Gabe Johnson

Computational Design
Carnegie Mellon University

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Education

Ph.D., Carnegie Mellon University (Ongoing, Expected Graduation: 2011)
Computational Design

B.S., University of Colorado, Boulder (2002)
Computer Science

Research Interests

Design; Human-Computer Interaction (HCI); Software Engineering; Open Source Software (OSS); Sketch-Recognition User Interfaces (SkRUIs); Computer Supported Cooperative Work (CSCW); Information Visualization; Machine Learning

Research Projects

Calligraphic interaction techniques for sketch-based design environments: Thesis work on techniques for interacting with sketch recognition-based design environments. (Current work)

Design Tools for SDR Networks: Building tools to support designers of software-defined radio and Cognitive Radio. Part of *Ravenshield* project at Stevens Technical Institute. (September 2009 to September 2010)

Sketching games: Internet-based games for collecting information on how people make and describe hand-made sketches using 'human computation' techniques. (December 2008 to September 2009)

FlatCAD: Design system for algorithmic generation of form with domain-specific programming language *FlatLang* for output of physical models using rapid prototyping machinery. (September 2006 to May 2008)

Flow Selection: Time-based, modeless interaction technique for pen-based selection and operation. (October 2005 to May 2006)

Designosaur: Sketch-based interface for designing creatures for output to rapid prototyping device such as a laser cutter or 3D printer. (August 2005 to 2006)

Professional Experience

Research Programmer — September 2009 to present
Stevens Technical Institute — Hoboken, NJ
Studied technical and social aspects of software-defined radio (SDR) and Cognitive Radio in order to build tools supporting designers of SDR networks.

Software Engineering Intern — Summer 2008
Google — Boulder, CO
Developed search feature in Google 3D Warehouse to make it easier for designers to find appropriate models for their work. Also built support for this in Google SketchUp 7.

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Graduate Research Assistant 2005-2008
Carnegie Mellon University, Computational Pittsburgh, PA
Design Lab (codelab)
Worked on projects related to computationally enhanced construction kits and crafts, including the *Designosaur* and *FlatCAD/FlatLang*.

Research Internship Summer 2006
Ricoh Innovations, Inc. Menlo Park, CA
Applied Flow Selection and sketch interaction to an experimental electronic document pad.

Software Engineer 2002-2005
ReadyTalk Denver, CO
Developed commercial web and audio conferencing system primarily using Java.

Undergraduate Research Assistant 1998-2002
University of Colorado Boulder, CO
Center for LifeLong Learning and Design, Computer Science Department. Assisted graduate students and faculty on various HCI projects.

Software Engineering Intern Summer 2001
humanIT AG Sankt Augustin, Germany
Ported commercial information visualization system (InfoZoom) to mobile devices.

Research Engineer Summer 2000
University of Colorado Boulder, CO
Department of Applied Mathematics. Led development of the Mathematical Discussion System, a system for embedding conversations about math in online mathematics texts.

Guest Teacher Fall 2001-Spring 2002
New Vista High School Boulder, CO
Taught high school students how to program in various languages (Java, Python, HTML).

Publications

Johnson, G. and E. Y.-L. Do. (2009) *Games for sketch data collection.* In C. Grimm and J. J. L. Jr., editors, EUROGRAPHICS Symposium on Sketch-Based Interfaces and Modeling (SBIM 2009), 2009.

Johnson, G., M.D. Gross, J.I. Hong, E. Y-L. Do. (2009) *Computational Support For Sketching in Design: A Review.* Foundations and Trends in Human-Computer Interaction. (2)1, p1–93.

Johnson, G. *Picturephone: A game for sketch data capture.* In IUI '09 Workshop on Sketch Recognition, 2009.

Johnson, G. (2008) *FlatCAD and FlatLang: Kits by Code* IEEE Symposium on Visual Languages and Human-Centric Computing. Herrsching am Ammersee, Germany.

Johnson, G. (2008) *Sketching for the Refinement Stage of Design* IEEE Symposium on Visual Languages and Human-Centric Computing, Workshop on Sketch Tools for Diagramming. Herrsching am Ammersee, Germany.

Johnson, G. (2007). *A Tiny Ethnography of a Professional Design Studio.* CHI 2007 Workshop on Supporting Design Studio Culture in HCI. San Jose, CA.

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Johnson, G. (2006). *Modeless Sketch Interaction Using Flow Select.* CHI 2006 Workshop on Sketching. Montreal, Quebec.

Johnson, G., M.D. Gross, E. Y-L. Do. (2006). *Flow Selection: A Time-Based Selection and Operation Technique for Sketching Tools.* In proc. 8th International Working Conference on Advanced Visual Interfaces (p83-6), ACM Press, Venice, Italy.

Oh, Y., G. Johnson, M.D. Gross, E. Y-L. Do. (2006). *The Designosaur and the Furniture Factory: Simple Software for Fast Fabrication.* Second International Conference on Design Computing and Cognition, Springer, Eindhoven, The Netherlands.

Johnson, G. (2002). *The Mathematical Discussion System.* 2002 Conference on Computer Supported Collaborative Learning, Lawrence Erlbaum, Boulder, CO.

Professional Service

Reviewer, ACM Conference on Tangible, Embedded and Embodied Interaction (TEI 2011)

Reviewer, ACM Conference on Creativity & Cognition (C&C 2009)

Reviewer, ACM Symposium on User Interface Software and Technology (UIST 2008, 2009)

Reviewer, Artificial Intelligence for Engineering Design, Analysis and Manufacturing. Special issue on Tangible Interaction for Design. (AIEDAM 2008)

Assistant organizer, Design Research Summer School, Carnegie Mellon University, Summer 2007.

Reviewer, International Conference on Multimodal Interfaces (ICMI 2006)

Reviewer, Conference on Designing for User Experience (DUX 2005)

Reviewer, ACM Conference on Computer Human Interaction, Late-Breaking Papers (CHI 2004)

Student Volunteer Conference Co-chair, Computer Supported Collaborative Learning (CSCL 2002)

Student Volunteer: CHI 2000, CHI 2001, GROUP 2001

Technical Skills

Java, ANTLR, HTML, XML, JSP, SQL, Python, Ruby, Lisp, bash scripting, C/C++, Perl, Linux/Unix, OS X, Emacs, Eclipse, ant, cvs/svn, programming language design

October 12, 2010