Xiaojun Bi

Contact Information

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Immigration Status: Permanent Resident of Canada

Research Interest

My research lies in Human-Computer Interaction (HCI), with primary interests in human behavior understanding, performance modeling, and interactive system design. In particular, my current research focuses on improving user's experience in both existing interactive systems (e.g., desktop, mobile computing, interactive tabletops, and pen-based tablets), and emerging computing environments (e.g., large high-resolution displays, brain computer interaction). Additional research interests include CSCW, Interactive Graphics, Information Visualization, and Ubiquitous Computing.

Education

Ph.D. Dept. of Computer Science, University of Toronto, Sept.2006~June 2011
Thesis Title:
"Processing Desktop Work on a Large High-Resolution Display: Studies and Designs"
Advisor: **Prof. Ravin Balakrishnan (Canada Research Chair)**

M.Sc. Dept. of Computer Science, Tsinghua University, Sept.2003~Aug. 2006
Thesis Title: *"uPen: Interaction on Large Displays with Augmented Laser Pointers"*

B.Sc. Dept. of Automation (Control Theory and Engineering), Tsinghua University, Sept. 1999~Aug. 2003

Work Experiences

Research Intern Feb 2011 ~ June 2011
Google Research Mountain View, U.S.A.
Project: Gesture-Based Input on Mobile Devices
Mentors: Yang Li and Shumin Zhai

Research Intern June 2010 ~ Sep 2010
Adaptive Systems and Interaction Group
Microsoft Research-- Redmond Redmond, U.S.A.
Project: Pen and Touch E-Reader for Active Reading.
Mentor: Ken Hinckley

Research Intern Oct 2009 ~ March 2010
User Interface Research Group
Autodesk Research Toronto, Canada
Project: Bringing Multi-Touch Surfaces into Desktop Work: Studies and Designs.
Mentors: Tovi Grossman and George Fitzmaurice

Part-Time Consulting Researcher Oct 2008 ~ Jan 2010
ShapeWriter Inc. U.S.A.
Project: Modeling Gesture Recognition Accuracy and Designing/Evaluating Soft Keyboard Layouts for ShapeWriting Techniques.
Mentor: Shumin Zhai

Research Intern June 2008 ~ Sep 2008
User Science & Experience Research Group
IBM Almaden Research Center San Jose, U.S.A.
Project: Soft Keyboard Layouts Optimization for Multilingual Input
Mentors: Shumin Zhai and Barton A. Smith.

Publications (Peer-reviewed)

Xiaojun Bi, Barton A. Smith, Shumin Zhai. (2011) "Multilingual Touchscreen Keyboard Design and Optimization". To appear in *Human-Computer Interaction* (*HCI* Journal), 34 pages. [Impact Factor: 6.190]

Xiaojun Bi, Tovi Grossman, Justin Matejka, George Fitzmaurice. (2011) "Magic Desk: Bringing Multi-Touch Surfaces into Desktop Work". *Proceedings of CHI 2011 – the ACM Conference on Human Factors in Computing System.* p2511~p2520. [Acceptance Rate: 26%; **Best Paper Nominee – Top 5%**]

Yizhong Xin, **Xiaojun Bi,** Xiangshi Ren. (2011) "Acquiring and Pointing: An Empirical Study of Pen Tilt-Based Interaction" *Proceedings of CHI 2011 – the ACM Conference on Human Factors in Computing System.* p849~p858. [Acceptance Rate: 26%]

Xiaojun Bi, Seok-Hyung Bae, Ravin Balakrishnan. (2010) "Effects of Interior Bezels of Tiled-Monitor Large Displays on Visual Search, Tunnel Steering, and Target Selection", *Proceedings of CHI 2010 – the ACM Conference on Human Factors in Computing System.* p65~p74. [Acceptance Rate: 22%]

Xiaojun Bi, Barton A. Smith, Shumin Zhai (2010) "Quasi-Qwerty Soft Keyboard Optimization", *Proceedings of CHI 2010 – the ACM Conference on Human Factors in Computing System.* p283~p286. [Acceptance Rate: 22%]

James Scott, Shahram Izadi, Leila Sadat Rezai, Dominika Ruszkowski, **Xiaojun Bi,** Ravin Balakrishnan, (2010)"RearType: Text Entry Using Keys on the Back of a Device", *ACM MobileHCI 2010.* p171~p180. [Acceptance Rate: 23%]

Xiaojun Bi, Ravin Balakrishnan. (2009) "Comparing Usage of a Large High-Resolution Display to Single or Dual Desktop Displays for Daily Work" *Proceedings of CHI 2009 – the ACM Conference on Human Factors in Computing Systems.* p1005~p1014. [Acceptance Rate: 25%]

Xiaojun Bi, Tomer Moscovich, Gonzalo Ramos, Ravin Balakrishnan, Ken Hinckley (2008) "An Exploration of Pen Rolling for Pen-based Interaction", *Proceedings of UIST 2008 - The ACM Symposium on User Interface Software and Technology.* p191~p200. [Acceptance Rate: 18%]

Xiaojun Bi, Yuanchun Shi, Xiaojie Chen. (2006)"uPen: A Smart Pen-liked Device for Facilitating Interaction on Large Displays", *Proceedings of IEEE TableTop Conference on Horizontal Interactive Human-Computer Systems 2006.* p160~p168.

Xiaojun Bi, Yuanchun Shi, Xiaojie Chen. (2005) "uPen: Laser-based, Personalized, Multi-User Interaction on Large Displays", *Proceeding of ACM Multimedia 2005*. [Acceptance Rate: 16%]

Xiaojun Bi, Yuanchun Shi, Xiaojie Chen. (2005) "Facilitating Interaction with Large Displays in Smart Spaces", *Proceedings of the 2005 Joint Conference on Smart Objects and Ambient Intelligence*. (sOc-EUSAI 2005), vol. 121 p105~p110.

Paper in Submission or Preparation.

Xiaojun Bi, Seok-Hyung Bae, Ravin Balakrishnan. "Manage Overflowing Windows on a Large Display: Studies and Designs". Submitted to *Human-Computer Interaction* (*HCI* Journal), 48 pages.

Ken Hinckley, **Xiaojun Bi,** Michel Pahud. Bill Buxton. "An Informal Slate of Affairs". Submitted to *UIST 2011*.

Xiaojun Bi, Seok-Hyung Bae, Ravin Balakrishnan. "Effects of Display Size and Pixel Density on Desktop Work". In preparation for *ACM Transactions on Human Computer Interaction*, 20 pages.

Patents Filed

Xiaojun Bi, Barton Smith, Shumin Zhai. "Method for Optimization of Soft Keyboard for Multiple Languages". U.S. patent filed April 2010. Pending.

Xiaojun Bi, Yuanshun Shi. "A Wireless Remote Controller for Computers." Patent in China. Number: 200510011538.3

Implemented Interactive Systems

Magic Desk

I designed and implemented a desktop prototype, called Magic Desk. It explored the design space of multi-touch-integrated desktop experience.
Implementation Platform: C# on Microsoft Surface
Video Demo URL: http://www.dgp.toronto.edu/~xiaojun/MagicDesk/

WallTop

I designed and implemented a large-display oriented window management prototype, called WallTop. It coherently integrated a set of new interaction techniques with traditional window operations to provide greater flexibility in managing windows on a large display. These new techniques included facile methods for selecting, moving, resizing and rearranging multiple windows, and freely adjusting their z-orders.
Implementation Platform: C++ and OpenGL
Video Demo URL: http://www.dgp.toronto.edu/~xiaojun/WallTop/

Pen+Touch E-Reader

I designed and implemented an interactive system to support active reading on a touch screen device. Users can freely browse, collect, aggregate and share content during

reading using a digital pen and finger touches. This system offered users a freeform and organic reading experience.

Implementation Platform: C# on Wacom Touch Screen FS5

Video Demo URL: http://www.dgp.toronto.edu/~xiaojun/EReader/

Services

Program Committee Member

APSIPA Annual Summit and Conference Interaction and Interface Track (2010)

Associate Chair

APCHI Asia Pacific Human Computer Interaction (2012)

Journal Paper Reviewer

International Journal of Industrial Ergonomics,

IEICE Transactions on Information and Systems,

IEEE Computer Graphics and Applications,

Behavior and Information Technology,

International Journal of Human Computer Studies.

Conference Paper Reviewer

CHI(2007~2011), UIST(2007~2011), Ubicomp(2009), HPG(2009)

Teaching Experience (TA)

CSC318	The Design of Interactive Computational Media (2006 Fall)
CSC148	Introduction to Computer Science (2007 Winter, 2008 Winter, 2009 Winter)
CSC180	Introduction to Computer Programming (2007 Fall, 2008 Fall, 2010 Fall)
CSC108	Introduction to Computer Programming (2010 Fall)

Honors and Awards

Ontario Graduate Scholarships in Science and Technology, (OGSST)	2009~2010
Wolfond Fellowship, University of Toronto,	2006~2007
Academic Scholarships for Seven Successive Years, Tsinghua Univ.	1999~2006

The First Place in *National Mathematic Contest (China,1999)* in Local Province (Top 1 among 250, 000 Students), Recruited by Tsinghua University with *National Entrance Examination* Waived.

References

Dr. Ravin Balakrishnan (PhD Supervisor)

Associate Professor & Canada Research Chair

Department of Computer Science, University of Toronto

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Dr. Shumin Zhai

Research Scientist, Google Research

(Former Research Staff Member at IBM Almaden Research Center)

Editor-in-Chief of ACM Transactions on *Human Computer Interaction*

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Dr. Khai N. Truong
Assistant Professor
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Dr. Ken Hinckley
Principal Researcher, Microsoft Research—Redmond
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