

Louis Jenkins

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EDUCATION

BLOOMSBURG UNIVERSITY OF PENNSYLVANIA, Bloomsburg, PA

Summer 2012 - Fall 2017

- **Degree:** Bachelor of Science (B.S.) in Computer Science
- **Scholarship:** Board of Governors

Fall 2013 - Spring 2017

UNIVERSITY OF ROCHESTER, Rochester, NY

Fall 2018 –

- **Degree:** PhD Candidate in Computer Science
- **Advisor:** Michael Scott
- **Fellowships:**
 - Provost Fellowship
 - Department of Energy Computational Science Graduate Fellowship

Fall 2018 - Spring 2019

Fall 2019 –

RESEARCH EXPERIENCE

STUDENT RESEARCHER, Lehigh University, Bethlehem, PA

Summer 2016

- **Project:** Concurrent and Scalable Built-in Hash Table for the Go Programming Language [1]
- **Advisor:** Michael F. Spear
- **Grant:** National Science Foundation
- **Awards:**
 - Peer's Choice for Outstanding Project.
 - Honorable Mention for CRA 2017 Outstanding Undergraduate Researchers, sponsored by Microsoft Research.
- **Summary:**
 - Designed and implemented a novel scalable lock-based concurrent map for Go's runtime and compiler.
 - Implemented with compatibility for Go map syntax; supports insert/lookup/remove and concurrent iteration.
 - Outperforms sequential map by up to 7x across diverse microbenchmarks, competitive against lock-free maps.

GOOGLE SUMMER OF CODE (STUDENT)

Summer 2017

- **Project:** Distributed Data Structures [2]
- **Mentors:** Engin Kayraklioglu, Michael Ferguson
- **Sponsor:** Google Summer of Code
- **Summary:**
 - Designed and implemented the first scalable ordered data structure for PGAS languages ($\approx 100x$ @ 3072 Processors).
 - Designed and implemented a novel scalable unordered data structure ($\approx 500x$ @ 3072 Processors).
 - Designed the Collections modules; all officially available as of Chapel version 1.16

STUDENT RESEARCHER, Bloomsburg University, Bloomsburg, PA

Fall 2017

- **Project:** Introducing LLVM to the Java Virtual Machine
- **Advisor:** William Calhoun
- **Grant:** Professional Experience Grant
- **Summary:**
 - Implemented a prototype frontend to convert JVM Classfiles to LLVM Modules.
 - Explored the possibility of utilizing LLVM as backend and optimizer for JIT Compiler.
 - Designed and implemented proof-of-concept capable of running simple Java programs.

WORK EXPERIENCE

PACIFIC NORTHWEST NATIONAL LABORATORY

- **Position:**
 - Technical Intern IV
 - PhD Intern (Part Time)
 - PhD Intern (Full Time)
 - Non-Employee Volunteer
- **Awards:** Outstanding Performance Award
- **Project:** Chapel HyperGraph Library (CHGL) [3,4,5]
 - Lead developer of distributed global-view hypergraph library, written in Chapel [3]
 - Creator of multiple libraries and abstractions for irregular patterns such as aggregation [4]
 - Exploration of modeling DNS data and relations as hypergraphs in collaboration with HyperNetX (HNX) [5]

Summer 2018

Fall 2018 - Spring 2019

Summer 2019

Fall 2019 –

MENTORING EXPERIENCE

RAILS GIRLS SUMMER OF CODE (COACH),

Summer 2018

- **Project:** Distributed Sorting Algorithms in Chapel
- **Mentees:** Rupal and Avneet
- **Summary:**
 - Provided assistance in design, implementation, and in profiling bottlenecks.
 - Brought some significant performance issues in the language to light.
 - End result served as bootstrap for further distributed radix sort for the Chapel language.

GOOGLE SUMMER OF CODE (MENTOR)

Summer 2019

- **Project:** Concurrent-Safe Memory Reclamation System
- **Mentee:** Garvit Dewan
- **Summary:**
 - Co-designed and assisted in implementation of epoch-based reclamation in shared- and distributed-memory.
 - Epoch-Based Manager scaled in distributed memory on Cray-XC; tested up to 64 nodes
 - Contributed Lock Free Queue & Stack, Scalable Distributed Atomics, and Epoch-Based Manager.

PUBLICATIONS

- [1] L. Jenkins, T. Zhou, and M. Spear, “Redesigning Go’s Built-In Map to Support Concurrent Operations,” in 2017 26th International Conference on Parallel Architectures and Compilation Techniques (PACT), 2017, pp. 14–26.
- [2] L. Jenkins, “RCUArray: An RCU-Like Parallel-Safe Distributed Resizable Array,” in 2018 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW), 2018, pp. 925–933.
- [3] L. Jenkins et al., “Chapel HyperGraph Library (CHGL),” 2018 IEEE High Performance extreme Computing Conference (HPEC), pp. 1–6, 2018.
- [4] L. Jenkins, M. Zalewski, and M. Ferguson, “Chapel Aggregation Library (CAL),” in 2018 IEEE/ACM Parallel Applications Workshop, Alternatives To MPI (PAW-ATM), 2018, pp. 34–43.
- [5] C. Joslyn, L. Jenkins, and M. Zalewski, “High Performance Hypergraph Analytics of Domain Name System Relationships,” 2019.