentrated on image processing. Students were encouraged, with good success, to develop class projects that could be submitted to full conferences.

CS 1801 Freshman Seminar (2003-present): A joint effort of a team of faculty led by Merrick Furst, the freshman seminar aims to improve retention of incoming computer science students by exposure to interesting research and by demonstrating the application of their classes to real-world problems. The class alternates between large lectures with the college's freshman class and 20 person interactive sessions based on current events in computer science.

CS 4801 Building Mobile and Ubiquitous Computers (2000): This class emphasized hands-on experience and was developed for early undergraduates and graduates (not registered) who desire to develop their skill sets. The class emphasized individual and team project work. Graduate students are urged to learn management skills for teams of undergraduates. The lectures introduce the students to various research groups and resources on campus. In 2000, the class projects were demonstrated to over 500 people.

C. Individual Student Guidance

Post-Doctoral Fellows

Kwang-Hyun "Joseph" Park CoC

Spring 2004 - Spring 2005.

Publications: *D.3.4.*

Research on gestural communication.

Research scientist at KIST (research laboratory), Korea

Kent Lyons CoC

Fall 2005-present.

Publications: *D.2.23, E.3.2, D.2.27, D.2.33, D.2.41, D.2.46, D.2.49, D.2.39, D.2.50, D.2.52, D.2.58, D.2.60, D.3.1, D.2.56, B.13, E.3.15 .*

Research on interfaces for face to face conversation.

Ph.D. Students Supervised (in process as well as graduated)

Helene Brashear (CoC)

Spring 2001-present

Publications: *D.2.37, D.2.40, D.2.44, D.2.51, D.2.53, D.2.54 .*

Current research on sign language recognition.

David Minnen (CoC, with Professor Irfan Essa)

Fall 2001 - Present.

Publications: *D.2.28, B.10, 7, D.2.36, D.2.55 .*

Current research on human activity discovery. Awarded Georgia Tech Presidential Fellowship.

Awarded NSF Graduate Student Fellowship 2002 - 2005.

Tracy Westeyn (CoC)

Spring 2002-present.

Publications: *B.10, D.2.40, D.2.45, D.2.59, D.3.4 .*

Current research on activity discovery using wearable sensors.

Kent Lyons (CoC)

Spring 2002-Summer 2005.

Publications: *See above.*

Defended May 2005; thesis on mobile input.

Valerie Henderson (CoC)

Fall 2003-present.

Publications: *D.2.44, D.2.51, D.2.53, D.2.54 .*

Current research on interfaces for the deaf. Awarded Georgia Tech Presidential Fellowship.

Awarded NSF Graduate Student Fellowship 2004 - 2007.

Daniel Ashbrook (CoC)

Fall 2005-present.

Publications: *D.2.26, D.2.32, 6, D.2.35, B.11, D.2.49, D.2.48 .*

Activity discovery and prediction. Awarded Georgia Tech Presidential Fellowship.

SeungYon Lee (CoC)

Fall2005-present.

Publications: *D.2.51, D.2.53, D.2.54 .*

Current research investigates educational software for teaching sign to deaf children.

Ph.D. Students Thesis Committees.

Jennifer Ockerman, Department of ISYE, College of Engineering, Georgia Tech., July 2000.

Thesis Title: "Task Guidance Systems."

Principal Advisor: Dr. Amy Pritchett.

Darnell Moore, Department of ECE, College of Engineering, Georgia Tech., July 2000.

Thesis Title: "Vision-Based Recognition of Action Using Context."

Principal Advisor: Dr. Irfan Essa and Dr. Monson Hayes III

Zachary Wartell, College of Computing, Georgia Tech., July 2001.
Thesis Title: "Characterizing image fusion techniques in stereoscopic HTDs."
Principal Advisor: Dr. Larry Hodges

Rawesak Tanawongsuwan, College of Computing, Georgia Tech., December 2003.
Thesis Title: "Impact of speed variations in gait recognition."
Principal Advisor: Dr. Aaron Bobick

Rich DeVaul, MIT Media Laboratory., June 2004.
Thesis Title: "The Memory Glasses: Wearable Computing for Just-in-Time Memory support."
Principal Advisor: Dr. Alex Pentland

Kyeong Keol Ryu, Department of ECE, College of Engineering, Georgia Tech., June 2004.
Thesis Title: "Automated Bus Generation for Multi-Processor SOC Design."
Principal Advisor: Dr. Vincent J. Mooney III

David Krum, College of Computing, Georgia Tech., December 2004.
Thesis Title: "Wearable computers and spatial cognition."
Principal Advisor: Dr. William Ribarsky

Kent Lyons, College of Computing., August 2005.
Thesis Title: "Improving support of conversations by enhancing mobile computer input."
Principal Advisor: Dr. Thad Starner

Eric Martinson, College of Computing., Passed proposal May 2005.
Thesis Title: "Acoustical awareness for intelligent robotic control."
Principal Advisor: Dr. Ronald Arkin

Gillian Hayes, College of Computing., Passed proposal August 2005.
Thesis Title: "Documenting and Understanding Everyday Activities through the Selective Archiving of Live Experiences."
Principal Advisor: Dr. Gregory Abowd

Ph.D. Qualifying Exam Committees.

Rawesak Tanawongsuwan, College of Computing, Georgia Tech., Fall 2002.
Principal Advisor: Dr. Aaron Bobick.

Amin Atrash, College of Computing, Georgia Tech., Fall 2003.
Principal Advisor: Dr. Sven Koenig..

Yifan Shi, College of Computing, Georgia Tech., Summer 2003.
Principal Advisor: Dr. Aaron Bobick..

Adam Feldman, College of Computing, Georgia Tech., Fall 2004.
Principal Advisor: Dr. Tucker Balch..

Alan Wagner, College of Computing, Georgia Tech., Fall 2004.
Principal Advisor: Dr. Ron Arkin..

Xuehai Bian, College of Computing, Georgia Tech., Spring 2005.
Principal Advisor: Dr. Gregory Abowd..

Tazama St. Julien, College of Computing, Georgia Tech., Spring 2005.
Principal Advisor: Dr. Chris Shaw..

Ph.D. Special Problems students.

William Halliburton (CoC)

Fall 1999.

Wearable spectrometer development for skin lesion diagnosis.

Rawesak Tanawongsuwan (CoC)

Fall 1999.

Wearable Face Recognition.

Wasinee Rungsarityotin (CoC)

Fall 1999-Spring 2000.

Publications: *D.2.25.*

Finding location using omnidirectional video on a wearable computing platform.

Bradley Singletary (CoC)

Spring 1999 – Summer 2002.

Publications: *B.9, D.2.21, D.2.22, E.3.2, D.2.29, D.2.30*

Recognizing social situations using wearable sensing.

Member of Research Staff Applied Systems Intelligence, Inc.

Jake Auxier (CoC)

Spring 2000 - Fall 2000

Publications: *D.2.26, 6.*

Wearable gesture recognition in the Aware Home.

Ben Wong (CoC)

Spring 2000 – Spring 2003.

Publications: *D.2.31, D.2.42, D.2.49 .*

Conversational speech-based agents.

Amin Atrash (CoC)

Spring 2003.

Publications: *D.2.40, D.2.43 .*

Activity recognition using wearable sensors.

Member of Research Staff, BBN.

Arya Irani (CoC)

Fall 2003–Spring 2004

Mobile gesture interfaces.

Daniel Plaisted (CoC)

Fall 2003–Spring 2004

Publications: *D.2.41, D.2.46, .*

Mobile text entry.

Xuehai Bian (CoC)

Fall 2004

Publications: *D.2.59 .*

Hybrid on-body/environmental sensing for activity recognition.

M.S. Thesis Students supervised.

Christian Metzger (ETH-Zurich)

Spring 2004-Fall 2004

Publications: *D.2.47*

Graduated Fall 2004. Accepted to PhD program ETH-Zurich. Mobile interfaces to assist face-to-face conversation.

MS. Special Problems students.

Bastian Leibe (CoC)

Spring 1999-Fall 1999

Publications: B.9, D.2.21, D.2.22, D.3.1 E.3.2 D.2.28, B.10, 7

Best Paper Award IEEE VR2000. Received the ETH-Zurich Medal for his PhD dissertation on computer vision.

Kent Lyons (CoC)

Fall 1999-Spring 2001.

Publications: See above.

Completed MS Spring 2001. Graduated with Georgia Tech PhD 2005.

Rob Melby (CoC)

Fall 2000-Summer 2002.

Completed MS Summer 2002. Researcher at Atlanta Veteran's R&D Center. Research on mobile computer vision.

Tracy Westeyn (CoC)

Spring 2001-Spring 2002.

Publications: See above.

Transferred to CoC PhD program.

Daniel Ashbrook (CoC)

Fall 2002-present.

Publications: See above.

Completed MS Spring 2005. Activity discovery and prediction.

Cornelius (Niels) Snoeck (TU Delft)

Spring 2003-Fall 2003

Publications: D.2.42, D.2.49 .

Completed MS Fall 2003. Running start-up business. Mobile interfaces to assist face-to-face conversation.

Robert (Marty) McGuire (CoC)

Fall 2003

Publications: D.2.42, D.2.44, .

Research Scientist at CMU. Evaluation of mobile calendaring systems.

Chris Skeels (CoC)

Spring 2004-Spring 2005

Publications: D.2.49, D.2.58 .

Completed MS Spring 2005. Mobile interfaces to assist face-to-face conversation. Accepted to Georgia Tech PhD program.

SeungYon Lee (CoC)

Summer 2004-present.

Publications: See above.

Completed MS Spring 2005. Educational game development for ASL.

Stephen Griffin (LCC)

Summer 2004-Fall 2004.

Mobile keyboard design. Designer at Cartoon Network

Kristin Vadas (CoC)

Fall 2004-present

Publications: *D.2.59* .

Mobile display evaluation. Awarded Donald V. Jackson Fellowship.

James Clawson (CoC)

Spring 2005-Summer 2005

Publications: *D.2.50, D.2.60* .

Completed MS Summer 2005. Mobile text entry evaluation.

Peter Pesti (CoC)

Spring 2005-Summer 2005

Publications: *D.3.4* .

Completed MS Summer 2005. Eyeblink interfaces.

Nirmal Patel (CoC)

Fall 2005-present

Publications: *D.2.39* .

Dual Purpose Speech interfaces.

Undergraduate Research Students.

Kent Lyons (CoC)

Spring 1999-Fall 1999.

Publications: *See above.*

RF positioning system for the Aware Home. CoC PhD candidate

Rob Melby (CoC)

Spring 1999-Fall 2000.

Publications: *See above.*

Computer vision and wearable computing. CoC MS graduate.

Justin Weeks (CoC)

Spring 2000.

Publications: *B.9, B.10, D.2.28, 7*

Perceptive workbench.

Adam Wosotowsky (CoC)

Summer 2000-Fall 2000.

Classroom capture of lecturer's perspective

Daniel Ashbrook (CoC)

Spring 2000-Fall 2002.

Publications: *See above.*

Gesture-based control of in-home devices.

Awarded second place judge's UROC award 2000, second place people's choice UROC award 2000, Ford Motor Company Research Laboratory's Best Design Solution 2001. PhD student.

David Minnen (CoC)

Fall 2000-Spring 2001.

Publications: *See above.*

Gesture-based augmented reality. PhD candidate.

Awards: Third place judge's UROC award 2001.

Will Rachelson (CoC)

Fall 2000-Spring 2000.

USB development kit for interaction.

Developing prototype hardware for UC Berkeley for Antarctica exploration.

Amy Hurst (CoC)

Spring 2001-Spring 2003

Publications: B.10 .

Medical Monitoring Through Gesture

Awards: Third place judge's UROC award 2002.

CMU PhD student.

James Fusia III (CoC)

Spring 2001-present

Publications: D.2.41 .

Apparatus for mobile gesture tracking and wearable computing

Robert McGuire (CoC)

Spring 2001-Spring 2003

Publications: See above.

Wearable computer user interfaces.

Research scientist at CMU.

Nirmal Patel (CoC)

Fall 2002-present

Publications: See above.

Mobile input. Georgia Tech Masters student.

Jiasheng He (CoC)

Fall 2004-present

Wireless sensor development.

About 40 undergraduate students total from 1991 to present (26 Georgia Tech and 15 MIT, total). Over 50% pursue an advanced degree.

II. RESEARCH AND CREATIVE SCHOLARSHIP

A. Thesis

S.M. Thesis

Title: “*Visual Recognition of American Sign Language Using Hidden Markov Models.*”
Date Completed: *February 1995,*
Advisors: *Dr. Alex Pentland,*
University: *Massachusetts Institute of Technology.*

Ph.D. Thesis

Title: “*Wearable Computing and Contextual Awareness.*”
Date Completed: *June 1999,*
Advisor: *Dr. Alex Pentland,*
University: *Massachusetts Institute of Technology.*

B. Published Journal Papers (refereed)

- B.1 Friedmann M., T. Starner, and A. Pentland. “Synchronization in Virtual Realities.” In *Presence*, Volume 1 (1), pp. 139–144, MIT Press, Spring 1991.
- B.2 Azarbayejani, A., T. Starner, B. Horowitz, and A. Pentland. “Visually Controlled Graphics.” In *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Volume 15 (6), pp. 602–605, IEEE Computer Society Press, June 1993.
- B.3 Starner, T., “Human Powered Wearable Computing”, In *IBM Systems Journal*, Volume 35 (3), pp. 618–629, 1996.
- B.4 Wren, C., F. Sparacino, A. Azarbayejani, T. Darrell, T. Starner, A. Kotani, C. Chao, M. Hlavac, K. Russell, and A. Pentland, “Perceptive Spaces for Performance and Entertainment: Untethered Interaction Using Computer Vision and Audition”, In *Applied Artificial Intelligence Journal*, Volume 11 (4), pp. 267–284, June 1997.
- B.5 Starner, T., S. Mann, B. Rhodes, J. Levine, J. Healey, D. Kirsch, R. Picard, and A. Pentland, “Augmented Reality Through Wearable Computing”, In *Presence*, Volume 6 (4), pp. 386-398, Winter 1997.
- B.6 Starner, T., J. Weaver, and A. Pentland, “A Wearable Computing Based American Sign Language Recognizer”, In *Personal and Ubiquitous Computing*, Volume 1 (4), 1997.
- B.7 Starner, T., J. Weaver, and A. Pentland, “Real-Time American Sign Language Recognition Using Desk and Wearable Computer-Based Video”, In *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Volume 20 (12), pp. 1371–1375, December 1998.
- B.8 Starner, T. and Y. Maguire, “Heat Dissipation in Wearable Computers Aided by Thermal Coupling with the User”, In *ACM Journal on Mobile Networks and Applications (MONET)*, Special Issue on Wearable Computers, Volume 4 (1), pp. 3–13, 1999.
- B.9 Leibe B., T. Starner, W. Ribarsky, Z. Wartell, D. Krum, J. Weeks, B. Singletary, and L. Hodges, “Towards Spontaneous Interaction with the Perceptive Workbench”, In *IEEE Computer Graphics and Applications*, Volume 20 (6), pp. 54–65, November 2000.
- B.10 Starner, T., B. Leibe, D. Minnen, T. Westeyn, A. Hurst, and J. Weeks, “The perceptive workbench: Computer-vision-based gesture tracking, object tracking, and 3D reconstruction for augmented desks”, In *Machine Vision and Applications*, Volume 14 (1), pp. 59–71, 2003.

- B.11 Ashbrook, D. and T. Starner, "Using GPS to Learn Significant Locations and Predict Movement Across Multiple Users", In *Personal and Ubiquitous Computing*, Volume 7 (5), pp. 275-296, October 2003.
- B.12 Paradiso, J. and T. Starner, "Energy Scavenging for Mobile and Wireless Electronics", *IEEE Pervasive Computing*, Volume 4(1), pp. 18-27, January 2005.
- B.13 Lyons K., T. Starner, and B. Gain. "Experimental Evaluations of the Twiddler One-handed Chording Mobile Keyboard." *HCI Journal* 21(4), pp. 343-392. Winter 2006.
- B.14 Ward J., P. Lukowicz, G. Tröster, and T. Starner. "Human Activity Recognition Using Body-Worn Microphones and Accelerometers." *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 28(10), pp. 1553–1567. October 2006.

C. Published Books and Parts of Books (Refereed)

C.1. Chapters in Books

- C.1.1 Pentland, A., I. Essa, M. Friedman, B. Horowitz, S. Sclaroff, and T. Starner. "The Thing-World Modeling System." In *Algorithms and Parallel VLSI Architectures*, pp. 425–434. E.F. Deprettere (editor), Elsevier Press, 1991.
- C.1.2 Friedmann, M., T. Starner, and A. Pentland. "Device Synchronization Using an Optimal Linear Filter." In *Virtual Reality Systems*, Earnshaw, Gigante, and Jones (editors), Academic Press, pp. 119-132, 1993.
- C.1.3 Starner, T. and A. Pentland. "Real-Time American Sign Language Recognition from Video Using Hidden Markov Models." In *Motion-Based Recognition*, M. Shah and R. Jain (editors), Kluwer Academic Publishers, Computational Imaging and Vision Series, pp. 227-243, 1996.
- C.1.4 Starner, T., J. Weaver, and A. Pentland. "A Wearable Computer Based American Sign Language Recognizer." In *Assistive Technology and Artificial Intelligence*, V. Mittal, H. Yanco, J. Aronis (editors), Springer Verlag, AI Series, pp. 84–96, 1998.
- C.1.5 Starner, T., B. Schiele, B. Rhodes, T. Jebara, N. Oliver, J. Weaver, and A. Pentland. "Augmented Realities Integrating User and Physical Models." In *Augmented Reality: Placing Artificial Objects in Real Scenes*, R. Behringer, G. Klinker, G. J. Klintner, and D. Mizell (editors), A. K. Peters Ltd., pp. 73-79, December, 1999.
- C.1.6 Schiele, B., T. Starner, B. Rhodes, B. Clarkson, and A. Pentland. "Situation Aware Computing with Wearable Computers." In *Fundamentals of Wearable Computers and Augmented Reality*, W. Barfield and T. Caudell (editors), Lawrence Erlbaum Press, pp. 511-538, 2001.
- C.1.7 Starner, T. and B. Rhodes. "Wearable Computers." In *Encyclopedia of Human-Computer Interaction*, W. Bainbridge (editor), Berkshire Publishing, Volume 2, pp. 797-802, 2004.
- C.1.8 Starner, T. and Paradiso, J. "Human Generated Power for Mobile Electronics." In *Low Power Electronics Design*, C. Piguet (editor), CRC Press, Chapter 45, pp. 45-1 – 45-35, 2004.
- C.1.9 M. Gandy, T. Westeyn, H. Brashear, and T. Starner. "Smart Technology for Aging, Disability and Independence: Computer and Engineering Design and Applications." A. Helal, M. Mokhtari, and B. Abdulrazak (editore), Wiley, Volume 2, Chapter 3.9, 2007.

D. Conference Presentations

D.1. Invited Keynote and Distinguished Lecture Addresses

- D.1.1 “Wearable Computing”, at *Ball State University Distinguished Colloquium Series*, 600 attendees. Muncie, IN, September 1996.
- D.1.2 “Wearable Computing and Augmented Reality.” Invited banquet speaker at *International Conference on Robotics and Automation (ICRA)*. 800 attendees. Albuquerque, NM, April 1997.
- D.1.3 “Wearables Life.” One of three invited keynotes at *Wearables Tokyo Symposium at Nicograph*. 1000 attendees. Tokyo, Japan, November 1998.
- D.1.4 “Wearable Computing Life.” One of three invited keynotes at *Fashion Institute of Technology annual faculty convocation*,. 70 attendees. New York, NY, May 1999.
- D.1.5 “The Everyday Use of Wearable Computers.” Invited keynote at *Interaction Homme-Machine (IHM)*. 200 attendees. Montpellier, France, November 1999.
- D.1.6 “Fundamental Problems in Wearable Computing.” Invited plenary at *Second Congreso Internacional de Ingenieria Electronica*. 1000 attendees. Veracruz, Mexico, March 2001.
- D.1.7 “Creating Intelligent Agents with Wearable Computers.” Invited keynote and paper. *Interaction2002* (annual conference sponsored by the Human Interface (SIGHI) and Groupware and Network Services (SIGGN) special interest groups of the Information Processing Society of Japan). 200 attendees. Tokyo, Japan. March 2002.
- D.1.8 “Creating Intelligent Agents with Wearable Computers.” at *Princeton Distinguished Lecture in Pervasive Computing*. 150 attendees. Princeton, NJ, April 2002.
- D.1.9 “Wearable Computers as Intelligent Agents,” Invited plenary at *Man-Machine Symbiotic Systems*. 180 attendees. Kyoto, Japan, November 2002.
- D.1.10 “Wearable Computers as Intelligent Agents,” at *University of Linz Computer Science Colloquium*. 200 attendees. Linz, Austria, November 2002.
- D.1.11 “Mobile One-Way Translator for American Sign Language.” One of three keynotes at *Applied Imagery Pattern Recognition (AIPR)*. 70 attendees. Cosmos Club, Washington, DC, October 2003.
- D.1.12 “Mobile Interfaces for Entertainment.” One of three keynotes at *ACM Conference for Advances in Computer Entertainment*. 200 attendees. Singapore, June 2004.
- D.1.13 “Wearable Computing: A Modern Lifestyle.” One the six invited plenary speakers at *ICMIT*. 400 attendees. Chongqing, China, September 2005.

D.2. Conference Presentations with Proceedings (refereed)

[Entries in bold indicate short or long papers in stringently reviewed, international conferences with low acceptance rates. In a few highly selective conferences, full papers may be presented as a poster. Such entries are also bolded.]

- D.2.1 Pentland, A., M. Friedman, B. Horowitz, S. Sclaroff, and T. Starner. “The ThingWorld Modeling System,” In *Proceedings of International Workshop on Algorithms and Parallel VLSI Architectures*, pp. 168–172, Pont-a-Mousson, France, June 1990.

- D.2.2** Friedmann, M., T. Starner, and A. Pentland. “Device Synchronization Using an Optimal Linear Filter.” In *ACM Proceedings of the Symposium on Interactive 3D Graphics*, Volume 26 (2), pp. 57-62, ACM Press, March 1992.
- D.2.3 Pentland, A., T. Starner, N. Etkoff, A. Masoiu, O. Oliyide, and M. Turk. “Experiments with Eigenfaces.” In *Proceedings of the Looking At People Workshop, IJCAI’93*, pp. 1-6, Chamberry, France, August 1993.
- D.2.4** Pentland, A., B. Moghaddam, and T. Starner. “View-Based and Modular Eigenspaces for Face Recognition.” In *IEEE Proceedings of Computer Vision and Pattern Recognition Conference*, pp. 84-91, Seattle, WA, July 1994.
- D.2.5** Starner, T., J. Makhoul, R. Schwartz, and G. Chou. “On-line Cursive Handwriting Recognition Using Speech Recognition Methods.” In *IEEE Proceedings International Conference on Acoustics, Speech, and Signal Processing*, pp. 125-128, April 1994.
- D.2.6 Wren, C., T. Darrell, T. Starner, M. Johnston, K. Russell, A. Azarbayejani, and A. Pentland. “Pfinder: A Real-Time System for Tracking People.” In *SPIE Conference on Real-Time Vision*, M. Bove (editor), Philadelphia, PA, July 1995.
- D.2.7** Starner, T. and A. Pentland. “Visual Recognition of American Sign Language Using Hidden Markov Models.” In *IEEE International Workshop on Automatic Face and Gesture Recognition*, pp. 189-194, Zurich, Switzerland, 1995.
- D.2.8 Russell, K., T. Starner, and A. Pentland. “Unencumbered Virtual Environments.” In *IJCAI Workshop on Entertainment and AI/Alife*, Montreal, Quebec, August 1995.
- D.2.9** Starner, T. and A. Pentland. “Real-Time American Sign Language Recognition from Video Using Hidden Markov Models.” In *IEEE International Symposium on Computer Vision*, pp. 265-270, Coral Gables, FL, 1995
- D.2.10 Wren C., A. Azarbayejani, T. Darrell, M. Johnson, K. Russell, T. Starner, and A. Pentland. “Hierarchical Classification for Human Body Tracking.” In *Proc. SPIE Integration Issues in Large Commercial Media Delivery Systems*, 2615, pp. 99-106, October, 1995.
- D.2.11** Rhodes, B. and T. Starner. “Remembrance Agent: A continuously running automated information retrieval system.” In *Proc. of Pract. App. of Intelligent Agents and Multi-Agent Tech (PAAM)*, London, April, 1996.
- D.2.12** Starner, T. and A. Pentland. “Real-Time American Sign Language Recognition from Video Using Hidden Markov Models.” In *AAAI Fall Symposium on Disabilities*. Cambridge, MA, November 1996.
- D.2.13** Jebara, T., C. Eyster, J. Weaver, T. Starner, and A. Pentland, “Stochasticks: Augmenting the Billiards Experience with Probabilistic Vision and Wearable Computers.” In *IEEE International Symposium on Wearable Computers*, Cambridge, MA, October 1997. [20 papers accepted for oral presentation of 110 submissions (18%). Overall acceptance was 34 (31%).] [18%]
- D.2.14** Starner, T., J. Weaver, and A. Pentland, “A Wearable Computing Based American Sign Language Recognizer.” In *IEEE International Symposium on Wearable Computers*, Cambridge, MA, October 1997. pp. 140–149. [20 papers accepted for oral presentation of 110 submissions (18%). Overall acceptance was 34 (31%).] [18%]
- D.2.15 A. Pentland, A. Pentland, M. Petrazzuoli, A. Gerega, and T. Starner. “The Digital Doctor: An Experiment in Wearable Telemedicine.” In *IEEE International Symposium on Wearable Computers*, Cambridge, MA, October 1997, pp. 173-174. [31%]

- D.2.16 T. Starner, D. Kirsh, and S. Assefa. "The Locust Swarm: An Environmentally-powered, Networkless Location and Messaging System." In *IEEE International Symposium on Wearable Computers*, Cambridge, MA, October 1997, pp. 169-170. [31%]
- D.2.17 **Starner, T. and Y. Maguire, "A Heat Dissipation Tutorial for Wearable Computing." In *IEEE International Symposium on Wearable Computers*, Pittsburgh, PA, October 1998.** [~30%]
- D.2.18 **Starner, T., B. Schiele, and A. Pentland, "Visual Contextual Awareness in Wearable Computing." In *IEEE International Symposium on Wearable Computers*, Pittsburgh, PA, October 1998. pp. 50-57.** [~30%]
- D.2.19 **Starner, T., B. Schiele, B. Rhodes, T. Jebara, N. Oliver, J. Weaver, and A. Pentland. "Augmented Realities Integrating User and Physical Models." In *IEEE International Workshop on Augmented Reality*, San Francisco, CA, November 1998.**
- D.2.20 Kidd, C., G. Abowd, C. Atkeson, I. Essa, B. MacIntyre, E. Mynatt, T. Starner, "The Aware Home: A Living Laboratory for Ubiquitous Computing Research", In *Proceedings of Second International Workshop on Cooperative Buildings 1999*, Editors, Streit, J. Siegel, V. Hartkopf, S. Konomi, Pittsburgh. LNCS 1670. Springer: Heidelberg, 1999.
- D.2.21 **T. Starner, B. Leibe, B. Singletary, and J. Pair. "MIND-WARPING: Towards Creating a Compelling Collaborative Augmented Reality Game." In *Proc. of ACM Intelligent User Interfaces*, New Orleans, LA, January 2000, pp. 256-259.** [~30%]
- D.2.22 **B. Leibe, T. Starner, W. Ribarsky, Z. Wartell, D. Krum, B. Singletary, and L. Hodges, "The Perceptive Workbench: Towards Spontaneous and Natural Interaction in Semi-Immersive Virtual Environments." IEEE Virtual Reality, New Brunswick, NJ, March 2000, pp. 13-20. Best Paper Award. [31 papers accepted for oral presentation of 93 submitted (33%). Overall acceptance was 44 (47%)]** [33%]
- D.2.23 K. Lyons, M. Gandy, and T. Starner. "Guided by Voices: An Audio Augmented Reality System." Intl. Conf. on Auditory Display (ICAD), Atlanta, GA, April 2000, pp. 57-62.
- D.2.24 G. Abowd, C. Atkeson, A. Bobick, I. Essa, B. MacIntyre, E. Mynatt, and T. Starner, "Living Laboratories: The Future Computing Environments Group at the Georgia Institute of Technology," In *ACM Extended Abstracts of the 2000 Conference on Human Factors in Computing Systems (CHI)*, The Hague, Netherlands, April 1-6, 2000, pp. 215-216.
- D.2.25 **W. Rungsrityotin and T. Starner, "Finding Location Using Omnidirectional Video on a Wearable Computing Platform." In *IEEE International Symposium on Wearable Computers*, Atlanta, GA, October 2000, pp. 61-68. [18 papers accepted for oral presentation of 57 paper submissions (32%).]** [32%]
- D.2.26 **T. Starner, J. Auxier, D. Ashbrook, and M. Gandy. "The Gesture Pendant: A Self-illuminating, Wearable, Infrared Computer Vision System for Home Automation Control and Medical Monitoring." In *IEEE International Symposium on Wearable Computers*, Atlanta, GA, October 2000, pp. 87-94. [18 papers accepted for oral presentation of 57 paper submissions (32%).]** [32%]
- D.2.27 K. Lyons, L. Harvel, and T. Starner. "A Context-based Document System for Wearable Computers." In *IEEE International Symposium on Wearable Computers*, Atlanta, GA, October 2000, pp. 187-188.
- D.2.28 **B. Leibe, D. Minnen, J. Weeks, and T. Starner, "Integration of Wireless Gesture Tracking, Object Tracking, and 3D Reconstruction in the Perceptive Workbench." Intl. Conf. on Computer Vision Systems, Vancouver, Canada, July 2001, pp. 73-92. [8% acceptance rate for oral presentations. Overall acceptance rate 28%.]** [8%]

- D.2.29 B. Singletary and T. Starner. "Learning Visual Models of Social Engagement." Intl. Work. on Recognition, Analysis, and Tracking of Faces and Gestures in Realtime Systems, Vancouver, Canada, July 2001, pp. 141-148.
- D.2.30 B. Singletary and T. Starner. (extended abstract reviewed) "Symbiotic interfaces for wearable face recognition." Human Computer Interaction International (HCII), New Orleans, LA, August 2001, pp. 813-817.
- D.2.31 B. Wong and T. Starner. (extended abstract reviewed) "Conversational Speech Recognition for Creating Intelligent Agents on Wearables." Human Computer Interaction International (HCII), New Orleans, LA, August 2001, pp. 823-827.
- D.2.32 D. Ashbrook, J. Auxier, M. Gandy, and T. Starner. (extended abstract reviewed) "Experiments in Interaction Between Wearable and Environmental Infrastructure Using the Gesture Pendant." Human Computer Interaction International (HCII), New Orleans, LA, August 2001, pp. 818-822.
- D.2.33 K. Lyons and T. Starner, "Mobile Capture for Wearable Computer Usability Testing." In *IEEE International Symposium on Wearable Computers*, Zurich, Switzerland, October 2001, pp. 69-76. [~30%]**
- D.2.34 D. Krum, O. Omoteso, W. Ribarsky, T. Starner, and L. Hodges. "Speech and Gesture Multimodal Control of a Whole Earth 3D Visualization Environment." VisSym, Barcelona, Spain, May 2002, pp. 195-200.
- D.2.35 D. Ashbrook and T. Starner, "Learning Significant Locations and Predicting User Movement with GPS." In *IEEE International Symposium on Wearable Computers*, Seattle, WA, October 2002, pp. 101-108. [21 papers accepted for oral presentation of 109 submissions (19%). Overall acceptance was 45 (41%)]** [19%]
- D.2.36 Minnen, D., I. Essa, and T. Starner, "Expectation Grammars: Leveraging High-Level Expectations for Activity Recognition" In *IEEE Proceedings of Computer Vision and Pattern Recognition Conference 2003*, Madison, Wisconsin, June 2003. pp. II-626-II-632. [Poster: 149 papers accepted for presentation of 900 submissions (23%).]** [23%]
- D.2.37 H. Brashear, T. Starner, P. Lukowicz, H. Junker, "Using Multiple Sensors for Mobile Sign Language Recognition." In *IEEE International Symposium on Wearable Computers*, White Plains, WA, October 2003, pp. 45-53. [22 papers accepted for presentation of 51 paper submissions (43%).]** [43%]
- D.2.38 M. Stäger, P. Lukowicz, N. Perera, T. von Büren, G. Tröster, and T. Starner, "Sound-Button: Design of a Low Power Wearable Audio Classification System." In *IEEE International Symposium on Wearable Computers*, White Plains, WA, October 2003, pp. 12-16. [22 papers accepted for presentation of 51 paper submissions (43%).]** [43%]
- D.2.39 K. Lyons, N. Patel, and T. Starner. "KeyMenu: A Keyboard Based Hierarchical Menu." In *IEEE International Symposium on Wearable Computers*, White Plains, NY, October 2003, pp. 240-241. [Poster: Approximately 50% of posters were accepted.] [50%]
- D.2.40 T. Westeyn, H. Brashear, A. Atrash, and T. Starner, "Georgia Tech Gesture Toolkit: supporting experiments in gesture recognition." In *ACM International Conference on Multimodal Interfaces*, Vancouver, BC, November 2003, pp. 85-92. [20 full papers accepted for oral presentation out of 128 submissions (16%). Overall acceptance was 49 (38%).]** [16%]
- D.2.41 K. Lyons, T. Starner, D. Plaisted, J. Fusia, A. Lyons, A. Drew, and E. Looney, "Twiddler Typing: One-Handed Chording Text Entry for Mobile Phones", In *ACM Conference Human Factors in Computing Systems (CHI)* Vienna, Austria, April 2004, pp. 671-678. [93 papers accepted out of 572 submissions (16%).]** [16%]

- D.2.42 T. Starner, C. Snoeck, B. Wong, and R. McGuire, “Use of Mobile Appointment Scheduling Devices”, In *ACM Conference Human Factors in Computing Systems (CHI)*, Vienna, Austria, April 2004. pp. 1501–1504. [Short Paper: 19% of short papers accepted.] [19%]**
- D.2.43 P. Lukowicz, J. Ward, H. Junker, M. Stäger, G. Tröster, A. Atrash, T. Starner, “Recognizing Workshop Activity Using Body Worn Microphones and Accelerometers”, In *Pervasive Computing 2004*. pp. 18–22. [19 papers accepted out of 212 submissions. Overall acceptance was 27 (13%).] [9%]**
- D.2.44 R. McGuire, J. Hernandez-Rebollar, T. Starner, V. Henderson, H. Brashear, and D. Ross. “Towards a One-Way American Sign Language Translator”, In *IEEE Intl. Conference on Automatic Face and Gesture Recognition*, Seoul, South Korea, May 2004. pp. 620–625. [Poster: Approximately 50% of posters were accepted.] [50%]
- D.2.45 T. Westeyn and T. Starner. “Recognizing Song-Based Blink Patterns: Applications for Restricted and Universal Access”, In *IEEE Intl. Conference on Automatic Face and Gesture Recognition*, Seoul, South Korea, May 2004. pp. 717–722. [Poster: Approximately 50% of posters were accepted.] [50%]
- D.2.46 K. Lyons, T. Starner, and D. Plaisted. “Expert Typing Using the Twiddler One Handed Chord Keyboard.” In *IEEE International Symposium on Wearable Computers*, Washington, DC, October 2004. pp. 94–101. [23% of long papers accepted. 29% acceptance overall.] [23%]**
- D.2.47 C. Metzger, M. Anderson, and T. Starner. “FreeDigiter: A Contact-free Device for Gesture Control.” In *IEEE International Symposium on Wearable Computers*, Washington, DC, October 2004. pp. 18–21. [Short Paper: 29% acceptance overall.] [29%]**
- D.2.48 T. Starner and D. Ashbrook, “Augmenting a pH Medical Study with Wearable Video for Treatment of GERD.” In *IEEE International Symposium on Wearable Computers*, Washington, DC, October 2004. pp. 194–195. [Poster: 29% acceptance overall.]
- D.2.49 K. Lyons, C. Skeels, T. Starner, C. Snoeck, B. Wong, D. Ashbrook. “Augmenting Conversations Using Dual-Purpose Speech.” *User Interface and Software Technology (UIST)*, Santa Fe, NM, November 2004. pp. 237–246. [24 long papers accepted out of 118 submitted. 20% acceptance rate.] [20%]**
- D.2.50 E. Clarkson, J. Clawson, K. Lyons, and T. Starner. “An Empirical Study of Typing Rates on mini-QWERTY Keyboards.” *CHI*, Portland, Oregon, April 2005. pp. 1288–1291. [Short Paper: 25% short papers accepted.] [25%]**
- D.2.51 S. Lee, V. Henderson, H. Hamilton, T. Starner, H. Brashear, S. Hamilton. “A Gesture-Based American Sign Language Game for Deaf Children.” *CHI*, Portland, Oregon, April 2005. pp. 1589–1592. [Interactive Poster: 16% of short paper submissions accepted as interactive posters; 25% short papers accepted.] [41%]
- D.2.52 K. Lyons, B. Gane, T. Starner, and R. Catrambone. “Improving Novice Performance on the Twiddler One-Handed Chording Keyboard.” *Intl. Forum on Applied Wearable Computing*, Zurich, Switzerland. March 2005. pp. 145–159.
- D.2.53 V. Henderson, S. Lee, H. Brashear, H. Hamilton, T. Starner, and S. Hamilton. “Development of an American Sign Language Game for Deaf Children.” *Interaction Design and Children (IDC)*, Boulder, CO, June 2005.
- D.2.54 S. Lee, V. Henderson, H. Brashear, T. Starner, S. Hamilton, and H. Hamilton. “User-centered Development of a Gesture-based American Sign Language Game.” *NTID Instructional Technology and Education of the Deaf Symposium*, Rochester, NY, June 2005. pp. MDC-1–MDC-8.

- D.2.55 D. Minnen, T. Starner, J. A. Ward, P. Lukowicz, G. Tröster. “Recognizing and Discovering Human Actions from On-body Sensor Data”, ICME, Amsterdam, The Netherlands, July 2005. [Poster: Acceptance rate was approximately 25% in 2004.] [~25%]
- D.2.56 K. Lyons and T. Starner. “Augmenting Cognition with Wearable Computers” Human Computer Interaction International (HCII), Las Vegas, NV, July 2005. (due to publisher, no page numbers available). [Poster: Acceptance rate was under 50%.] [~50%]
- D.2.57 D. Ashbrook, T. Westeyn, and T. Starner. “Dancing in the Streets: Smartphones and Gaming.” Electronic proceedings of Workshop on Ubiquitous Entertainment and Games at UbiComp conference. Tokyo, Japan. September 2005.
- D.2.58 K. Lyons, C. Skeels, and T. Starner. “Providing Support for Mobile Calendaring Conversations: An Evaluation of Dual-Purpose Speech.” Mobile HCI, September 2005. [Short Paper: 21% acceptance rate of short papers submitted.] [25%]**
- D.2.59 T. Westeyn, X. Bian, K. Vadas, T. Starner, and G. Abowd. “Recognizing Mimicked Autistic Self-Stimulatory Behaviors Using Hidden Markov Models.” In *IEEE International Symposium on Wearable Computers*, October 2005. [Short Paper: 4 short papers accepted of 35 submitted, including this one (11%). 8 long papers converted to short papers leading to a 34% acceptance rate.] [34%]**
- D.2.60 J. Clawson, K. Lyons, T. Starner, and E. Clarkson. “The Impacts of Limited Visual Feedback on Mobile Text Entry Using the mini-QWERTY and Twiddler Keyboards.” In *IEEE International Symposium on Wearable Computers*, October 2005. [16 full papers accepted from 63 submitted (25%). Best paper nomination.] [25%]**
- D.2.61 M. C. Doo, K. Lyons, and T. Starner. “The Korean Twiddler: One-handed Chording Text Entry for Korean Mobile Phones.” CHI Extended Abstracts, Montreal, Canada, April 2006, pp. 718–723. [Works-in-progress poster.]
- D.2.62 G. Schindler, T. Starner, and C. Metzger. “A Wearable Interface for Topological Mapping and Localization in Indoor Environments.” International workshop on location and context-awareness (LOCA), Dublin, Ireland. May 2006. [Full paper 24% acceptance rate.] [24%]**
- D.2.63 D. Minnen, T. Westeyn, T. Starner, J. Ward, and P. Lukowicz. “Performance Metrics and Evaluation Issues for Continuous Activity Recognition.” Performance Metrics for Intelligent Systems Workshop (PERMIS), Gaithersburg, MD, August 2006.
- D.2.64 K. Vadas, N. Patel, K. Lyons, T. Starner, and J. Jacko. “Reading On-the-Go: A Comparison of Audio and Hand-held Displays.” Mobile HCI, September 2006. [Full paper 24% acceptance rate.] [24%]**
- D.2.65 H. Brashear, K. H. Park, S. Lee, V. Henderson, H. Hamilton, and T. Starner. “American Sign Language Recognition in Game Development for Deaf Children.” ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), Portland, Oregon. October, 2006.
- D.2.66 D. Minnen, T. Starner, I. Essa, and C. Isbell. “Discovering Characteristic Actions from On-Body Sensor Data.” In *IEEE International Symposium on Wearable Computers*, Montreux, Switzerland, October 2006. [Nominated for best paper award. 8 long papers accepted of 44 submitted (18%).] [18%]**
- D.2.67 T. Westeyn, P. Presti, and T. Starner. “ActionGSR: A Combination Galvanic Skin Response–Accelerometer for Physiological Measurements in Active Environments.” In *IEEE International Symposium on Wearable Computers*, Montreux, Switzerland, October 2006. [Poster]

- D.2.68 D. Minnen, T. Starner, I. Essa, C. Isbell. “Improving Activity Discovery with Automatic Neighborhood Estimation.” Int. Joint Conf. on Artificial Intelligence (IJCAI), Hyderabad, India, January 2007. [Full paper poster 35% acceptance rate.] [35%]**
- D.2.69 D. Minnen, T. Westeyn, and T. Starner. “Recognizing Soldier Activities in the Field.” Body Sensor Networks (BSN), Aachen, Germany, March 2007.
- D.2.70 E. Clarkson, K. Lyons, J. Clawson, and T. Starner. “Revisiting and Validating a Model of Two-Thumb Text Entry.” ACM Conference Human Factors in Computing Systems (CHI). San Jose, CA. May 2007. [Short paper, approx. 25% acceptance rate.] [25%]**
- D.2.71 K. Lyons, H. Brashear, T. Westeyn, J. S. Kim, and T. Starner. (extended abstract reviewed) “GART: The Gesture and Activity Recognition Toolkit.” 12th International Conference on Human–Computer Interaction (HCII), Beijing, China. July, 2007.

D.3. Conference Presentations with Proceedings (non-refereed)

- D.3.1 T. Starner, B. Leibe, B. Singletary, K. Lyons, M. Gandy, and J. Pair. (invited paper) “Towards Augmented Reality Gaming.” Proc. of IMAGINA, Monte Carlo, January 2000.
- D.3.2 T. Starner. (invited paper) “Wearable Computers as Intelligent Agents.” Proc. of Interaction, Tokyo, Japan, March 2002,
- D.3.3 T. Starner. (invited paper) “Ubiquitous Mobile Interfaces.” NIDRR Wireless RERC State of the Technology Conference. Atlanta, GA. April 2004.
- D.3.4 T. Westeyn, P. Pesti, K. Park, and T. Starner. (invited paper) “Biometric Identification using Song-Based Eye Blink Patterns.” Human Computer Interaction International (HCII), Las Vegas, NV, July 2005.

D.4. Conference Presentations without Proceedings (abstract refereed)

- D.4.1 Pentland, A., I. Essa, M. Friedmann, B. Horowitz, S. Sclaroff, and T. Starner. “ThingWorld” Live Demonstration of the system at *ACM Computer Graphics, Second Interactive 3D Graphics Symposium*, Snowbird, UT., March 1990.
- D.4.2 Friedmann, M., I. Essa, B. Horowitz, S. Sclaroff, T. Starner, and A. Pentland. “Distributed ThingWorld” Live Demonstration of the system at *G-Tech, ACM SIGGRAPH Conference, '92*, Chicago, IL., August 1992.
- D.4.3 B. Blumberg, T. Darrell, T. Starner, K. Russell, M. Hlavac, M. Johnson, P. Maes, and A. Pentland. “ALIVE.” Live demonstration of room-sized, computer vision based augmented reality. AAAI Art Show, October 1994.
- D.4.4 T. Starner. “Environmental and Wearable Approaches to Ubiquitous Computing.” Boeing Workshop on Wearable Computer Systems. Renton, WA, August 1996.
- D.4.5 T. Starner and A. Pentland. “Computer-based Visual Recognition of American Sign Language.” Plenary speaker, Theoretical Issues in Sign Language Research. Montreal, Canada, September 1996.
- D.4.6 T. Starner and A. Pentland. “Image Understanding on Wearable Computers.” DARPA Workshop on Image Understanding. Invited poster. New Orleans, LA, November 1997.
- D.4.7 D. Ashbrook and T. Starner, “Enabling Ad–Hoc Collaboration Through Schedule Learning and Prediction.” Mobile Ad Hoc Collaboration Workshop (at CHI), Minneapolis, MN, April 2002.

- D.4.8 C. Snoeck and T. Starner, “Calendar Navigator Agent and Dialog Tabs” Live demonstration at User Interface and Software Technology (UIST), Vancouver, BC, November 2003.
- D.4.9 D. Ashbrook and T. Starner, “Activity analysis, recognition, and discovery.” CHI Workshop on Forecasting Presence and Availability. Vienna, Austria. April 2004.
- D.4.10 D. Minnen, T. Starner, I. Essa, and C. Isbell. “Activity Discovery: Sparse Motifs from Multivariate Time Series.” Snowbird Learning Workshop, Snowbird, Utah, April 2006.

D.5. Conference tutorials

- D.5.1 T. Starner. “Privacy.” Tutorial (3 hours) at In *IEEE International Symposium on Wearable Computers* Zurich, Switzerland, October 2001. 25 attendees.
- D.5.2 T. Starner and B. Rhodes. “Introduction to Wearable Computers” Tutorial (3 hours) at Pervasive Computing, Zurich, Switzerland, August 2002. 30 attendees.
- D.5.3 T. Starner. “Wearable Computers as Intelligent Agents,” Tutorial (3 hours) at Summer School on Ubiquitous and Pervasive Computing, Schloss Dagstuhl, Germany, August 2002. 60 attendees.
- D.5.4 T. Starner. “Power and Heat in Ubiquitous Computing,” Tutorial (1.5 hours) at Summer School on Ubiquitous and Pervasive Computing, Schloss Dagstuhl, Germany, August 2002. 60 attendees.
- D.5.5 T. Starner and B. Rhodes. “Introduction to Wearable Computers” Tutorial (3 hours) at In *IEEE International Symposium on Wearable Computers*, Seattle, WA, October 2002. 30 attendees.
- D.5.6 T. Starner and B. Rhodes. “Introduction to Wearable Computers” Tutorial (3 hours) at Mobisys, San Francisco, CA, May 2003.
- D.5.7 T. Starner and B. Rhodes. “Introduction to Wearable Computers” Tutorial (3 hours) at In *IEEE International Symposium on Wearable Computers*. White Plains, NY, October 2003. 25 attendees
- D.5.8 T. Starner and K. Lyons. “Mobile and Wearable Interfaces” Tutorial (2.5 hours) at In *IEEE International Symposium on Wearable Computers*. Arlington, VA October 2004. 33 attendees
- D.5.9 T. Starner. “Mobile and Wearable Human Computer Interaction” Tutorial (2.5 hours) at International Conference on Artificial Reality and Telepresence. Seoul, South Korea. November 2004. 60 attendees.

E. Other

E.1. Submitted Journal Papers

- E.1.1 K. Lyons, C. Skeels, and T. Starner. “Augmenting Conversations Using Dual-Purpose Speech.” Submitted to ACM Transactions on Computer Human Interface (ToCHI), August 2005.
- E.1.2 J. Clawson, K. Lyons, E. Clarkson, and T. Starner. “Mobile Text Entry: An empirical study and analysis of mini-QWERTY Keyboards.” Submitted to ACM Transactions on Computer Human Interface (ToCHI), August 2005.

E.2. Software and Hardware

- E.2.1 M. Friedmann, I. Essa, B. Horowitz, S. Sclaroff, T. Starner, and A. Pentland. "The ThingWorld System." A three dimensional solid modeling and sculpting system developed at the MIT Media Laboratory. Used in over 25 research institutions. 1988-1992.
- E.2.2 M. Turk, T. Starner, A. Pentland, "Eigenfaces." <ftp://whitechapel.media.mit.edu/pub/face-recognition.tar.Z> Face recognition software. 1991.
- E.2.3 J. Levine and T. Starner, "Twiddler driver." Drivers for Handykey's one-handed chording keyboard under Linux. 1996.
- E.2.4 B. Walter and T. Starner, "X11R6 for Private Eye display." Port of popular windowing system to a head-up display. 1996.
- E.2.5 B. Wenzel and T. Starner, "Sierra-state and sierra-mod." Linux utilities to perform diagnosis, set states, and use the Sierra Wireless PoquetPlus 210 cellular digital packet data (CDPD) modem. 1996.
- E.2.6 D. Kirsch, S. Assefa, and T. Starner, "Locust: An Experiment in Private Localization." Hardware and software for implementing a beacon-based infrared location system that preserves privacy. 1997.
- E.2.7 W. Rachelson, P. Presti, and T. Starner, Bluetooth accelerometer. 2001-2005.
- E.2.8 T. Westeyn, H. Brashear, A. Atrash, and T. Starner. "Georgia Tech Gesture Toolkit (GT2K)." A toolkit for creating gesture interfaces. 2003.
- E.2.9 K. Lyons, J. Fusia, D. Plaisted, and T. Starner, "Twidor." Tutor software for the Twiddler keyboard based on our experiments. 2005.

E.3. Published Papers (non-refereed)

- E.3.1 M. Billinghurst and T. Starner. "Wearable Devices: New Ways to Manage Information." *IEEE Computer*, 32(1), January 1999, pp. 57-64.
- E.3.2 T. Starner, B. Leibe, B. Singletary, K. Lyons, M. Gandy, and J. Pair. (informal review) "Exploring Mobile and Desk-based Gaming Appliances." Sidebar in "Survey on Information Appliances." *IEEE Computer Graphics and Applications (CGA)*, 20(3), May 2000, p. 22.
- E.3.3 T. Starner. "The Challenges of Wearable Computing: Part 1." *IEEE Micro*, 21(4), July 2001, pp. 44-52.
- E.3.4 T. Starner. "The Challenges of Wearable Computing: Part 2." *IEEE Micro*, 21(4), July 2001, pp. 54-67. (These articles were written to be part of a special issue on wearable computing but then split due to the length so as to be printed over two issues. However, an unexpected retraction in the second issue caused both parts to be printed in the same issue.)
- E.3.5 T. Starner. "Thick Clients for Personal Wireless Devices." *IEEE Computer*, 35(1), January 2002, pp. 133-135.
- E.3.6 T. Starner. "Wearable Computers: No Longer Science Fiction." *IEEE Pervasive Computing*, 1(1), January 2002, pp. 86-88.
- E.3.7 T. Starner. "Wearable Agents." *IEEE Pervasive Computing*, 1(2), April 2002, pp. 90-92.

- E.3.8 T. Starner. "The Role of Speech Input in Wearable Computing." *IEEE Pervasive Computing*, 1(3), July 2002, pp. 89-93.
- E.3.9 T. Starner. "Attention, Memory, and Wearable Interfaces," *IEEE Pervasive Computing*, 1(4), October 2002, pp. 88-91.
- E.3.10 T. Starner. "The Enigmatic Display." *IEEE Pervasive Computing*, 2(1), January 2003, pp. 133-135.
- E.3.11 M. Gandy, D. Ross, and T. Starner. "Universal Access and Wearable Aids." *IEEE Pervasive Computing*. 2(3), September 2003, pp. 19-23.
- E.3.12 T. Starner. "Powerful Change Part 1: Batteries and Possible Alternatives for the Mobile Market." *IEEE Pervasive Computing*. 2(4), December 2003, pp.86–88.
- E.3.13 T. Starner. "Keyboards Redux: Enabling mobile e-mail and other services with fast mobile text entry." *IEEE Pervasive Computing*. 3(3), September 2004.
- E.3.14 D. Dagon, T. Martin, and T. Starner. "Mobile Phones as Computing Devices: The Viruses are Coming!" *IEEE Pervasive Computing*. 3(4), December 2004.
- E.3.15 T. Starner, K. Lyons, and R. Grinter. "Missing the Wave? Scattershot Funding has its Costs." *IEEE Pervasive Computing*. 4(1), January 2005.
- E.3.16 T. Starner. "Design factors for wearable and environmental applications." (sidebar) *IEEE Pervasive Computing*. 4(2), September 2005, p. 15.
- E.3.17 T. Starner. "Wearable Computing for the Developing World" *IEEE Pervasive Computing*. 4(3), September 2005.

E.4. Technical Reports (not submitted elsewhere)

- E.4.1 T. Starner. "The Cyborgs Are Coming." MIT Media Laboratory Perceptual Computing Technical Report #318. July 1995. (Original written for Wired magazine November 1993 - unpublished).
- E.4.2 V. Henderson, R. Grinter, T. Starner. "Electronic Communication by Deaf Teenagers." GIT-GVU-05-34, GVU Center, College of Computing, Georgia Institute of Technology, October 2005.
- E.4.3 K. Vadas, K. Lyons, D. Ashbrook, J. S. Yi, T. Starner, and J. Jacko. "Reading on the Go: An Evaluation of Three Mobile Display Technologies." GIT-GVU-06-09, GVU Center, College of Computing, Georgia Institute of Technology, 2006.

E.5. Videos and Demonstrations

- E.5.1 T. Starner, K. Russell, C. Wren, M. Friedman, and A. Pentland. "Trans-Atlantic SURVIVE." Live demonstration of long-distance augmented reality gaming using computer vision for control. Schools Lecture, BT Laboratories, Martlesham, England, October 1994.
- E.5.2 B. Leibe, T. Starner, W. Ribarsky, Z. Wartell, D. Krum, B. Singletary, and L. Hodges. "The Perceptive Workbench." IEEE VR2000 video proceedings. March 2000.
- E.5.3 "The Beware Home" An Aware Home open house for In *IEEE International Symposium on Wearable Computers* and GVU demo days. This demonstration showcased work done by undergraduates in CS4801, IMTC, and professors in the CoC. 500 attendees. Atlanta, GA. October 2000.

- E.5.4 D. Ashbrook, E. Young, J. Auxier, M. Gandy, and T. Starner. "Gesture Pendant." Chicago Museum of Applied Art, Chicago, IL, February 2001
- E.5.5 D. Ashbrook, E. Young, J. Auxier, M. Gandy, and T. Starner. "The Aware Home: Gesture Pendant." ACM'01 Exposition, San Jose, CA, March 2001.
- E.5.6 T. Starner and H. Brashear. "Telesign: Mobile Sign Language Recognition." Demonstration to U.S. Congress. Coalition for National Science Funding Capitol Hill Science Exhibition, Washington, DC 2002.
- E.5.7 T. Starner. "Wearable Computing." CNN Headline News live demonstration, Atlanta, GA, September 2003.
- E.5.8 K. Lyons, D. Plaisted, and T. Starner. "Twiddler typing." CNN Headline News live demonstration, Atlanta, GA, September 2003.
- E.5.9 H. Brashear, V. Henderson, D. Ashbrook, T. Westeyn, and T. Starner. "Telesign: Mobile Sign Language Recognition." CNN Headline News live demo, Atlanta, GA, September 2003.
- E.5.10 H. Brashear, V. Henderson, H. Park, S. Lee, and T. Starner. "Telesign Mobile Sign Language Recognition and CopyCat ASL Tutor." CEASD, Atlanta, GA, April 2005.
- E.5.11 H. Brashear, V. Henderson, and T. Starner. "Telesign: Mobile Sign Language Recognition." RESNA, Atlanta, GA, June 2005.
- E.5.12 T. Westeyn, P. Pesti, and T. Starner. "Blinki: Appliance control through eyeblinks." RESNA, Atlanta, GA, June 2005.

F. Research Proposals and Grants (Principal Investigator)

a. Approved and Funded

1. **Computer-Environment Interactions**
 B. Singletary, T. Starner, and C. Atkeson Broadband Telecommunications Center
 Amount Requested: \$60,000 plus equipment, March 1999.
 Result: Funded and renewed (7/1/1999-7/1/2000).
2. **Application and Exploration of Wearable Computers and Intelligent Environments**
 T. Starner and B. Singletary
 Broadband Institute
 Amount Requested: \$30,000, April 2000.
 Result: Funded (7/1/2000-7/1/2001).
3. **Developing Contextual Cues for Just-in-time Information Retrieval on Wearable Computers**
 T. Starner
 NSF-CAREER Program 2001
 Amount Requested: \$549,738, July 2000.
 Result: Funded (2/1/2001-2/1/2006)
4. **Application and Exploration of Wearable Computers and Intelligent Environments**
 T. Starner and B. Singletary
 Broadband Institute
 Amount Requested: \$30,000, April 2001.
 Result: Renewal (7/1/2001-7/1/2002).

5. **Telesign**
T. Starner and H. Brashear
GVU
Amount Requested: one 9-month GRA (~\$20,000), Sept. 2001.
Result: Funded (10/1/2001-5/1/2002).
6. **Undergraduate Opportunities Developing Contextual Cues for Just-in-time Information Retrieval on Wearable Computers**
T. Starner
NSF-CAREER REU addition 2002
Amount Requested: \$19,825, February 2002.
Result: Funded (2/28/2002-2/28/2003)
7. **Workshops in Wearable Computing**
T. Starner
DARPA, Augmented Cognition
Amount Requested: \$15,000 May 2002
Result: Funded (6/2002).
8. **ETH/Georgia Tech On-Campus Cooperative Research in Wearable Computing**
T. Starner
ETH (Swiss Federal Institute of Technology Zurich) Wearable Computing Laboratory
Amount Requested: 70,500CHF
Result: Funded (6/2002-12/2002).
9. **Favor Exchange Through Location Prediction Based on GPS**
T. Starner
Orange
Amount Requested: \$16,044 in equipment and service.
Result: Gifted (7/2002-12/2002).
10. **Augmenting a Program Manager**
T. Starner
DARPA, Cognitive Systems seedling Amount Requested: \$100,000 October 2002
Result: Funded (2/2003).
11. **The Gesture Panel: Low Cognitive Load Control of Car Automation Through Gross Gesture**
T. Starner
Daimler Chrysler
Amount: \$32,500
Result: Gifted (2/2003)
12. **Recognizing Blink Patterns for Development of Assistive Technologies**
GVU
T. Westeyn, T. Starner, M. Moore, and S. Sprigle
Amount Requested: one 9-month GRA (~\$20,000), Sept. 2003.
Result: Funded (2003-2004).
13. **Undergraduate Opportunities Developing Contextual Cues for Just-in-time Information Retrieval on Wearable Computers 2004**
T. Starner
NSF-CAREER REU addition 2004
Amount Requested: \$19,825, December 2004.
Result: Funded (2/28/2004-2/28/2005)

14. **Undergraduate Opportunities Developing Contextual Cues for Just-in-time Information Retrieval on Wearable Computers 2005**
T. Starner
NSF-CAREER REU addition 2005
Amount Requested: \$30,000, October 2004.
Result: Funded (2/28/2005–2/28/2006)
15. **Telesign: Towards a One-Way American Sign Language Translator**
T. Starner
NSF Universal Access
Amount Requested: \$749,000 over 3 years, December 2004.
Result: Funded \$550,001 (4/15/2005–4/15/2008)
16. **GroupWear**
T. Starner, A. Pentland, I. Essa, G. Abowd, C. Isbell, E. Price, S. Intille, and H. Lieberman
DARPA IPTO ASSIST
Amount Requested: \$1.99 million over 1 year with options.
Result: Combined with IBM proposal and funded at \$2,169,326 (GT share: \$659,815) over 1 year. \$1,424,235 (\$526,174) 6-month option to be negotiated.
17. **Enhancing Tactical Decision-Making in Navy Seal Operations**
T. Starner and B. Singletary (Applied Systems Intelligence, Inc.)
Office of Naval Research SBIR
Amount Requested: \$100,000 (GT share: \$30,000+), January 2005.
Result: Funded (5/19/2005–11/19/2005)
18. **Mobile Gesture Interfaces**
T. Starner
ETRI (Korea)
Amount Requested: \$80,000, August 2005
19. **Inexpensive, Mobile Wound Measurement**
T. Starner
CATEA
Amount Requested: ~\$10,000 (1 GRA semester), May 2005.
Result: Funded (8/2005-12/2005)

b. Pending

1. **CopyCat: Learning Through Signing**
T. Starner, H. Hamilton, A. Bruckman, H. Brashear, and V. Henderson
NIDRR
Amount Requested: \$450,000 over 3 years, February 2006

c. Not Funded (last three years)

1. **Development of a Mobile American Sign Language Recognition System**
T. Starner, J. Goldthwaite, H. Brashear, and M. Prow
NIDRR
Amount Requested: \$450,000 over 3 years, 2002
2. **Development of a Mobile American Sign Language Recognition System**
T. Starner, J. Goldthwaite, H. Brashear, and M. Prow
NIH (NIDCD)
Amount Requested: \$800,000 over 3 years, 2002

3. **LifeWear**
T. Starner, A. Pentland, G. Abowd, C. Isbell, M. Minsky, D. Roy, P. Maes, R. Picard, and H. Lieberman DARPA (BAA canceled)
Amount Requested: \$7 million over 3.5 years (18 months + option), 2003
4. **Telesign: Learning Through Signing**
T. Starner
NIH
Amount Requested: \$600,000 over 3 years, 2004.

G. Research Proposals and Grants (Contributor)

a. Approved and Funded

1. **Augmenting the Capture and Understanding of Everyday Experiences**
NSF-CISE Research Instrumentation grant.
G. Abowd, C. Atkeson, I. Essa, B. MacIntyre, B. Mynatt, C. Potts, U. Ramachandran, B. Ribarsky, S. Rugaber, and T. Starner.
Amount Requested: \$160,000 (including \$40,000 matching from Georgia Tech).
Result: Funded (2/15/1999–1/31/2002)
2. **A Distributed Programming Infrastructure for Integrating Smart Sensors**
U. Ramachandran, T. Starner, S. Deweerth, K. Mackenzie
NSF ITR/SY
Funded: \$1,350,000 (9/1/2001 - 9/30/2006)
3. **Aware Home Research Initiative.**
A consortium of companies that includes Intel, MERL, Motorola, Accenture, and Hewlett Packard.
G. Abowd, A. Bobick, I. Essa. B. Macintyre, B. Mynatt, and T. Starner.
Funded: ~\$410,000 per year.
Consortium Established: Summer 2000.
4. **Indoor Orientation and Wayfinding Aid for Vision Loss**
J. Devita, D. Ross, and T. Starner
NIH SBIR (through Charmed Technology)
Amount Requested: \$100,000 August 2002
Result: Granted (1/2003)
5. **Rehabilitation Engineering Research Center Mobile Wireless Technologies for Persons With Disabilities**
National Institute on Disability and Rehabilitation Research
A collaboration of GCATT, Shepherd Center, and Georgia Tech.
Funded: \$5,000,000 (2002-2006).
6. **Point of Care Support for Pediatric Clinicians using Nomadic Computing**
GVU
J. Jacko, B. Walker, and T. Starner.
Amount Requested: one 9-month GRA (~\$20,000), July 2005.
Result: Funded (2005-2006).

H. Research Honors and Awards

1. United States Air Force Laboratory Graduate Fellow. One of 25 chosen from 2031 applicants. Provides for full expenses for three years towards a Ph.D.

2. Named one of MIT Technology Review's TR100. "100 individuals under 35 who exemplify the spirit of innovation." November 1999.
3. Best Paper Award, IEEE VR2000. "The Perceptive Workbench: Towards Spontaneous and Natural Interaction in Semi-Immersive Virtual Environments." March 2000.
4. NSF CAREER Award, 2001.
5. Named one of Georgia Trend magazine's Top 40 under 40. "40 rising stars in business, education, and politics." October 2001.
6. Research group featured on www.innovations.gatech.edu 2002
7. SAIC Best Student Paper Award for David Krum with "Speech and Gesture Multimodal Control of a Whole Earth 3D Visualization Environment," 2002
8. SAIC Best Student Paper Award for Daniel Ashbrook with "Learning Significant Locations and Predicting User Movement with GPS," 2003
9. Nominated by Georgia Tech for the NIH Director's Pioneer Award (~3.75M\$ over 5 years). Finalist 2004.
10. Profile featured on Georgia Tech's main web site 2004.
11. Nominated for Best Paper Award, IEEE In *IEEE International Symposium on Wearable Computers* 2005.
12. Nominated for Best Paper Award, IEEE In *IEEE International Symposium on Wearable Computers* 2006.

III. SERVICE

A. Professional Activities

A.1. Memberships and Activities in Professional Societies

- Institute of Electrical and Electronics Engineers (IEEE) Computer Society.
- IEEE Technical Committee on Wearable Information Systems
- Association for Computer Machinery.

A.2. Conference Committee Activities

1. Founder and local arrangements chair, ISWC 1997, *IEEE International Symposium on Wearable Computers*.
2. Publicity Co-chair, ISWC 1999.
3. General Co-chair, ISWC 2000.
4. Publicity Chair, ISWC 2003.
5. Co-chair Interfaces for Wearable Computers workshop at IEEE VRAIS 1998.
6. Program Committee, ISWC 1998, ISWC 2003, ISWC 2004, ISWC 2005, *IEEE International Symposium on Wearable Computers*.

7. Program Committee, UIST 2005, ACM SIGCHI/SIGGRAPH Symposium on User Interface Software and Technology.
8. Program Committee, Boeing Workshop on Wearable Computers 1996.
9. Program Committee, ICMI-PUI 2003, International Conference on Multimodal Interfaces - Perceptual User Interfaces.
10. Program Committee, ICMI 2002, International Conference on Multimodal Interfaces.
11. Program Committee, Pervasive Computing 2004.
12. Program Committee, ISAR 2000, International Symposium Augmented Reality.
13. Program Committee, ISMR 2001, International Symposium Mixed Reality.
14. Program Committee, ISMAR 2002, International Symposium Mixed and Augmented Reality.
15. Program Committee, IFAWC 2005, International Forum on Applied Wearable Computing.
16. Paper Reviewer, CHI 2004, ACM Conference on Human Factors in Computing Systems.
17. Paper Reviewer, UIST 1999, UIST 2000, UIST 2001, UIST 2003, UIST 2004, ACM SIGCHI/SIGGRAPH Symposium on User Interface Software and Technology.
18. Paper Reviewer, IEEE Virtual Reality 2004.
19. Paper Reviewer, Ubicomp 2004.
20. Paper Reviewer, ACM SIGGRAPH Emerging Technology 2005.
21. Paper Reviewer, Mobisys 2003, International Conference on Mobile Systems, Applications, and Services.
22. Paper Reviewer, ISMAR 2003, International Symposium Mixed and Augmented Reality.
23. Paper Reviewer, PUI 2001, Perceptual User Interface.
24. Paper Reviewer, IEEE Multimedia 1999.

B. On-Campus Georgia Tech Committees

1. 1999-2000 College of Computing, Undergraduate Opportunities in Computing.
2. 2001-2004 General Faculty Assembly.
3. 2002-2004 College of Computing, Awards Committee.
4. 2003-2004 College of Computing, Faculty Recruiting Committee.

C. Special Assignments at Georgia Tech

1. Fall 2003 College of Computing, Ad Hoc Committee on PhD student funding,

D. External Member of Ph.D. Examining Committees

1. Rich DeVaul, MIT Media Laboratory., June 2004.
Thesis Title: “.”
Principal Advisor: Dr. Alex Pentland

E. Consulting, Advisory, and Other External Appointments

- Scientific Advisor, WearIT@Work EU Framework 6 grant, Bremen Germany, 2004–present.
- Consultant, Synectics, Cambridge, MA 2004.
- Consultant, BrownTech, Atlanta, GA 2004.
- Consultant, LECG, Palo Alto, CA 2004.
- Consultant, Charmed Technology, Santa Monica, CA 1999-2003.
- Consultant, Teltech, Minneapolis, MN 1998.
- KTAADN,Inc. 1998.
- Audio Velocity, Cambridge, MA 1997.

IV. NATIONAL AND INTERNATIONAL PROFESSIONAL RECOGNITION

A. Invited Conference Session Chair

1. Boeing Workshop on Wearable Computer Systems 1996, Renton, WA.
2. ISWC 1998, ISWC 2003, ISWC 2005.
3. Face and Gesture 2004.
4. IFAWC 2005.
5. Many more than I can remember.

B. Editorial and Reviewer Work for Technical Journals and Publishers

1. Wearable Computing department editor, Pervasive Computing 2002-2006.
2. Reviewer, IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), International Journal Human Computer Systems (IJHCS), Pattern Recognition Letters, Journal of Artificial Intelligence Research (JAIR), Computer Vision and Image Understanding, IEEE Transactions on Robotics, IEEE Transactions on MultiMedia, ACM Journal on Special Topics in Mobile Networking and Applications (MONET), IEEE Computer Graphics & Applications (CGA), Graphical Models and Image Processing, Presence, Personal and Ubiquitous Computing, IBM Systems Journal, IEEE Pervasive Computing magazine, and several other leading journals for Human Computer Interaction, Computer Vision, and Pattern Recognition.

C. Patents

1. "Method and System for Facilitating Wireless, Full-Body, Real-Time User Interaction with a Digitally Represented Visual Environment." P. Maes, B. Blumberg, T. Darrell, T. Starner, M. Johnson, K. Russell, and A. Pentland. Awarded October 8, 1996 (US5563988).
2. "Method and Apparatus for Automated, Context-Dependent Retrieval of Information." B. Rhodes, T. Starner, P. Maes, and A. Pentland. Awarded May 22, 2001 (US6236768).
3. "Method and System for Data Transmission Between Wearable Devices or From Wearable Devices to Portal." A. Lightman, A. Pentland, T. Starner, J. Pair, K. Russell, B. Jordan, and R. Hoffman. Awarded June 29, 2004 (US6757719)
4. "Magnetic mount eyeglasses display system," T. Starner and D. Ashbrook. Regular utility filing July, 2001. Approved and awaiting issuance 2005.
5. "FreeDigiter: A Contact-Free Device for Gesture Control" T. Starner and C. Metzger. Provisional patent filed June, 2004. Abandoned due to lack of sponsorship.
6. "Gesture Pendant," T. Starner, J. Auxier, D. Ashbrook, and M. Gandy. Regular utility filing July, 2001. Abandoned due to lack of sponsorship.
7. "The Perceptive Workbench," B. Leibe, T. Starner, J. Weeks, and D. Minnen. Provisional patent filed October, 2000. Abandoned due to lack of sponsorship.

V. OTHER CONTRIBUTIONS

A. Seminar Presentations (Invited Papers and Talks at Meetings and Symposia)

1. BBN, Speech Systems. "Eigenfaces." Cambridge, MA, August 1992.
2. CSIRO. "On-line Cursive Handwriting Recognition Using Speech Recognition Methods." Sydney, Australia, 1994.
3. IBM T J Watson Laboratory. "Augmenting Humans." Gossining, NY, September 1994.
4. Boston University, ACM chapter. "Wearable Computing." Boston, MA, March 1995.
5. Motorola, New Enterprises. "Wearable Computing." Schaumburg, IL, March 1995.
6. BBN Speaker Series. "Wearable Computing." Cambridge, MA, April 1995.
7. Wright Patterson Air Force Base, Crew Systems Directorate. "Face Recognition, Augmented Realities, and Wearable Computing." Dayton, OH, October 1995.
8. CPSI (now Xybernaut) Wearable Computing Workshop. "Consumer Applications of Wearable Computing." Invited presentation. Fairfax, VA, October 1995.
9. Sandia National Laboratories. "Wearable Computing." Albuquerque, NM, November 1995.
10. Carnegie Mellon University. "A Wearable Computing Approach to Intellectual Augmentation Through User Modeling and Prediction." Pittsburgh, PA, January 1996.
11. IBM Almaden Research Laboratory. "MIT Media Lab Research in Wearable Computing." San Jose, CA, April 1996.
12. Boston Computer Society, VR group. "Augmented Reality." Cambridge, MA, April 1996.
13. DARPA Energy Harvesting Workshop. "Human Powered Wearable Computing." Invited presentation. La Jolla, CA, July 1996.
14. MIT Entrepreneur's Club. "The Emerging Market for Portable Consumer Electronics." Cambridge, MA, September 1996.
15. Mitsubishi Electric Research Laboratory. "Wearable Computing." Cambridge, MA, October 1996.
16. Georgia Institute of Technology. "A Wearable Computing Approach to Intellectual Augmentation Through User Modeling and Prediction." Atlanta, GA, December 1996.
17. Fedex Workshop on Wearable Computing. "Living with Wearables." Panel member. Memphis, TN, January 1997.
18. Cyberposium, Harvard Business School (annual conference). "The Emerging Market for Portable Consumer Electronics." Cambridge, MA, February 1997.
19. University of Rochester computer science seminar. "Research Issues in Wearable Computing." Rochester, NY, February 1997.
20. CHI Wearables Workshop. "Wearable Computing Augmented Realities." Plenary speaker. Atlanta, GA, March 1997.
21. Greater New Hampshire Linux Group. "Wearable Computing for the Hobbyist." Nashua, NH, May 1997.

22. Boston Computer Society, Linux Group. "Wearable Computing and the Operating System Challenge." Cambridge, MA, July 1997.
23. Digital, Western Research Laboratory. "Wearable Computing, Augmented Memory, and Augmented Reality." Palo Alto, CA, September 1997.
24. IBM T J Watson Laboratory. "Wearable Computing and Contextual Awareness." Yorktown Heights, NY, May 1998.
25. Identity, Formation, Dignity (conference). "What Is the Identity of a Cyborg?" Panel speaker. Sponsored by the Boston Theological Institute (BTI), MIT Artificial Intelligence Laboratory, and the Center for Faith and Science Exchange (FASE). Cambridge, MA, May, 1998.
26. IEEE ISWC (annual conference). "Privacy, Wearable Computers, and Recording Technology." Panel speaker. Pittsburgh, PA, October 1998.
27. CHI-Atlanta. "Everyday-use Wearable Computing." Atlanta, GA, July 1999.
28. O'Reilly Open Source Software Conference (annual). "Linux in Wearable Computing Research." Invited presentation. Monterey, CA, July, 1999.
29. ACM Mobicom (annual conference). "Wearable Computing." Panel speaker. Seattle, WA, August 1999.
30. Atlanta Linux Showcase (annual conference). "Linux in Wearable Computing Research." Invited presentation. Atlanta, GA, October, 1999.
31. Spelman University. "Contextual Awareness Using Wearable Computing." Atlanta, GA, November 1999.
32. TTVanguard: The New Geography of Business. "Challenges of Wearable Computing and Contextual Awareness." Invited presentation. Amsterdam, The Netherlands, July 19, 2000.
33. Linux Business Expo (annual conference). "Embedded Linux." Panelist. Atlanta, GA, September 2000.
34. MITRE. "Wearable Computing and Contextual Awareness." Boston, MA, February 2001.
35. Viant. "Commercial Markets for Wearable Computing." Luminaries on the Lips seminar. Boston, MA, March 2001.
36. MIT Club Atlanta. "Challenges of Wearable Computing." Atlanta, GA, March 2001.
37. BBN. "Challenges of Wearable Computing." Cambridge, MA, May 2001.
38. Southeast Regional Internet Society (SERIS). "Businesses in Wearable Computing." Atlanta, GA, May 2001.
39. Georgia State University eCommerce Institute's Global eManagement (GEM) program. "Businesses in Wearable Computing." Atlanta, GA, May 2001.
40. Ubicomp: Workshop on Perception in Ubiquitous Computing. "Perception in Wearable Computing." Invited presentation. Atlanta, GA, September 2001.
41. Visteon. "Mobile Gesture Recognition." Dearborn, MI, June 2001.
42. Tech-U-Wear (conference). "Living on the Bleeding Edge: Lessons (not) Learned." New York City, New York Oct. 31, 2001.

43. Osaka Electro-Communication University 40th Anniversary Commemorative International Symposium. "Wearable Computers as Intelligent Agents." Invited presentation and paper. Osaka, Japan. November 2001.
44. First CREST Workshop on Advanced Computing and Communicating Techniques for Wearable Information Playing. "Wearable Computers as Intelligent Agents." Invited presentation and paper, Nara Institute of Science and Technology (NAIST). 200 attendees. Nara, Japan. March
45. IBM Zurich. "Wearable Computers as Intelligent Agents." Zurich, Switzerland, September 2002.
46. Quidnunc. "Wearable Computers in Financial Markets," London, United Kingdom, December 2002.
47. Pervasive Computing (annual conference). "Pervasive Computing Reality or Myth." Panel member. Ft. Worth, Texas. March 2003.
48. International Symposium on Modern Computing: in celebration of John Vincent Atanasoff's 100th birthday. "Wearable Computers: the Next Cusp in Computing?" 200 attendees. Ames, Iowa. October 2003.
49. First International Workshop on Ubiquitous Systems for Supporting Social Interaction and Face-to-Face Communication in Public Spaces. "Using Social Conversation to Control Wearable Interfaces." Seattle, WA, October 2003.
50. New Jersey Intitute of Technology seminar. "Augmenting Face to Face Conversation with Wearable Computing." Newark, New Jersey. April 2004.
51. Samsung DM. "Wearable Computing Today and Tomorrow." Suwon, South Korea. May 2004.
52. Samsung Advanced Institute of Technology (research lab). "Ubiquitous Mobile Interfaces. " Suwon, South Korea. May 2004.
53. KAIST (university). "Applying Speech Technology to Mobile Gesture Recognition." Daejeon, South Korea. May 2004.
54. ETRI (research lab). "Wearable Comptuing Today and Tomorrow." Daejeon, South Korea. May 2004.
55. Georgia Tech BACKUP event for alumni. "Mobile Interfaces Using Wearable Computing." Atlanta, GA. October 2004.
56. Xerox PARC Computer Science Laboratory Colloquium. "Interfaces for Augmenting Face-to-Face Conversation." Palo Alto, CA. March 2005.
57. Stanford Human-Computer Interaction Seminar. "Interfaces for Augmenting Face-to-Face Conversation Using Wearable Computers." Stanford, CA. April 2005.
58. University of California, Irvine HCI Seminar. "Interfaces for Augmenting Face-to-Face Conversation Using Wearable Computers." Irvine, CA. April 2005.
59. CMU HCII Seminar Series. "Interfaces for Augmenting Face-to-Face Conversation Using Wearable Computers." Pittsburgh, PA. April 2005.
60. Georgia Tech Library Lecture Series (Tuesday Talks). "Face to Face Discussion with Wearable Computers." Atlanta, GA. April 2005

61. Stanford Computer Forum Mobile Interaction Workshop. "Interfaces for Augmenting Face-to-Face Conversation Using Wearable Computers." Stanford, CA. May 2005.
62. Human Systems Integration Symposium (HSIS). "Man-Computer Symbiosis: Computing in Everyday Life." Panel presentation on HSIS in 2020. Washington, DC. June, 2005.
63. Rehabilitation Engineering and Assistive Technology Society of North America annual conference (RESNA). "Using Mobile Wireless Technology in Rehabilitation and Community Reintegration- Critical Considerations." Panel presentation on mobile device trends and possibilities. Atlanta, GA. June, 2005.
64. SIGGRAPH. "Extreme Fashion." Panel presentation on wearable computing and fashion. Los Angeles, CA. August, 2005.
65. Chengdu Science and Technology University. "Wearable Computers: New Interface Possibilities." Chengdu, China. September, 2005.
66. Georgia Tech Homecoming lecture. "Interfaces for Augmenting Face-to-Face Conversation Using Wearable Computers." Atlanta, GA. October, 2005.
67. Georgia State University Ubiquitous Computing class. "Wearable Computing: Computing for developing regions, approaches for artificial intelligence, and communication aids." Atlanta, GA. February, 2006.
68. Georgia Tech Global Executive MBA class. "The Marching Cello: on-the-go vs. mobile computing." Atlanta, GA. October, 2006.