

Neil McGlohon, Ph.D.

ABOUT

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Systems engineer and applied scientist with 6+ years building performance-critical distributed and parallel software, recently leading development and rack-scale deployment of an LLM inference engine and runtime stack for IBM's NorthPole AI accelerator card.

SKILLS AND EXPERTISE

AI/ML: PyTorch, TensorFlow, vLLM, Ray, agentic systems, neuromorphic hardware
Parallel & Distributed Computing: HPC, MPI, NCCL, SLURM, cloud-native architectures
Cloud & Infrastructure: Kubernetes, OpenShift, Helm, Docker, Podman, Grafana, Prometheus, Infiniband & RoCE, NFS, Longhorn, MetalLB, AWS, IBM Cloud
Software Engineering: C/C++, Python, JavaScript/Node.js/Vue.js, GitOps (Git, Jenkins, ArgoCD), CMake, AMQP, S3, REST, SQL, MongoDB, asynchronous event-driven systems

PROFESSIONAL EXPERIENCE

– IBM, IBM Research

Almaden Research Center, San Jose, California USA

Staff Research Scientist

October 2022 – July 2026

- Led design and development of a purpose-built LLM inference engine for the IBM AIU NorthPole AI inference accelerator card, delivering state-of-the-art low latency and energy efficiency.
- Led team of 5 engineers building NorthPole's performance-critical runtime stack.
- Deployed rack-scale distributed AI systems of 288 NorthPole cards, generating over 500,000 tokens per second in aggregate while holding per-token latency as low as 1 millisecond.
- Collaborated with model team to evaluate our quantized and retrained models using tools and benchmarks including EleutherAI's lm-eval and Hugging Face's OpenLLM leaderboards.
- Designed, built, and deployed a cloud-native OpenShift/Kubernetes stack that exposes controlled API access to NorthPole LLM inference appliances and a chat front-end; integrated back-end into IBM watsonx, bringing NorthPole-accelerated inference to workloads across the platform.
- Created NorthPole runtime client/server applications leveraging the YOLOv9 model to perform object detection, identification and tracking on real-time video streams, providing over 300 megapixels per-second of image processing consuming less than 60W of card power.
- Guided broader team as subject-matter expert in parallel and distributed systems, containerization, orchestration, and LLM inference serving including vLLM plugin development and integration.
- Represented NorthPole at business development meetings, client outreach and showcase events, presenting the platform to prospective industry and public-sector partners. Bridged scientific and business-focused teams, driving knowledge transfer and cross-team collaboration.

– Rensselaer Polytechnic Institute, Center for Computational Innovations

Troy, New York USA

Research Scientist

July 2021 – September 2022

- Development and optimization of workloads on the HPC systems for internal and partner research.
- Served on steering committee of an NSF-funded project-of-projects, mentoring participating graduate students as a subject-matter expert in HPC and AI systems.
- External collaborator with IBM AI Hardware Center on research into distributed AI training benchmarking and simulation of composable systems.

Software Engineer

February 2020 – July 2021

- Maintained the open-source Rensselaer Optimistic Simulation System (ROSS) project, a parallel-discrete-event-simulation (PDES) engine capable of providing strong-scaling linear speedup even when distributed across 2-million supercomputer CPU cores.
- Maintained CODES, an open-source framework for massively parallel simulation of HPC communication networks using ROSS, collaborating with researchers at Argonne and Sandia National Laboratories.
- Collaborated with external research partners, writing specifications and architecting bespoke software solutions to capture bleeding-edge experimental results.

- **Cisco Meraki**
San Francisco, California USA
Software Engineering Intern **May – August 2017**
 - Researched and developed firmware for Meraki’s MR platform access points.
 - Designed and built a lockless, thread-safe hashtable using RCU techniques, and upstreamed the contribution to Click, an open-source software-defined router project.

EDUCATION

- Ph.D., Computer Science** **July 2021**
Rensselaer Polytechnic Institute, Troy, New York USA
Research Focus: High Performance/Parallel Computing
- M.S., Computer Science** **May 2016**
Rensselaer Polytechnic Institute, Troy, New York USA
Research Focus: Distributed Computing, Machine Learning
- B.S., Physics** **May 2014**
University of Oklahoma, Norman, Oklahoma USA
Minor: Computer Science

**ACADEMIC
EXPERIENCE**

- **Rensselaer Polytechnic Institute**, Troy, New York USA
Graduate Research Assistant **August 2014 – July 2021**
Ph.D. research, coursework and projects. Areas of focus: high performance and parallel computing, distributed systems, cloud computing, machine learning, neuromorphic computing and simulation.
Teaching Assistant: Computer Science I **August – December 2014**
Supported the instructor of an introductory Python course: led lab sessions and discussions, held office hours, and proctored and graded exams/assignments.
- **University of Oklahoma**, Norman, Oklahoma USA
Undergraduate Research Assistant **May 2012 – May 2014**
Created process to measure differential conductance of cryogenic quantum-confined antimony films.
National Science Foundation REU **May – August 2012, 2013**
Participated in condensed-matter NSF Research Experience for Undergraduates program including first observations of weak anti-localization in cryogenic antimony films.

**SCIENTIFIC
SERVICE**

- NSF CAREERS Cyberteam Program
Steering Committee Member – 2020–2022
- ACM SIGSIM Principles of Advanced Discrete Simulation
Organizing Committee, Publicity Chair – 2023
Organizing Committee, Ph.D. Colloquium Chair – 2022
- Program Committee Memberships
ACM SIGSIM Principles of Advanced Discrete Simulation – 2022–2025
ACM SIGPLAN Benchmarking in the Data Center: Expanding to the Cloud – 2022
IEEE IPDPS Scalable Deep Learning over Parallel and Distributed Infrastructure – 2022

PUBLICATIONS

Author on 18 papers published in conferences and journals spanning AI/ML, neuromorphic computing, high performance computing, and parallel discrete event simulation. Full list at nmcglo.com/cv.