

Aaron Robert Gember

CONTACT INFORMATION

Department of Computer Science
1210 W. Dayton Street
Madison, WI 53705

Email: agember@cs.wisc.edu
Phone: (414) 550-5820
Website: <http://gemberdesign.com>

EDUCATION

Ph.D. Candidate in Computer Science

University of Wisconsin–Madison Madison, WI *GPA:* 4.0/4.0 August 2009 - Present

Bachelor of Science in Computer Science

Marquette University Milwaukee, WI *GPA:* 3.96/4.0 May 2009

RESEARCH

Mobile Device Offloading

Offloading allows arbitrary mobile applications to be executed on an idle workstation or the cloud to save energy on the mobile device or provide additional computation resources. Using an OpenFlow network, offloading decisions are made by the central controller with runtime knowledge from mobile devices and workstations.

Embedded Xinu

Embedded Xinu is an embedded operating system designed for use in educational and research settings, running on Linksys wireless routers. Research accomplishments include:

- Collaborated on implementation of a network stack including Address Resolution Protocol, Internet Protocol, User Datagram Protocol, and Transmission Control Protocol (TCP).
- Extended the TCP implementation to provide soft real-time constraints and data delivery guarantees necessary for streaming media.
- Implemented revisions to the TTY driver to provide asynchronous input and output that parallels modern console I/O paradigms.
- Developed a shell and commands for user interaction.
- Implemented mailboxes as an alternative method of interprocess communication.
- Discovered methodology for controlling LEDs on the hardware.
- Contributed changes for Xinu release 1.0, 1.5, and 2.0.

PAPERS

- Ashok Anand, Aaron Gember, Vyas Sekar and Aditya Akella. “Tracking Semantic Relationships for Effective Content Management in Home Networks”, *ACM SIGCOMM HomeNets Workshop 2010*, New Delhi, India, August 2010.

POSTERS

- Aaron Gember and Dennis Brylow. “Real-Time TCP for Embedded Devices”, *ACM Student Research Competition Poster Session, ACM Technical Symposium in Computer Science Education*, Chattanooga, TN, March 2009.

PRESENTATIONS

- Aaron Gember and Dennis Brylow. “Real-Time TCP for Embedded Devices”, *Marquette University Annual Forward Thinking Poster Session and Colloquy*, Milwaukee, WI, December 2008.

HONORS AND SCHOLARSHIPS

- University of Wisconsin—Madison Department of Computer Science Summer Graduate Fellowship (2010)
- Third Place in the ACM Student Research Competition at SIGCSE 2009
- Helen Way Klingler College of Arts and Sciences Superior Academic Achievement Award (2006, 2007, 2008, 2009)
- Marquette University Dean’s List (2005 – 2009)

PROFESSIONAL AND HONORARY SOCIETY MEMBERSHIPS

- Association for Computing Machinery
- Upsilon Pi Epsilon – Computer Science Honor Society
- Pi Mu Epsilon – National Mathematics Honor Society
- Phi Beta Kappa
- Alpha Sigma Nu – Honor Society of Jesuit Colleges and Universities

EMPLOYMENT

Research Assistant

Department of Computer Science, Univ. of Wisconsin–Madison January 2010 – present
Performing research under the advising of Dr. Aditya Akella.

Teaching Assistant

Department of Computer Science, Univ. of Wisconsin–Madison August 2009 – December 2009
Assisted students and graded coursework for CS 536, Introduction to Compilers. Co-facilitated two lab sections for CS 302, Introduction to Programming.

Research Assistant

Math, Stats., and Comp. Sci., Marquette University May 2007 – August 2009
Performed research with Embedded Xinu, an embedded operating system designed for wireless routers, under the advising of Dr. Dennis Brylow.

Student Technical Support Specialist Manager

IT Services, Marquette University January 2008 – August 2009
Supervised a group of seven Student Technical Support Specialists (STSS) to ensure the resolution of desktop support incidents and changes for faculty and administrators. Trained and provided guidance for STSSs on standard support practices and university supported technologies. Facilitated and completed special workstation deployment and software development projects.

EXTRACURRICULARS

- *TGIF Co-Coordinator*, ACM student chapter, UW–Madison, (2009 – 2010)
- *Participant* in the ACM International Collegiate Programming Contest (2007, 2008)
- *President*, Linux Users Group, Marquette University (2007 – 2009)
- *Vice President*, ACM student chapter, Marquette University (2008 – 2009)

MAJOR COURSE PROJECTS

Virtual Machine Monitor for Embedded Devices

Built an embedded virtual machine monitor (VMM) for the Linksys WRT54GL wireless router. Adding a VMM to OpenWrt—a version of Linux designed for small network routers—provides benefits of security, mobility, and hardware consolidation. Embedded Xinu is run as the guest operating system in a VMM which supports bootstrapping, exception and interrupt handling, and a virtual serial device.

Electronic Medical Record System

Developed a software-based solution to replace the paper-based record system at a non-profit Saturday healthcare clinic. The project team focused on a well designed web-based user interface designed for remote accessibility and straightforward interaction. Implemented a database backend and HIPAA compliant security features based on customer needs and target specifications.

Membership Management Database Application

Replaced the existing spreadsheet based membership management system for a local non-profit organization with a database solution. Focused on establishing important data relationships to allow for easy and informational ad-hoc reporting. Developed a thick client frontend using C#.Net to interface with the MySQL database backend. Designed the system to allow for anticipated future expansion.