

Mike Pozulp

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Lawrence Livermore National Laboratory
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Personal Information

Citizenship: U.S.

Interests

Numerical Methods, Computer Architecture, Compilers

Education

University of California, Berkeley	Berkeley, CA	Expected May 2025
PhD in Applied Science & Technology		
GPA: 3.89/4.00		

The College of William & Mary	Williamsburg, VA	May 2015
Bachelor of Science, <i>magna cum laude</i>		
Major: Computer Science		
Minor: Economics		
GPA: 3.75/4.00		

Presentations and Publications

Lead author indicated by *

- **“An Implicit Monte Carlo Acceleration Scheme”** (with T. Haut, P. Brantley, J. Vujic). In *Proceedings of M&C 2023*. Niagara Falls, Canada. August 2023.*
- **“Progress Porting LLNL Monte Carlo Transport Codes to Nvidia GPUs”** (with R. Bleile, P. Brantley, S. Dawson, M. McKinley, M. O'Brien, A. Robinson, M. Yang). In *Proceedings of M&C 2023*. Niagara Falls, Canada. August 2023.*
- **“Fast Solvers for the Finite Element Method”** (with B. Muldoon). Unpublished. May 2022.
- **“Enhancements supporting IC usage of PEM libraries on next-gen platforms”** (with D. Richards, B. Ryujin). Technical Report LLNL-TR-823775, Lawrence Livermore National Laboratory, Livermore, California. June 2021.
- **“RISC-V Code Generation Comparison”** (with Y. Miyasaka). Unpublished. May 2021.*
- **“Heterogeneity, Hyperparameters, and GPUs: Towards Useful Transport Calculations Using Neural Networks”** (with P. Brantley, T. Palmer, J. Vujic). In *Proceedings of M&C 2021*, 1252-1261. Raleigh, North Carolina. October 2021.*
- **“Extending 1D Transport Using Neural Nets to GPUs”** (with P. Brantley). Accepted for presentation at *SNA+MC 2020*. Tokyo, Japan. May 2020.*
- **“Transitioning the Scientific Software Toolchain to Clang/LLVM”** (with S. Dawson, R. Bleile, P. Brantley, M. McKinley, M. O'Brien, D. Richards). Accepted for presentation at *EuroLLVM 2020*. Paris, France. April 2020.*
- **“Status of LLNL Monte Carlo Transport Codes on Sierra GPUs”** (with M. McKinley, R. Bleile, P. Brantley, S. Dawson, M. O'Brien, D. Richards). In *Proceedings of M&C 2019*, 2160-2165. Portland, Oregon. August 2019.
- **“1D Transport Using Neural Nets, SN, and MC.”** In *Proceedings of M&C 2019*, 876-885. Portland, Oregon. August 2019.*
- **“Porting the Opacity Client Library to a CPU-GPU Cluster Using OpenMP4.5”** (with J. Kimko, R. Haque, L. Grinberg). In *Proceedings of SC17*. Denver, Colorado. November 2017.
- **“Introduction to Monte Carlo.”** Presented at *LLNL's Computation Intern Seminar Series*, June, 2017 and *W&M Math Department Colloquium Series*, October, 2017.*
- **“LLNL Monte Carlo Transport Research Efforts for Advanced Computing Architectures”** (with P. Brantley, R. Bleile, S. Dawson, N. Gentile, M. McKinley, M. O'Brien, D. Richards, D. Stevens, J. Walsh, H. Childs). In

- **“Optimizing Application I/O by Leveraging the Storage Hierarchy Using the Scalable Checkpoint Restart Library with a Monte Carlo Particle Transport Application on the Trinity Advanced Computing System”** (with G. Becker, P. Brantley, S. Dawson, K. Mohror, A. Moody, M. O'Brien). In *Proceedings of SC16*. Salt Lake City, Utah. November 2016.*
- **“Creating a Framework for Systematic Benchmarking of High Performance Computing Systems.”** In *Proceedings of SC14*. New Orleans, Louisiana. November 2014.*

SC is the International Conference for High Performance Computing, Networking, Storage, and Analysis.

Lawrence Livermore National Lab	Livermore, CA	July 2015 - Present
Position: Computer Scientist		

- W&M High Performance Computing** Williamsburg, VA February 2012 - May 2015
Position: Undergraduate Assistant to High Performance Computing

- Developed a distributed-memory parallel N-1 and N-N I/O performance benchmark using MPI
- Performed STREAM memory benchmarking, code timing, and cycle counting
- Supported HPC applications with data visualization and performance refactoring
- Assembly/maintenance of diverse CPU + GPU distributed-memory compute clusters, totaling 900+ cores and 21 TFLOP/s theoretical peak performance
- Developed graphical tools for monitoring jobs and node statistics

NASA Langley Research Center Hampton, VA January - August 2014
Position: UAV Engineering Intern

- Developed ground control station that controls UAVs with MAVLink transmissions and collects ADS-B, GPS, and other RF data from UAVs to create a live display of UAVs in the local airspace
- Performed Hardware-In-The-Loop Simulation tests of ground control station using autopilot boards and commercial flight simulator
- Prepared hardware/software systems for multi-rotor and fixed-wing aircraft

NASA Ames Research Center	Moffett Field, CA	May - August 2013
Position: Supercomputing Research Intern		

- Investigated performance scaling in four generations of Intel Xeon processors running the NASA Parallel Benchmarks on top-20 supercomputer Pleiades
- Researched effects of MPI communication traffic across Pleiades interconnect

- C/C++, Python, Java, R, Bash, MPI, OpenMP, CUDA, Git/Github, LLVM, Latex, PyTorch
- Linux. OS X. Windows. Solaris. Android. Web

- LLNL LEARN Research Funding (\$115,434) 2020 January
- W&M Small Hall Makerspace Grant Recipient (\$700) 2014 May
- ACM Student Research Competition Travel Award (\$500) 2014 September
- Virginia Space Grant Consortium Grant Recipient (\$6,750) 2013 June

Honors, Prizes, and Awards

• LLNL Computer Science Spot Award	2023 March
• LLNL Computational Physics Monthly Recognition Award	2021 July
• LLNL Computational Physics Monthly Recognition Award	2020 July
• LLNL Code Development Bronze Star Award	2019 August
• LLNL Computational Physics Monthly Recognition Award	2018 November
• Stanford CS148 Raytracing Project, 2nd Place	2015 December
• NASA Ames Poster Contest, 1st Place	2013 August

Professional Development

• M&C 2023	Niagara Falls, Canada	2023 August 13-17
• M&C 2021	Raleigh, North Carolina	2021 October 3-7
• J34 Applied Computer Science Meeting	Livermore, California	2020 February 24-27
• LLVM Developer Meeting	San Jose, California	2019 October 22-23
• NSSC Fall Workshop	Livermore, California	2019 October 7-9
• M&C 2019	Portland, Oregon	2019 August 25-29
• LLVM Developer Meeting	San Jose, California	2018 October 17-18
• J34 Applied Computer Science Meeting	Albuquerque, New Mexico	2018 February 11-16
• Supercomputing (SC)	Denver, Colorado	2017 November 12-17
• DoE CoE Performance Portability Meeting	Denver, Colorado	2017 August 21-24
• Supercomputing (SC)	Salt Lake City, Utah	2016 November 13-18
• DoE CoE Performance Portability Meeting	Glendale, Arizona	2016 April 18-22
• ATPESC	St. Charles, Illinois	2016 July 31 - August 12
• Supercomputing (SC)	New Orleans, Louisiana	2014 November 16-21
• Supercomputing (SC)	Denver, Colorado	2013 November 17-22

Technical Coursework

University of California, Berkeley

• Finite Elements in Nonlinear Continua (ME 280B)	2022 Spring
• Numerical Linear Algebra (MATH 221)	2022 Spring
• Introduction to the Finite Element Method (ME 280A)	2021 Fall
• Radiation Processes in Astronomy (PHY C207)	2021 Fall
• Graduate Computer Architecture (CS 252A)	2021 Spring
• Numerical Solution of Differential Equations (MATH 228B)	2021 Spring
• Numerical Analysis (MATH 128A)	2020 Fall
• Nuclear Reactor Theory (NE 250)	2020 Fall
• Numerical Simulation in Radiation Transport (NE 255)	2018 Fall

University of California, Davis

• Network Architecture & Resource Management (EEC 273/ECS 258)	2018 Fall
• Quantum Mechanics (PHY 115A)	2017 Spring
• Analytical Mechanics II (PHY 105B)	2017 Winter
• Analytical Mechanics I (PHY 105A)	2016 Fall

University of California, San Diego

• High Energy Density Physics (MAE 207)	2017 Fall
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Stanford University

• Partial Differential Equations in Engineering (CME 204)	2018 Winter
• Compilers (CS 143)	2016 Spring
• Introduction to Computer Graphics (CS 148)	2015 Fall

The College of William & Mary

• Random Walks in Biology (APSC 456)	2015 Spring
• Reliability (CS 668)	2015 Spring
• General Physics II, Honors (PHYS 102H)	2015 Spring
• Analog Electronics (PHYS 252)	2015 Spring
• Ordinary Differential Equations (MATH 302)	2014 Fall

• General Physics I, Honors (PHYS 101H)	2014 Fall
• Digital Electronics (PHYS 351)	2014 Fall
• Finite Automata (CS423)	2013 Fall
• Operating Systems (CS 424)	2013 Fall
• Applied Financial Derivatives (ECON 415)	2013 Fall
• Probability (MATH 401)	2013 Fall
• Numerical Analysis (MATH 413)	2013 Fall
• Programming Languages (CS 312)	2013 Spring
• Systems Programming (CS 415)	2013 Spring
• Econometrics (ECON 308)	2013 Spring
• Multivariable Calculus (MATH 212)	2013 Spring
• Algorithms (CS 303)	2012 Fall
• Computer Organization (CS 304)	2012 Fall
• Intermediate Microeconomics (ECON 303)	2012 Fall
• Software Development (CS 301)	2012 Spring
• Database Systems (CS 321)	2012 Spring
• Intermediate Macroeconomics (ECON 304)	2012 Spring
• Linear Algebra (MATH 211)	2012 Spring
• Data Structures (CS 241)	2012 Fall
• Discrete Structures (CS 243)	2012 Fall