

Sean Gustafson

CONTACT INFORMATION

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OBJECTIVE

My objective is to continue my academic career by pursuing a doctoral degree at a respected institution that will provide me with the foundations and opportunities required to become a world-class researcher.

My research interests lie mostly within the field of Human-Computer Interaction. In particular, I am concentrating on formal models of interaction phenomena and novel interaction techniques for small screen mobile devices.

EDUCATION

Master of Science – Computer Science

University of Manitoba (*Winnipeg, Manitoba, Canada*)

Sept. 2006 – Dec. 2008 (expected)

Advisor: Dr. Pourang Irani Grade: 4.50 (0 = fail, 4.50 = perfect)

Thesis: Visualizing Off-Screen Locations on Small Mobile Displays

Bachelor of Science with Distinction – Computer Science

University of Manitoba (*Winnipeg, Manitoba, Canada*)

Sept. 1998 – May 2004

Minor in Psychology. Part-time.

Overall Grade: 3.51; Second Half Grade: 4.08

EMPLOYMENT HISTORY

Independent Consultant

Consultant: Aug. 2003 – Present

Consulted in areas of medical devices, QNX software, web software, and network administration.

University of Manitoba (Winnipeg, Manitoba, Canada)

Marker / Teaching Assistant: Sept. 2006 – Apr. 2008

Assistant and marker for third and fourth year undergraduate Human-Computer Interaction courses (COMP3020 and COMP4020).

Advanced Medical Optics Inc. (Santa Ana, California, USA)

Contract Software Engineer: Feb. 2005 – Sept. 2006

Medical device software development.

ClearOption Technologies Inc. (Winnipeg, Manitoba, Canada)

Software Developer / System Administrator: Nov. 2003 – Feb. 2005

Web software development and Linux/BSD/Solaris server administration.

Astra Network Inc. (Winnipeg, Manitoba, Canada)

Senior QNX Analyst: Aug 2000 – Jun 2003

Developed embedded software for various third parties in the consumer electronics, telecommunication and medical device industries.

Astra Network Inc. (Winnipeg, Manitoba, Canada)

Web Software Developer / Networking Consultant: May 1998 – Aug 2000

Created Perl-based web software and consulted on network design and installation for local businesses.

Astra Network Inc. (Winnipeg, Manitoba, Canada)

System Administrator: Jan 1998 – Jun 2003

Maintained the company's collection of desktop PCs and servers.

Astra Network Inc. (Winnipeg, Manitoba, Canada)

Phone Support: May 1996 – Jan 1998

Phone technical support for a small Internet service provider.

SELECTED RESEARCH PROJECTS

Visualization of Off-Screen Targets

University of Manitoba. Graduate Student Researcher. Sept. 2006 – Present.

When a map is displayed on a handheld device, it is rarely possible to view a wide enough region to see all points of interest (e.g., all 5-star restaurants downtown) and at the same time having enough close detail to properly navigate using the map. To address this problem, I am investigating a class of map visualization techniques that indicate the presence and location of off-screen points of interest, so users can see close-up detail and nearby (but off-screen) targets.

My Contribution: I designed two new off-screen visualization techniques called EdgeRadar and Wedge and experimentally determined their usefulness.

Alternative Input Methods

University of Manitoba. Graduate Student Researcher. June 2007 – Present.

I am part of a research team investigating alternative methods of input for software systems. Specifically we have looked at pressure-based input hardware and accelerometer-based gesture and tilt interactions.

My Contribution: Helped design and run experiments. I contributed background research, writing, editing, and video creation.

SELECTED INDUSTRIAL PROJECTS

Phacoemulsification Surgical Device

Advanced Medical Optics. Full-time Contract. Feb. 2005 – Sept. 2006.

I worked on a surgical instrument for cataract eye surgery. The instrument has four basic functions: phacoemulsification (lens pulverization with ultrasound), aspiration (removal of fluid and particles from eye), irrigation (replacement of lost eye fluid), and cauterization (sealing of incisions with electric current). The instrument consists of a large body that houses all electronics and most mechanical components, a hand piece that is placed into the eye by the surgeon, and foot pedal that the surgeon uses to control various surgical operations. The instrument is configured via a large touch screen panel on mounted on the body.

My Contribution: I developed the low-level control software of the instrument. The software was written in C++ for the QNX Realtime OS and was I responsible for coordinating the realtime execution of all hardware and for high-level communication with the GUI module (running Window XP Embedded on a separate processor). I worked directly with the electrical and mechanical engineers as well as the user-interface software developers.

Hotel Room Internet Terminal

iCit America. Part-time Contract. 2002 – 2007.

The iCit Telecenter is a small computer terminal with a built-in phone, keyboard, and touch screen display. It was designed for use in a hotel room, replacing the standard phone. Hotel guest may use it as a phone, read about hotel services and sponsored services, and use the device to browse the Internet.

My Contribution: I helped develop the software and runtime environment for the device. After the launch, I created maintenance fixes as required.

Pneumonia Kinetic Therapy System

Kinetic Concepts. Contract. 2002 – 2004.

The device is a therapeutic bed for unconscious pneumonia patients. The patient is strapped into the bed and the system rotates the patient back and forth in either the supine (face up) or prone (face down) orientation. An on-board computer with touch screen user interface controls the therapy session and records the patient's vital stats.

My Contribution: I was part of a small team of developers to produce the full software system for the on-board computer. I wrote code for all parts of the systems, including a driver for the RS485-based communication bus and an XML-based user interface system.

Aircraft Navigation System for Crop Sprayers

WAG Corp. Contract. 1999 – 2000

This project was a GPS-based map terminal built into the cockpit of small aircraft for spraying agricultural crops with chemicals. The device recorded the areas of the field that was sprayed and directed the pilot to unsprayed regions to reduce waste from overlapping sprays.

My Contribution: I developed the touch screen driver, tested the instrument and fixed software defects.

PUBLICATIONS

Mahfuz Rahman, **Sean Gustafson**, Pourang Irani and Sriram Subramanian. 2009. Tilt Techniques: Investigating the Dexterity of Wrist-based Input. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '09)*, 10 pages, to appear. (acceptance rate: 24.5%)

Sean Gustafson, Patrick Baudisch, Carl Gutwin and Pourang Irani. 2008. Wedge: Clutter-Free Visualization of Off-Screen Locations. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '08)*, 787-796. (acceptance rate: 22%)

Kang Shi, Pourang Irani, **Sean Gustafson** and Sriram Subramanian. 2008. PressureFish: A Method to Improve Control of Discrete Pressure-based Input. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '08)*, 1295-1298. (acceptance rate: 22%)

Bowen Hui, **Sean Gustafson**, Pourang Irani and Craig Boutilier. 2008. The Need for an Interaction Cost Model in Adaptive Interfaces. In *Proceedings of the Working Conference on Advanced Visual Interfaces (AVI '08)*, 458-461. (acceptance rate: 27.5%)

Sean Gustafson and Pourang Irani. 2007. Comparing Visualizations for Tracking Off-Screen Moving Targets. In *Extended Abstracts on Human Factors in Computing Systems (CHI '07)*. 2399-2404. (acceptance rate: 18%)

ACADEMIC AWARDS

Michael S. Doyle Graduate Fellowship (institutional)
Sept. 2007 – Apr. 2008; *University of Manitoba (M.Sc.)*
\$900

Manitoba Graduate Scholarship (provincial)
May 2007 – Apr. 2008; *University of Manitoba (M.Sc.)*
\$15,000

University of Manitoba Faculty of Science Studentship (institutional)
Sept. 2006 – Aug. 2008; *University of Manitoba (M.Sc.)*
\$10,000; Awarded for two years, declined second year

NSERC Undergraduate Student Research Award in Industry (national)
Sept. 2004 – Jan. 2005; *University of Manitoba (B.Sc.) while in Industry at Clearton Technologies*
\$4500

University of Manitoba Entrance Scholarship (institutional)
Sept. 1998 – Apr. 1999; *University of Manitoba (B.Sc.)*
\$700

ACADEMIC SERVICE

IEEE 3DUI 2009 Conference – paper reviewer
ACM CHI 2009 Conference – student volunteer
ACM CHI 2009 Conference – paper reviewer
ACM CHI 2008 Conference – student volunteer
GI 2008 Conference – paper reviewer

TECHNICAL SKILLS

Software Development:

- Excellent knowledge of C, C++, C#, VB, Java, Flash, ActionScript, PHP, Perl, .NET, .NET Compact, XML, UML, Makefiles, and shell scripting.
- Experienced in Windows (most, including Mobile and XP Embedded), QNX, Linux, BSD, Solaris, and Irix.
- Designing user interfaces based on established research.
- Creating low-level device drivers for complex hardware.
- Creating software for mission critical and resource-limited platforms.
- Developing web driven applications.

Software Management:

- Leading software development projects.
- Maintaining the build process and revision control system of a project.
- Writing technical documentation and manuals using LaTeX, DocBook, and Word.

PROFESSIONAL MEMBERSHIP

ACM, SIGCHI, IEEE, Computer Society

OTHER INTERESTS

The business of software, golf, motorcycles, travel, photography, hiking, canoeing, backcountry camping, fishing, and solving the world's problems at the pub.