Lena E. Olson

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Education

Expected Summer 2016   **Ph.D. (Computer Sciences)**, *University of Wisconsin*, Madison, WI.
Have completed coursework for distributed PhD minor in Electrical and Computer Engineering and Interdisciplinary Engineering.
Thesis: *Protecting Host Systems from Imperfect Hardware Accelerators*.

2011   **M.S. (Computer Sciences)**, *University of Wisconsin*, Madison, WI.
Graduate coursework in Architecture, Multicore Programming, Operating Systems, Distributed Systems, Real-Time Systems, and Natural Language Processing.

2009   **B.S. (Computer Sciences, Scandinavian Studies)**, *UW-Madison*, Madison, WI.

Publications

Lena E. Olson, Jason Power, Mark D. Hill, David A. Wood. *Border Control: Sandboxing Accelerators*. MICRO-48, December 2015.

Lena E. Olson, Simha Sethumadhavan, Mark D. Hill. *Security Implications of Third-Party Accelerators*. Computer Architecture Letters, Accepted June 2015.

Lena E. Olson, Mark D. Hill. *Probabilistic Directed Writebacks for Exclusive Caches*. UW Technical Report CS-TR-2016-1831, February 2016.

Lena E. Olson, Yasuko Eckert, Srilatha Manne, Mark D. Hill. *Revisiting Stack Caches for Energy Efficiency*. UW Technical Report CS-TR-2014-1813, December 2014.

Patents

Yasuko Eckert, **Lena E. Olson**, Srilatha Manne, James M. O'Connor. *Using predictions for store-to-load forwarding.* US 9367455.

Lena E. Olson, Yasuko Eckert, Vilas K. Sridharan, James M. O'Connor, Mark D. Hill, Srilatha Manne. *Methods and apparatus for soft-partitioning of a data cache for stack data*. US 9298615.

Lena E. Olson, Yasuko Eckert, Bradford M. Beckmann. *Stack cache management and coherence techniques.* US 9189399.

Lena E. Olson, Yasuko Eckert, Srilatha Manne. *Specialized memory disambiguation mechanisms for different memory read access types.* US 20150067305 (application).

Lena E. Olson, Yasuko Eckert, Vilas K. Sridharan, James M. O'Connor, Mark D. Hill, Srilatha Manne. *Methods and apparatus for data cache way prediction based on classification as stack data.* US 20140143499 (application).

Lena E. Olson, Yasuko Eckert, Vilas K. Sridharan, James M. O'Connor, Mark D. Hill, Srilatha Manne. *Methods and apparatus for filtering stack data within a cache memory hierarchy.* US 20140143498 (application).

Research Experience

5/11 - Present   **Research Assistant**, *University of Wisconsin*, Madison, WI.
Work in the Multifacet Group, advised by Dr. Mark D. Hill. Currently investigating the security and reliability implications of 3rd-party accelerator hardware, with emphasis on coherent, shared-memory accelerators. Previously worked on several techniques to improve memory system energy efficiency by distinguishing between different classes of data. Use the gem5 simulator and ruby/slicc for cache coherence protocols.

8/09 - 8/10   **Research Assistant**, *University of Wisconsin*, Madison, WI.
Worked with Dr. Susan Horwitz on producing valid C code from the backwards program slice from a line of source code, and the feasibility of using this technique to debug programs with memory errors.

5/08 - 8/08   **Undergraduate Researcher**, *Texas A&M University*, College Station, TX.
Worked in the Parasol Lab under Dr. Nancy Amato. Implemented an algorithm for distributed multiplication for the Standard Template Adaptive Parallel Library (STAPL).

Professional Experience

5/12 - 8/12   **Summer Research Co-op**, *AMD*, Bellevue, WA.
Researched classification of memory accesses based on locality and store-load behavior and ways to optimize for energy based on these classifications. Investigated possible optimizations in address translation, multiple smaller caches, write-through for reliability, way prediction and partitioning, and store-to-load forwarding and memory dependency prediction.

9/08 - 6/10   **Space Science Engineering Center Datacenter Assistant**, *UW-Madison*.
Performed tasks related to system administration and automation in systems for collecting real-time satellite data. Was student lead on a project to convert the tape-based archive of old data into an online, searchable form.

Teaching Experience

9/14 - 12/14   **Student Assistant Lecturer**, *University of Wisconsin-Madison*, Madison, WI.
Planned, taught, and graded a service-learning course about teaching computer science to 4th and 5th grade students.

1/11 - 5/11   **Teaching Assistant**, *University of Wisconsin-Madison*, Madison, WI.
Graded course projects and held office hours for the undergraduate operating systems.

9/10-12/10   **Teaching Assistant**, *University of Wisconsin-Madison*, Madison, WI.
Graded homeworks for the graduate computer architecture course. Held labs and consulting hours and graded projects and exams for the introductory programming course.

Awards

The Underhanded C Contest 2014 Honorable Mention

Department Service Thank-You, UW-Madison Computer Sciences, 2016

Service

Grandparents University

7/14   **Instructor for Computer Science Major**, Madison, WI.
Taught Scratch and assorted computer science concepts to children and grandparents.

Madison Elementary Scratch Club

2/12-3/12;   **Scratch Club Volunteer**, Madison, WI.
9/13-12/13;   Volunteered with an after-school club for 4th and 5th graders to teach them the basics of
2/14-5/14   programming in Scratch and elementary computer science concepts.

Wisconsin Science Festival

10/12; 10/13;   **Session Organizer and Presenter**, Madison, WI.
10/14   Planned and organized an outreach event to teach Scratch programming to families as
part of the Wisconsin Science Festival. In 2014 also teaching binary.

Scratch Workshop at Jack Russell Memorial Library

6/13; 6/14   **Session Organizer and Presenter**, Hartford, WI.
Organized and let an introduction to Scratch as part of a library summer activity series.

Expanding Your Horizons

11/08; 11/10;   **Volunteer, Presenter, Session Planner**, Madison, WI.
11/11; 11/12;   Planned and presented computer science sessions to middle school girls at a day-long
11/13, 11/14   conference.

Student Groups

University of Wisconsin Student ACM-W Chapter (WACM), Madison, WI

9/14 - 8/15   **President**.
Helped coordinate other officers and organize activities to encourage girls and women to
persue computer science, as well as supporting the women already in the department.

10/12 - 9/14   **Vice President**.
Organized activites to create community for women students, as well as professional and
technical development events for all students.

10/11 - 10/12   Mentoring Program Co-Chair

2010 - 2015   Mentor, WACM Mentoring Program