

# Andrew H. Hunter

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CONTACT INFORMATION	651 NW 51st Street Seattle, WA, 98107 (last updated April 2011)	ahh@cs.washington.edu (413)-570-0499
OBJECTIVE	Employment in computer science or mathematics, particularly opportunities involving parallel & distributed systems, scientific computing, or programming languages.	
RESEARCH INTERESTS	Compilers, runtime systems, garbage collection, parallelism, transactional memory, combinatorial scientific computing, numerical linear algebra, graph algorithms, complexity theory	
EDUCATION	<b>University of Washington</b> , Seattle, WA <b>M.S.</b> in Computer Science (expected May 2011). 3.9 GPA. <b>Classes:</b> Programming Languages, Machine Learning, Statistical Methods, Computer Systems, Quantum Computing, Randomized Algorithms <b>M.S.</b> in Applied Mathematics (expected May 2011). 3.9 GPA. <b>Classes:</b> Applied Analysis, Numerical Analysis of BVPs, Numerical Analysis of Time Dependent Problems, Advanced Methods for ODEs, Advanced Methods for PDEs <b>Harvey Mudd College</b> , Claremont, CA <b>B.S.</b> (with honors), Computer Science & Mathematics (May 2009). 3.5 GPA.	
HONORS AND AWARDS	CRA Outstanding Undergraduate Award Nominee, Harvey Mudd College (2008) Rojansky Science Writing Prize (2008) Mudd Scholar National Merit Scholar Dean's List (Spring 2007-Spring 2009)	
PUBLICATIONS	Jacob Nelson, Brandon Myers, A.H. Hunter, Luis Ceze, Dan Grossman, Mark Oskin, Carl Ebeling, Simon Kahan, and Preston Briggs, "Crunching Large Graphs with Commodity Processors." HotPar '11, USENIX Workshop on Hot Topics in Parallelism. A.H. Hunter and Nicholas Pippenger, "Local versus global search in channel graphs." <i>Networks</i> . (in submission)	
RESEARCH PROJECTS	<b>SoftXMT</b> <i>Professor Simon Kahan</i> Evaluating commodity multicore replacements of Cray XMT custom architecture for large irregular graph computations. Currently optimizing fast green threads for exploiting parallelism in memory controller, establishing benchmarks for achievable bandwidth on irregular accesses.	UW CSE & PNNL <b>Fall 2010 – ongoing</b>
	<b>Senior Thesis</b> <i>Professor Nicholas Pippenger</i> Investigated the path search problem in channel graphs, a formalism of (efficiently) finding usable communication channels in networks. Examined effect of changing allowed search techniques on required complexity. Proved upper & lower bounds on complexity of search in certain families. Extended complexity-theoretic lower bounds on computation of search complexity.	HMC Math Department <b>Fall 2008 – Spring 2009</b>
	<b>Bandwidth Minimization</b> <i>Professor Tzu-yi Chen</i> Investigated problem of bandwidth minimization in unsymmetric sparse linear systems. Replicated and tested known algorithms. Adapted techniques from other sparse graph problems, and analyzed their efficacy.	Pomona CS Department <b>Fall 2008 – Spring 2009</b>
	<b>Marshall</b> <i>Professor Chris Stone</i> Examined the Marshall language for exact real arithmetic and theorem proving. Ported OCaml implementation to Haskell. Analyzed extant algorithms and techniques. Developed embedded DSL for Haskell version. Explored Haskell parallelism techniques for proof tree exploration.	HMC CS Department <b>Fall 2008 – Spring 2009</b>
	<b>Haskell Age Profiler</b> <i>Professor Melissa O'Neill</i>	HMC CS Department <b>Summer 2008</b>

Developed lightweight system for analyzing behavior of heap data of different ages in Haskell programs. Collected data on standard Haskell benchmarks. Tested hypothesized heap behavior.

### **Transactional Memory**

*Professor Chris Stone*

HMC CS Department

**Spring 2008**

Examined state of the art in programming languages techniques for concurrency control. Extensively studied history, implementation, limitations, and current research in software transactional memory. Designed system for profiling obtained concurrency in transactional Haskell.

### **Emu**

*Professor Robert Keller*

HMC CS Department

**Spring 2007 – Spring 2008**

Designed and developed research compiler for purely functional Scheme to van Dalen/Kleene's formalization of the partial recursive function. Independent project extending from classwork in computability. Extended standard compiler techniques to new domains, using adapted theoretical constructions. Gave talk on work at HMC Presentation Days.

## EXPERIENCE

### **Google**

*Software Engineering Intern*

Cluster Management

**Summer 2009, Summer 2010**

Worked under Walfredo Cirne, analyzing tools for increasing cluster reliability. Designed, built, tested, and used a system for reconstructing cluster workload from operating logs & re-executing workload on simulated cluster with different scheduling algorithms. Evaluated efficacy of proposed techniques for improving reliability. Fulfilled feature requests, fixed bugs, and wrote tests for various cluster risk tools.

### **Pacific Northwest National Lab**

*Research Assistant*

HPC Group

**Spring 2010**

Investigated possible improvements in performance of multigrid algorithms on GPUs with CUDA. Developed performance models based on streaming computation and roofline models.

### **Discrete Structures**

*Teaching Assistant*

UW CSE Department

**Winter 2010**

Assisted Prof. Dan Suciu with undergraduate course on discrete mathematics & logic. Taught weekly recitation, graded homeworks, wrote exams, ran review sessions, held office hours.

### **Software Engineering Group**

*Research Assistant*

UW CSE Department

**Fall 2009**

Working on PhD research under Prof. Michael Ernst. Examined transactional memory's potential for practical speedup on irregular graph problems from combinatorial scientific computing.

### **Computer Science REU**

*Garbage Collection Research Fellow*

HMC CS Department

**Summer 2008**

Examined various techniques and systems in the garbage collection literature. Designed, developed, tested, and analyzed new technique for profiling (see **Haskell Age Profiler**, above.) Gave invited talk on transactional programming and concurrency control. Assisted in creation and analysis of a new graph algorithm. Presented work to other REU researchers.

### **Computer Science Grutor**

*Tutor/Grader*

HMC CS Department

**Spring 2008 – present**

Held office hours, graded homework, ran review sessions for undergraduate CS courses.

- Computability & Logic
- Operating Systems

### **The Aerospace Corporation**

*Undergraduate Technical Support*

Information Assurance Technology Dept.

**Summer 2006**

Designed, developed, and tested administrative interface as part of the Adaptive Security Infrastructure research project. Gave real-time demonstration of ASI system under Emulab network simulation. Gave talk on the Metasploit Exploit Framework. Maintained lab of 10-20 Debian systems; investigated administration tools for Windows/Linux login integration.

## TECHNOLOGIES

**Languages:** C, C++, Scheme, Haskell, SML, Python, Ruby, Java, assembly, Prolog, Mathematica  
**Tools:** L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>, Emulab, revision control, build tools, test frameworks