BRYGG A. ULLMER

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WORK EXPERIENCE

Zuse Institute Berlin (ZIB), Visualization Department – Postdoctoral researcher
October 2002 – present

Postdoctoral researcher supported by the EC "GridLab" grid computing project.

Developed grid-enabled tangible interfaces for facilitating collaborative simulation, visualization, and presentations, and grid-enabled visualization services and spreadsheets.

Collaborated with and received a grant from the Max Planck Institute for Gravitational Physics toward deployment of tangible interfaces for daily use by scientists.

Hong Kong Polytechnic University, School of Design – Visiting lecturer
November-December 2002

Taught a five-week projects course titled "Giving Physical Form to Digital Information."

MIT Media Laboratory, Tangible Media group – Research assistant
August 1995-August 2003

First student and Ph.D. graduate of the Tangible Media group with Prof. Hiroshi Ishii, closely involved in group's formation

Developed user interfaces for physically representing and manipulating abstract digital information, such as online media and database queries. Results published in SIGGRAPH, CHI, UIST, et al.

Teaching assistant: "Tangible Interfaces," 1996-99; "Issues in Tangible Interfaces," 1999; "How to Make (Almost) Anything," 1999-2001.

Hired and managed eleven undergraduate students

Systems administration of Linux, Irix, and Windows NT/2000/98 platforms

Co-manager of laboratory's laser cutter and mini-mill

Originally a research assistant in the Visible Language Workshop (VLW), exploring 3D graphical representations of Internet content using urban metaphors

Sony CSL (Tokyo) – Student intern
Summer 2000

Research on mixed physical & graphical user interfaces with Dr. Jun Rekimoto

Results published in CHI 2001

Interval Research Corporation (Palo Alto, California) – Student intern
January-August 1995; Summers 1993-94

Research on news systems integrating video, audio, text, and Internet connectivity

Research on 3D graphical interfaces for representing high bandwidth information flows with Professor Terry Winograd

Internal development of Web-based technologies

Co-inventor on three patents

University of Illinois, Urbana-Champaign – Volunteer and hourly employee
1991-94 (part time)

User interface development in NCSA's Virtual Reality Lab
Initiator and consultant for C-SPAN Internet connectivity project
Member of university committee guiding digital information infrastructure for UIUC's Grainger Engineering Library and Information Center
Creator of the "Personal Gopher," an early personal hyperlink management tool
Presented short courses, lectures, and articles on resources of the Internet
Administered IBM PC and Macintosh labs and networks (Campus Honors Program)

Summus, Ltd. (Columbia, South Carolina) – Consultant
1991-92 (part time)

Programmed user interfaces for wavelet-based image compression

University of South Carolina Mathematics Department – Student intern
Summers 1990-92

Software development for scientific visualization and wavelet-based image compression
Creator of the USC-Math Gopher service, an early hierarchy of Internet-wide hyperlinks
Involved in creation and support of the *Wavelet Digest* (now >18 thousand subscribers)

Hansley Industries (Columbia, South Carolina) – Hourly programmer
Summers 1987-89

Database programming and PC systems administration

EDUCATION

Massachusetts Institute of Technology
Ph.D., Program in Media Arts and Sciences (MIT Media Laboratory)
Dissertation title: "Tangible interfaces for manipulating aggregates of digital information"
Committee: Profs. Hiroshi Ishii, John Maeda, and Robert Jacob (Tufts)
Graduated September 2002

Massachusetts Institute of Technology
M.S., Program in Media Arts and Sciences (MIT Media Laboratory)
Thesis title: "Models and Mechanisms for Tangible User Interfaces"
Committee: Profs. Hiroshi Ishii, Mitchel Resnick, and Terry Winograd (Stanford)
Graduated June 1997

University of Illinois at Urbana-Champaign
B.S., Computer Engineering (Chancellor's Scholar)
Graduated December 1994

IBM Media Lab Fellow, 1998-2002; Mitsubishi Media Lab Fellow, 1996-98;
AT&T Media Lab Fellow, 1995-96

Selected coursework:

User interface design, electronics design, physical fabrication, computer networks, bioengineering, technology strategy, economics, psychology, video production, graphic design, urban design

PUBLICATIONS

Journal-level Papers and Book Chapters

Ullmer, B., Ishii, H., and Jacob, R. (2004). Token+Constraint Systems for Tangible Interaction with Digital Information. Accepted for publication in *ACM Transactions on Human-Computer Interaction,* special issue on sensing-based interaction.

Ullmer, B., and Ishii, H. (2001). Emerging Frameworks for Tangible User Interfaces. In *Human-Computer Interaction in the New Millenium*, John M. Carroll, ed. Boston: Addison-Wesley, 2001, pp. 579-601.

Ullmer, B., and Ishii, H. (2000). Emerging Frameworks for Tangible User Interfaces. In *IBM Systems Journal*, v39, n3-4, pp. 915-931.

Underkoffler, J., Ullmer, B., and Ishii, H. (1999). Emancipated Pixels: Real-World Graphics in the Luminous Room. In *Computer Graphics (Proc. of SIGGRAPH'99),* pp. 385-392.

Ullmer, B., Ishii, H., and Glas, D. (1998). mediaBlocks: Physical Containers, Transports, and Controls for Online Media. In *Computer Graphics (Proc. of SIGGRAPH'98)*, pp. 379-386.

Editorial

Holmquist, L.-E., Schmidt, A., and Ullmer, B., editors (2004, to appears). "Tangible Interfaces in Perspective." Special issue journal of *Personal & Ubiquitous Computing* (Springer journal with ACM digital library archival)

Refereed Conference Papers

Ullmer, B., and Ishii, H. (2003). Tangible Query Interfaces: Physical Constrained Tokens for Manipulating Database Queries. In *Proceedings of INTERACT'03*, pp. 279-286.

Rekimoto, J., Ullmer, B., and Oba, H. (2001). DataTiles: A Modular Platform for Mixed Physical and Graphical Interactions. In *Proceedings of CHI'01,* pp. 269-276.

Ullmer, B., Kim, E., Kilian, A., Gray, S., and Ishii, H. (2001). Strata/ICC: Physical Models as Computational Interfaces. In *Proceedings of CHI'01 Extended Abstracts*, pp. 373-374.

Ullmer, B., and Ishii, H. (1999). mediaBlocks: Tangible Interfaces for Online Media. In *Proceedings of CHI'99 Extended Abstracts (video demonstration)*, pp. 31-32.

Wisneski, C., Ishii, H., Dahley, A., Gorbet, M., Brave, S., Ullmer, B. and Yarin, P. (1998). Ambient Displays: Turning Architectual Space into an Interface between People and Digital Information. In *Proceedings of CoBuild'98*, pp. 22-32.

Ullmer, B., and Ishii, H. (1997). The metaDESK: Models and Prototypes for Tangible User Interfaces. In *Proceedings of UIST'97*, pp. 223-232.

Ishii, H., and Ullmer, B. (1997). Tangible Bits: Towards Seamless Interfaces between People, Bits, and Atoms. In *Proceedings of CHI'97*, pp. 234-241.

Gallery installation

NTT InterCommunications Center; Tokyo, Japan, Summer 2000
Strata/ICC: an interactive installation within the "Tangible Bits" exhibition

Patents *(all as co-inventor)*

Methods and systems for providing human/computer interfaces (US 6076734, US 6164541)
Filed October 1997, first issued June 2000; work at Interval Research
Content: invisible (IR&UV) hyperlinking & browing of paper documents and other physical media

Browser for use in navigating a body of information, with particular application to browsing information represented by audiovisual data (US 6263507)
Filed December 1996, issued July 2001; work at Interval Research
Content: technologies for automatic cross correlation & browsing of electronic media spanning multiple media types (e.g., news in text, audio, and video formats)

Display pause with elastic playback (US 6005564, US 6259441)
Filed December 1996, first issued October 1998; work at Interval Research
Content: technologies underlying "time shift" function found in many modern DVRs (e.g., TiVo)

TEACHING + INVITED TALKS

Courses:

Troisième Cycle Romand d'Informatique (March 2004)
Spring School of the 3rd Cycle in Computer Science of Swiss Universities
One of four invited two-day tutorials on "Multimodal and Mobile Interfaces"
Topic: "Tangible Interfaces"

Hong Kong Polytechnic University, School of Design (November 2002)
Five-week invited projects course for undergraduate design students
"Giving Physical Form to Digital Information"

MIT Media Laboratory (1996-2001)
"Tangible Interfaces:" teaching assistant, 1996-99 (w/ Prof. Hiroshi Ishii)
"Issues in Tangible Interfaces:" teaching assistant, 1999 (w/ Prof. Hiroshi Ishii)
"How to Make (Almost) Anything:" teaching assistant (laser cutting & mini-mills), 1999-2001 (w/ Profs. Neil Gershenfeld, Joseph Jacobson, and Joseph Paradiso)

University of Illinois, Urbana-Champaign, Campus Honors Program (1992)
"Resources of the Internet" (two short courses)

Invited talks:

Technical University/Eindhoven, Depts. of Industrial Design & Technology Management, May 2004:
Colloquium series on "New Visions on Interaction Design"
"Giving Form to the Formless: Digital Artifacts for Tangible Interaction with Online Information"

IBM Zürich Research Labs, November 2003:
"Tangible- and Web-based Tools for Facilitating Interactive 3D Visualization"

Louisiana State University, Center for Computing and Technology, October 2003:
"Tangible Interfaces for Computational Science"

Max Planck Institute for Gravitational Physics, February 2003 (Potsdam, Germany):
"Giving Physical Form to Digital Information"

Hong Kong Polytechnic University, School of Design, December 2002:
"Giving Physical Form to Digital Information"

IBM Zürich Research Labs, May 2002:
"Tangible User Interfaces for Abstract Digital Information"

SAP Research (Waldorf, Germany), May 2002:
"Tangible User Interfaces for Abstract Digital Information"

Fraunhofer IPSI, May 2002 (Darmstatd, Germany):
"Tangible User Interfaces for Abstract Digital Information"

Frauenhofer FIT, May 2002 (Sankt Augustin, Germany):
"Tangible User Interfaces for Abstract Digital Information"

University of Maryland, Human-Computer Interaction Lab, November 2001:
"Tangible User Interfaces for Abstract Digital Information"

IBM, Design and Information Development division, April 2001 (RTP, North Carolina):
"Tangible User Interfaces: Giving Physical Form to Digital Information"

Governor's School for Science and Mathematics, April 1999 (Hartsville, South Carolina):
"Beyond the TV Typewriter: Tangible Interfaces for Computational Media"

IMPACT'99, March 1999 (Gothenburg, Sweden):
"Beyond the TV Typewriter: Tangible Interfaces for Computational Media"

Governor's School for Science and Mathematics, November 1992 (Hartsville, South Carolina):
"Resources of the Internet"

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