Jacob Nelson

Computer Science and Engineering
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EMPLOYMENT

- **Computer Science and Engineering, University of Washington**, Seattle, WA.
  Postdoctoral Research Associate, January 2015–present.
  Research Assistant, September 2006–December 2014.
- **Cray**, Seattle, WA.
  Contractor, September 2015–present.
  Porting proprietary distributed graph database to run on Grappa for portability, enabling new product.
  Intern, Summer 2009.
  Runtime work for the Chapel programming language, enabling the use of profiling and tracing tools.
- **Konyac**, Seattle, WA.
  Co-founder, January 2013–January 2014.
  Startup exploring commercial applications of Grappa. Led to open-source effort at `grappa.io`.
- **Google**, Mountain View, CA., Seattle, WA.
  Intern, Summer 2010, October 2010–September 2011 (part time).
  Analyzed performance of new customer-facing virtualization infrastructure.
  Intern, Summer 2007, Summer 2008.
  Designed and built FPGA-based accelerator hardware.
- **Amazon**, Seattle, WA.
  Software Development Engineer, 2005–2006.
  Implemented new supply chain optimization algorithms, reducing cost to ship orders. Some web frontend work.
- **XKL**, Redmond, WA.
  Member Technical Staff, Hardware, 2001–2004.
  FPGA and PCB design for control processors of high-end networking hardware (large core Internet roters; dense wavelength-division multiplexers). Spearheaded new processor design, enabling new product line that is still being sold. Led systems and network administration team.
- **Pacific Northwest National Laboratory**, Richland, WA.
  Intern, Summer 1999.

EDUCATION

- **University of Washington**, Seattle, WA.
  Ph.D. in Computer Science, December 2014.
  Thesis: *Latency-Tolerant Distributed Shared Memory For Data-Intensive Applications.*
  M.S. in Computer Science, June 2009.
- **Pacific Lutheran University**, Tacoma, WA.
  B.S. in Computer Engineering and Math, May 2000.

AWARDS AND HONORS

- ◇ 2015 USENIX ATC Best Paper Award
- ◇ Paper from MICRO 2013 invited for fast-track inclusion in ACM TOCS
- ◇ 2011 HPC Advisory Council University Award
- ◇ 2008 Bob Bandes Memorial Award for Excellence in Teaching

SELECTED PUBLICATIONS

1. Jacob Nelson, Brandon Holt, Brandon Myers, Preston Briggs, Luis Ceze, Simon Kahan, Mark Oskin. Latency-Tolerant Software Distributed Shared Memory. *USENIX Annual Technical Conference*, July 2015. Best Paper award.
2. Golnoosh Farnadi, Zeinab Mahdavifar, Ivan Keller, Jacob Nelson, Ankur Teredesai, Marie-Francine Moens, Martine De Cock. Scalable Adaptive Label Propagation in Grappa. Special Session on Intelligent Mining, *IEEE Big Data 2015*, October 2015.
3. Rob Van der Wijngaart, Srinivas Sridharan, Abdullah Kayi, Gabriele Jost, Jeff R. Hammond, Timothy G. Mattson, Jacob Nelson. Using the Parallel Research Kernels to Study PGAS Runtimes. *International Conference on PGAS Programming Models (PGAS)*, September 2015.
4. Vincent T. Lee, Jacob Nelson, Mark Oskin, Luis Ceze. A 10G NetFPGA Prototype for In-Network Aggregation. *Workshop on Architectural Research Prototyping (WARP w/ISCA)*, June 2015.
5. Thierry Moreau, Mark Wyse, Jacob Nelson, Adrian Sampson, Hadi Esmaeilzadeh, Luis Ceze, Mark Oskin. SNNAP: Approximate Computing on Programmable SoCs via Neural Acceleration. *International Symposium on High-Performance Computer Architecture (HPCA)*, February 2015.
6. Brandon Myers, Dan Halperin, Jacob Nelson, Mark Oskin, and Bill Howe. Radish: Compiling Efficient Query Plans for Distributed Shared Memory. UW CSE Tech Report 14-10-01, 2014.
7. Jacob Nelson, Brandon Holt, Brandon Myers, Preston Briggs, Luis Ceze, Simon Kahan, Mark Oskin. Grappa: A Latency-Tolerant Runtime for Large-Scale Irregular Applications. *International Workshop on Rack-Scale Computing (WRSC w/EuroSys)*, April 2014.
8. Adrian Sampson, Jacob Nelson, Karin Strauss, Luis Ceze. Approximate Storage in Solid-State Memories. *International Symposium on Microarchitecture (MICRO)*, December 2013. Selected to appear as an expanded version in ACM TOCS.
9. Brandon Holt, Jacob Nelson, Brandon Myers, Preston Briggs, Luis Ceze, Simon Kahan, Mark Oskin. Flat Combining Synchronized Global Data Structures. *International Conference on PGAS Programming Models (PGAS)*, October 2013.
10. Jacob Nelson, Brandon Holt, Brandon Myers, Preston Briggs, Luis Ceze, Simon Kahan, Mark Oskin. Pomace: A Grappa for Non-Volatile Memory. *Non-Volatile Memories Workshop*, March 2013.
11. Jacob Nelson, Brandon Myers, A. H. Hunter, Preston Briggs, Luis Ceze, Carl Ebeling, Dan Grossman, Simon Kahan, Mark Oskin. Crunching Large Graphs With Commodity Processors. *USENIX Hot Topics in Parallelism (HotPar)*, June 2011.
12. Jacob Nelson, Adrian Sampson, and Luis Ceze. Dense Approximate Storage in Phase-Change Memory. Ideas and Perspectives session, *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, March 2011.
13. Joseph Devietti, Jacob Nelson, Tom Bergan, Luis Ceze, Dan Grossman. RCDC: A Relaxed Consistency Deterministic Computer. *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, March 2011.
14. Jacob Nelson, Luis Ceze. Dynamic Concurrency Discovery for Very Large Windows of Execution. *Workshop on Parallel Execution of Sequential Programs on Multi-core Architectures (PESPMA w/ ISCA)*, June 2009.

PATENTS

- Luis Ceze, Tom Bergan, Joseph Devietti, Dan Grossman, Jacob Nelson. Systems and Methods for Providing Deterministic Execution. US9146746, issued September 2015.

TEACHING

- Fall 2015, Invited lecture in CSEP548: Computer Architecture
- Spring 2015, Invited lecture in CSE471: Computer Design and Organization
- Spring 2014, Invited lecture in CSE471: Computer Design and Organization
- Spring 2013, Invited lecture in CSE471: Computer Design and Organization
- Spring 2010, TA for CSE378: Machine Organization and Assembly Language, CSE, UW.
- Fall 2009, TA for CSE378: Machine Organization and Assembly Language, CSE, UW.
- Winter 2009, TA for CSE378: Machine Organization and Assembly Language, CSE, UW.
- Fall 2008, TA for CSE378: Machine Organization and Assembly Language, CSE, UW.
- Spring 2008, TA for CSE378: Machine Organization and Assembly Language, CSE, UW.
- Winter 2008, TA for CSE378: Machine Organization and Assembly Language, CSE, UW.
- Fall 2007, TA for CSE467: Advanced Logic Design, CSE, UW.
- Spring 2007, TA for CSE471: Computer Design and Organization, CSE, UW.
- Winter 2007, TA for CSE567: Principles of Digital Systems Design, CSE, UW.
- Fall 2006, TA for CSE467: Advanced Logic Design, CSE, UW.
- Spring 2006, CSCE480: Microprocessors, co-taught with Professor Tosh Kakar, Pacific Lutheran University.

SERVICE

- External review committee member for IEEE CAL 2015, POPL 2015, HPCA 2013, PLDI 2012.
- Reviewer for ACM Computing Surveys, 2015.
- Reviewer for IEEE Computer Special Issue on Irregular Applications, 2015.
- Reviewer for Journal of Parallel and Distributed Computing Special Issue on Architectures and Algorithms for Irregular Applications, 2014.
- Program committee member, Workshop on Irregular Applications: Architectures and Algorithms, 2012 and 2015.
- Pacific Lutheran University Computer Science and Engineering Industrial Advisory Board member, 2006–present.
- Member of ACM, IEEE, USENIX.

FUNDING

- December 2015, $10K credit, Amazon Web Services. PI: Jacob Nelson, *Tolerating latency in the cloud with Grappa*.
- March 2015, $25K cash and $36K hardware, Intel. PI: Jacob Nelson, *Parallel Programming with Intel Phi*.

STUDENTS

- ◇ Supervised undergraduate student research with John Abercrombie (June 2015–present), Zach Simon (January 2015–present), Cindy Xin Yi (June 2014–June 2015), Bran Hagger (March 2014–March 2015), Teddy Brow (September 2014–December 2014), Jake Sanders (September 2013–January 2014), Clara Moore (June 2012–June 2013)
- ◇ Master's committee member for Zeinab Mahdavifar at UW Tacoma

STATUS

US Citizen.