

# Robert Searles

## Education

- 2012–2018 **Ph.D. Computer and Information Science, *University of Delaware, Newark, DE.***  
(est) Research topics include high-level languages targeting accelerators, auto-tuning of compiler optimizations, machine learning, and distributed graph analytics on large sets of data. Dissertation work focused on creating portable programming language extensions for complex parallel patterns targeting HPC systems.
- 2016 **M.S. Computer Science, *University of Delaware, Newark, DE.***
- 2008–2012 **B.S. Computer Science, *University of Delaware, Newark, DE.***

## Experience

- 2015 **Co-Op Engineer, *Advanced Micro Device (AMD), Sunnyvale, CA.***  
Member of the external research area at the Sunnyvale facility. Implemented a template library providing high-level programming abstraction for an emerging processing-in-memory architecture.
- 2011–Present **Research Assistant, *University of Delaware, Newark, DE.***  
Position under Dr. Sunita Chandrasekaran. Conducted research on multiple topics, including:
- Auto-tuning high level languages targeted at GPU codes (including financial applications ported to the GPU)
  - Optimizing GPU performance using OpenACC
  - Leveraging heterogeneous systems to perform program characterization by analyzing graph-based representations of applications
  - Large-scale graph analysis on distributed systems
  - Creating a high-level abstraction for parallel wavefront algorithms
- 2010, **Teaching Assistant, *University of Delaware, Newark, DE.***
- 2015-2017 Monitor lab sessions and proctor exams. Fill in for lectures when needed. Responsible for grading labs and exams and holding office hours for students who need extra help.
- Fall 2010: CISC 106 – Introductory Computer Science for Engineers (J. Cavazos)
  - Fall 2015: CISC 471/672 – Compiler Design (L. Pollock)
  - Spring 2016: CISC 275 – Introduction to Software Engineering (T. Harvey)
  - Fall 2016: CISC 471/672 – Compiler Design (L. Pollock)
  - Spring 2017: CISC 275 – Introduction to Software Engineering (T. Harvey)

## Open-Source GPU Projects

**PolyBench/ACC**  
[cavazos-lab.github.io/PolyBench-ACC](http://cavazos-lab.github.io/PolyBench-ACC)  
Scientific kernels targeting accelerators

**FinanceBench**  
[cavazos-lab.github.io/FinanceBench](http://cavazos-lab.github.io/FinanceBench)  
Financial benchmarks targeting accelerators

## Publications

- [1] [CONFERENCE] **R. Searles**, S. Chandrasekaran, W. Joubert, and O. Hernandez, “Abstractions and Directives for Adapting Wavefront Algorithms to Future Architectures,” at *The Platform for Advanced Scientific Computing (PASC 2018)*.  
DOI: 10.1145/3218176.3218228
- [2] [CONFERENCE] M. Ghane, S. Chandrasekaran, **R. Searles**, M. Cheung, and O. Hernandez, “Path Forward for Softwarization to Tackle Evolving Hardware,” at *Disruptive Technologies in Information Sciences 2018 (Proc. SPIE 10652)*.  
DOI: 10.1117/12.2304813
- [3] [JOURNAL] **R. Searles**, S. Herbein, T. Johnston, M. Taufer, and S. Chandrasekaran, “Creating a Portable, High-Level Graph Analytics Paradigm For Compute and Data-Intensive Applications,” at *International Journal of High Performance Computing and Networking (IJHPCN 2017 Vol. 10)*.

- [4] [CONFERENCE] [R. Searles](#), L. Xu, W. Killian, T. Vanderbruggen, T. Forren, J. Howe, Z. Pearson, C. Shannon, J. Simmons, and J. Cavazos, "Parallelization of Machine Learning Applied to Call Graphs of Binaries for Malware Detection," at *25th Euromicro International Conference on Parallel, Distributed and Network-Based Processing*, PDP 2017, St. Petersburg, Russia, 2017.
- [5] [WORKSHOP] [R. Searles](#), S. Herbein, and S. Chandrasekaran, "A Portable, High-Level Graph Analytics Framework Targeting Distributed, Heterogeneous Systems," at *WACCPD16: Third Workshop on Accelerator Programming Using Directives (WACCPD '16)*. IEEE Press, Piscataway, NJ, USA, 79-88.
- [6] [WORKSHOP] S. Grauer-Gray, W. Killian, [R. Searles](#), and J. Cavazos, "Accelerating Financial Applications on the GPU," in *Proceedings of the 6th Workshop on General Purpose Processor Using Graphics Processing Units, GPGPU-6*, (New York, NY, USA), pp. 127–136, ACM, 2013.
- [7] [CONFERENCE] S. Grauer-Gray, [R. Searles](#), L. Xu, S. Ayalasomayajula, and J. Cavazos, "Auto-tuning a High-Level Language Targeted to GPU Codes," at *INPAR: Innovative Parallel Computing*, INPAR 2014, San Jose, CA, USA, 2012.

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## Professional Services

- 2017 [Mentor](#), *GPU Hackathon - NASA Langley*, Hampton, VA.
- 2017 [Mentor](#), *GPU Hackathon - Brookhaven National Laboratory*, Upton, NY.
- 2016 [Mentor](#), *3-Day OpenACC GPU Hands-on Programming Workshop at University of Delaware*, Newark, DE.
- 2016 [GPU Hackathon Participant](#), *5-Day GPU Programming Hackathon at University of Delaware*, Newark, DE.

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## Volunteerism

- 2017 [Student Volunteer Lead](#), *SuperComputing 2017*, Denver, CO.
- 2016 [Student Volunteer](#), *SuperComputing 2016*, Salt Lake City, UT.
- 2015 [Student Volunteer](#), *SuperComputing 2015*, Austin, TX.
- 2014 [Student Volunteer](#), *SuperComputing 2014*, New Orleans, LA.
- 2009–2012 [Vice-President](#), *Association of Computing Machinery @ UD*, Newark, DE.
- 2009–2012 [Webmaster](#), *Linux Users Group @ UD*, Newark, DE.