

Neil McGlohon, Ph.D.

CONTACT	neil@mcglo.dev	www.mcglo.dev github.com/nmcglohon
EDUCATION	Ph.D., Computer Science Rensselaer Polytechnic Institute, Troy, New York USA Research Focus: High Performance/Parallel Computing	July 2021
	M.S., Computer Science Rensselaer Polytechnic Institute, Troy, New York USA Research Focus: Distributed Computing, Machine Learning	May 2016
	Bachelor of Science in Physics University of Oklahoma, Norman, Oklahoma USA Minor: Computer Science	May 2014
RELEVANT SKILLS	<ul style="list-style-type: none">• Self-motivated, fast-learner, quick to ramp-up on new topics• Strong and flexible critical-thinking, problem solving, and analysis skills• Comfortable in parallel, distributed, or clustered computing environments	<ul style="list-style-type: none">• Languages and Technologies: C/C++, Python, Java, MPI, Git, Linux, Scripting, MATLAB, SLURM, Jupyter, GDB, Tensorflow/PyTorch, WandB, Docker, AWS, L^AT_EX
FEATURED PROFESSIONAL EXPERIENCE	<ul style="list-style-type: none">• Maintainer of open-source C/C++ repository for massively parallel simulation of high performance computing (HPC) communication networks used by researchers from institutions including Argonne National Laboratory. Rigorously reviews pull requests to ensure stability prior to merging.• Successfully defended dissertation studying the effects of congestion on HPC communication networks and methods of mitigation including adaptive routing, QoS traffic class isolation, and targeted congestion abatement techniques.• Mentored graduate students on their research and academic careers. HPC and networking domain expert resource and mentor for undergraduate and graduate students in projects associated with an NSF funded cyber team program spanning five states.• Published 15 peer-reviewed papers in various conferences and journals in areas of High Performance Computing, Parallel Discrete Event Simulation, Neuromorphic Computing, and Machine Learning. Led many of the associated research projects, orchestrating experiment design, data acquisition and analysis. Presented papers and their findings at conferences internationally. Full list on last page.	
EMPLOYMENT EXPERIENCE	IBM San Jose, California USA Research Scientist	October 2022 - Present Research and Development of optimized code for custom hardware to implement artificial neural network layers and development of debugging tools to assist validation of implemented architectures.
	Rensselaer Polytechnic Institute , Center for Computational Innovations Troy, New York USA Research Scientist	July 2021 - September 2022 Senior personnel of center; performs complex and leading-edge scientific research and development. Main responsibilities include software development for simulation of high performance composable system technologies for facilitation of next-generation AI hardware platforms. External member of the IBM AI Hardware Center.

Spearheads research to compare interconnection network designs and configurations for the facilitation of distributed AI communication workloads through simulation.
 Designs and implements procedures for benchmarking of AI accelerated supercomputing hardware to guide future acquisitions and demonstrate capability of existing systems.
 Triage and prioritizes supercomputing center needs for research facilitation of thousands of users.
 Identifies and pursues research collaboration opportunities with corporate and government partners in coordination with center director.

Software Engineer**February 2020 - July 2021**

Software development and research relating to the field of high performance computing. Worked with external research partners in a collaborative environment to advance the state of the art. Primary maintainer for grant sponsored open-source high performance computing network interconnect simulation framework. Participated as guest lecturer on the topic of the Message Passing Interface (MPI) to Parallel Computing course at RPI.

Cisco Meraki, San Francisco, California USA

Software Engineering Intern**May - August 2017**

Research and development of a thread-safe and lockless read/write HashTable using Read-Copy-Update (RCU) techniques. Submitted to open-source repository for the Software Defined Router: Click. Experience with using JIRA, Gerrit, and associated development tools.

SCIENTIFIC
SERVICE

2020-Present – NSF CAREERS Cyberteam Program

Steering Committee Member

2022 – ACM SIGSIM Principles of Advanced Discrete Simulation (PADS)

Organizing Committee, Ph.D. Colloquium Co-Chair

2022 – ACM SIGPLAN Benchmarking in the Data Center: Expanding to the Cloud (BID)

Program Committee Member

2022 – IEEE IPDPS Workshop on Scalable Deep Learning over Parallel and Distributed Infrastructure (ScaDL)

Program Committee Member

2019-Present – Peer-reviewer for 6 ACM/IEEE computing conferences and journals.

ACADEMIC
EXPERIENCE

Rensselaer Polytechnic Institute, Troy, New York USA

Graduate Research Assistant**August 2014 - July 2021**

M.S. and Ph.D. research, graduate level coursework and projects. Primary area of research: High-Performance/Parallel Computing. Other areas of interest: parallel and distributed systems, cloud computing, machine learning, neuromorphic computing and simulation. Contributor to ROSS parallel discrete event simulation framework.

Teaching Assistant: Computer Science I**August - December 2014**

Support to professor during course teaching fundamentals of computer science using Python. Worked in group of eight teaching assistants. Duties included facilitating two lab discussion sections a week, hosting office hours, grading homework and exams, and monitoring/responding to question on the course online forum.

University of Oklahoma, Norman, Oklahoma USA

Undergraduate Research Assistant**May 2012 - May 2014**

Continued REU research, performing a closer inspection of electrical transport properties of antimony measured at cryogenic temperatures. Worked on developing and refining a method for measuring differential conductance of a material – allowing for a greater understanding of the interface between a topological insulator and a superconductor. Advisor: Dr. Sheena Murphy.

National Science Foundation REU**May - August 2012, 2013**

Participated in condensed matter research and analysis under an NSF Materials Research Science and Engineering Center (MRSEC) grant from advisor: Dr. Sheena Murphy.

- E. Cruz, S. Qian, A. Shulka, **N. McGlohon**, S. Rakheja, C. D. Carothers. *Evaluating Performance of Spintronics-Based Spiking Neural Network Chips using Parallel Discrete Event Simulation*. ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (PADS), Virtual. June 2022, *Accepted*.
- N. McGlohon**, K. S. Hemmert, K. A. Brown, M. Levenhagen, S. Chunduri, R. B. Ross, C. D. Carothers. *Exploration of Congestion Control Techniques on Dragonfly-class HPC Networks Through Simulation*. IEEE SC'21 Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computing Systems (PMBS), Virtual. November 2021.
- J. Ma, J. Goodhue, K. Nelson, A. Sherman, E. Brown, C. D. Carothers, G. Collier, A. Del Maestro, A. Elledge, W. Figurelle, J. Huffman, G. Khanna, **N. McGlohon**, S. Najafi, J. Nucciarone, A. Schwartz, B. Segee, S. Valcourt, R. Zottola. *Leveraging Northeast Cyberteam Successes to Build the CAREERS Cyberteam Program: Initial Lessons Learned*. PEARC Workshop on Strategies for Enhancing HPC Education and Training (SEHET), Virtual. July 2021.
- N. McGlohon**, C. D. Carothers. *Toward Unbiased Deterministic Total Ordering of Parallel Simulations with Simultaneous Events*. ACM SIGSIM Winter Simulation Conference (WSC), Virtual. December 2021.
- K. A. Brown, **N. McGlohon**, S. Chunduri, R. B. Ross, E. Borch, C. D. Carothers, K. Harms. *A Tunable Implementation of Quality-of-Service Classes for HPC Networks*. ISC High Performance (ISC), Virtual. June 2021.
- N. McGlohon**, C. D. Carothers. *Unbiased Deterministic Total Ordering of Parallel Simulations with Simultaneous Events*. ArXiv 2105.00069v1 Pre-print article. May 2021.
- N. McGlohon**, R. B. Ross, C. D. Carothers. *Evaluation of Link Failure Resilience in Multi-Rail Dragonfly-Class Networks*. ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (PADS), Miami, USA. June 2020.
- N. McGlohon**, N. Wolfe, M. Mubarak, C. D. Carothers. *Fit Fly: A Case Study on Interconnect Innovation Through Parallel Simulation*. ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (PADS), Chicago, USA. June 2019.
- Y. Kang, X. Wang, **N. McGlohon**, M. Mubarak, S. Chunduri, Z. Lan. *Modeling and Analysis of Application Interference on Dragonfly+*. ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (PADS), Chicago, USA. June 2019.
- M. Mubarak, **N. McGlohon**, M. Musleh, E. Borch, R. B. Ross, R. Huggahalli, S. Chunduri, S. Parker, C. D. Carothers, K. Kumaran. *Evaluating Quality of Service Traffic Classes on the Megafly Network*. ISC High Performance (ISC), Frankfurt, Germany. June 2019.
- M. Plagge, C. D. Carothers, E. Gonsiorowski, **N. McGlohon**. *NeMo: A Massively Parallel Discrete-Event Simulation Model for Neuromorphic Architectures*. ACM Transactions on Modeling and Computer Simulation (TOMACS). September 2018.
- M. Plagge, **N. McGlohon**, C. Ross, C. D. Carothers. *Simulation and Visualization of Custom Neuromorphic Hardware using NeMo*. Neuromorphic Computing Symposium on Architectures, Models, and Applications, Oak Ridge National Laboratory, USA. July 2017.
- N. McGlohon**, S. Patterson. *Distributed Semi-Stochastic Optimization with Quantization Refinement*. American Control Conference (ACC), Boston, USA. July 2016.
- S. Patterson, **N. McGlohon**, K. Dyagilev. *Optimal k -Leader Selection for Coherence and Convergence Rate in One-Dimensional Networks*. IEEE Transactions on Control of Network Systems (TCNS). January 2016.
- S. Patterson, **N. McGlohon**, K. Dyagilev. *Efficient, Optimal k -Leader Selection for Coherent, One-Dimensional Formations*. European Control Conference (ECC), Linz, Austria. July 2015.