Skyler Ruiter

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Education

Indiana University Bloomington (IUB) — Bloomington, IN
Ph.D. in Information Systems Engineering — Aug 2024–Current

- Track: Computer Engineering
- Minor: Computer Science
- Related Coursework:
  - High Performance Computing
  - Distributed Systems
  - Graph Analytics

Grand Valley State University (GVSU) — Allendale, MI
B.S. in Computer Science, GPA: 3.97/4.00 — Aug 2020–Apr 2024

- Minor: Mathematics
- Related Coursework:
  - Theory of Computation
  - Numerical Analysis
  - Linear Algebra II
  - Algorithms Engineering
  - Scientific Computing - *Independent Study*

Research Experiences

Graduate Research Assistant — Indiana University
Advisor: Dr. Fengguang Song

Error-Bound Lossy Compression for Scientific Data (FZ) — Aug 2024–Current

- Profiled the cuSZ lossy compressor as well as related compressors, tested kernel implementations, and modeled performance of compressor kernels across Nvidia GPUs.
- Porting kernels to Kokkos and optimizing GPU performance across architectures.

Summer Undergraduate Research Internship — Sandia National Labs
Advisor: Dr. Oksana Guba

Optimizing the E3SM Climate Model — May 2024–Aug 2024

- HPC internship at a Department of Energy National Lab. Achieved through a Sustainable Horizons Institute workshop.
- Worked towards understanding redundant solves in the world class E3SM climate model, helping maximize its potential for exascale applications.

Undergraduate Researcher — Applied Computing Institute (GVSU)
Advisors: Dr. Zachary DeBruine & Dr. Erin Carrier

IVSparse - Sparse Data Compression Library — Aug 2022–May 2024

- Created two proprietary compression formats which leverage present redundancy in data to allow for usable compressed data with a limited performance loss.
- Involved work in high performance computing (HPC), data compression, and data structure design.

Probabilistic Modeling of Genomics Data with Variational Autoencoders — Sep 2023–Jan 2024

- Aims to train a variational autoencoder on genetic data to help predict patient risk based on genetic factors.

Publications

- [**BigData '24**] Seth Wolfgang, **Skyler Ruiter**, Marc Tunnell, Timothy Triche Jr, Erin Carrier, Zachary DeBruine. "Value-Compressed Sparse Column (VCSC): Sparse Matrix Storage for Single-cell Omics Data." *2024 IEEE International Conference on Big Data (BigData)*. Washington D.C., December 15-18.

Extracurricular Activities

GVSU Computing Club President Spring 2021–Spring 2024

- Worked to bring up a new generation of club leadership before graduation.
- Networked with companies, brought in many professors and researchers, and ran events and meetings regularly.
- Mentored numerous other undergraduate students, helping achieve internships, begin research positions, and plan their educational and career goals.

Dean's Student Advisory Council Spring 2022–Spring 2024

- Advised the dean of the Padnos College of Engineering and Computing with a small collection of other students from different disciplines.

International Collegiate Programming Contest Spring & Fall 2023

- Volunteered during contest preparations and competed in event.

Scholarships and Awards

- Luddy Doctoral AI Fellowship — Fall 2024
- Science Undergraduate Laboratory Internships (SULI) Award — Summer 2024
- P. Douglas Kindschi Undergraduate Research Fellowship — Spring 2024

Skills

- HPC
- Scientific Computing
- OpenMP/MPI
- Kokkos

Languages

- C/C++ — Experienced
- Python — Experienced
- CUDA — Intermediate
- Fortran — Intermediate

Presentations

- (IVSparse) IEEE BigData HPC-BOD Workshop Presentation — Fall 2024
- (IVSparse) IEEE Data Compression Conference Technical Presentation — Spring 2024
- (IVSparse) GVSU School of Computing Seminar Series — Spring 2024
- (IVSparse/Genomic Modeling) GVSU Undergraduate Research Fair — Fall 2023
- (IVSparse) Grand Rapids Tech Week: Engineering and Computing Showcase — Fall 2023
- (IVSparse) Grand Valley State University Student Scholar's Day — Spring 2023