

Nil Tianchen Mu

nil.mu@asu.edu | [linkedin.com/in/nilmu](https://www.linkedin.com/in/nilmu) | github.com/NilaBlueshirt | Tempe, AZ

PROFESSIONAL EXPERIENCE

HPC Systems Administrator

Jan 2024 – Present

Research Computing, Research Technology Office, Arizona State University — Tempe, AZ

- Port bioinformatics LLMs and scientific software to Intel Gaudi2 accelerators and generate accompanying benchmark data.
- Develop benchmarking and post-maintenance testing software for heterogeneous HPC clusters.
- Tune workflow management system performance and scheduling on Slurm-based HPC.
- Refactor genomic sequencing software to modern nf-core standards, contributing to the Earth BioGenome Project.
- Develop a large-scale Nextflow-based virus detection and discovery pipeline with the NASA OSDR Microbiome Analysis Working Group.
- Integrate the HPC account management system with the university registration database for automated account provisioning.
- Customize the Open OnDemand web portal to support scientific applications and agentic AI functionality.
- Manage HPC software stacks and databases; provide real-time troubleshooting for job, software, and hardware issues.

Graduate Research Assistant

Jan 2022 – Dec 2023

ASU Biodesign Institute, Efrem Lim Lab — Tempe, AZ

- Developed an explainable neural network pipeline for microbiome-based classification of COVID-19 patient samples (400 features), using a multilayer perceptron (mean AUC 0.75) with SHAP for feature importance analysis.
- Designed a DBSCAN-based clustering workflow to establish the true-positive threshold for KrakenUniq classification output.
- Contributed to an open-source Python package for model-agnostic feature reduction methods.
- Served on the Arizona Department of Health Services COVID-19 Sequencing Project team; built an ETL pipeline managing sequencing data for over one-third of the Arizona patient population and reporting results to government agencies and hospitals.
- Built a generalizable genomic workflow that identified two novel bat coronaviruses from 250 raw samples on ASU supercomputing resources.

Research Assistant

Jun 2021 – Jan 2022

ASU School of Sustainable Engineering and the Built Environment — Tempe, AZ

- Connected twelve analog and digital environmental sensors to Arduino Uno and Raspberry Pi platforms to build IoT sensor enclosures for mobile weather stations.
- Built a real-time Adafruit data dashboard integrating MQTT, Google Drive, and SQLite for data logging and visualization.

Research Assistant

Sep 2020 – Jun 2021

ASU School of Mathematical and Statistical Sciences — Tempe, AZ

- Designed an undergraduate machine learning curriculum (MAT 400-level) that has been taught at ASU since Fall 2021.
- Processed 50,000 rows of U.S. population mobility data using the spectral clustering algorithm to model COVID-19 transmission patterns.

Software Development and Testing Intern

May 2020 – Aug 2020

Autowise.ai & Boschung — Chandler, AZ & Chicago, IL

- Designed and executed software and hardware tests for a self-driving robotic street sweeper, resolving issues identified during virtual and real-world road trials.
- Reviewed and managed testing data, providing feedback and recommendations to the R&D and Business teams.
- Led relocation of the full test set from Chandler to Chicago, including establishing a new test environment, producing new LiDAR maps, and training personnel for ongoing operations.

PUBLICATIONS

Peer-Reviewed Journal Articles

- Longitudinal dynamics of the nasopharyngeal microbiome in response to SARS-CoV-2 Omicron variant and HIV infection in Kenyan women and their children. *mSystems*, American Society for Microbiology, May 2025.
- Baseline Sequencing Surveillance of Public Clinical Testing, Hospitals, and Community Wastewater Reveals Rapid Emergence of SARS-CoV-2 Omicron Variant of Concern in Arizona, USA. *mBio*, American Society for Microbiology, Feb 2023.
- Prion protein is required for tumor necrosis factor alpha (TNF α)-triggered nuclear factor kappa B (NF- κ B) signaling and cytokine production. *Journal of Biological Chemistry*, Sep 2017. (*JBC Recommended Reads*, Oct 2017)

Conference Papers & Presentations

- HPL (Linpack) and Other Popular Benchmarks on Heterogeneous HPC Clusters. *RMACC HPC Symposium*, 2026. (*Presentation*)
- Tuning Workflow Management Systems for Shared HPC Resources. *RMACC HPC Symposium*, 2026. (*Presentation*)
- Provisioning a Large-Scale AI Platform Composed of Intel Gaudi2 Accelerators at Arizona State University. *PEARC*, 2026. (*Long paper*)
- Ten Practices for Refactoring Scientific Pipelines to nf-core DSL2 on Shared Slurm HPC. *USRSE*, 2026. (*Long paper*)
- Optimizing Nextflow-based Software on Shared HPC Resources: A Case Study with make_lastz_chains. *USRSE*, 2025. (*Long paper*)

GRANTS & FELLOWSHIPS

- USRSE Travel Grant. USRSE25. *(Awarded)*
- RMACC Scholarship. RMACC HPC Symposium 2026. *(Awarded)*
- CCMNet Travel Grant, Cyberinfrastructure Community-wide Mentorship Network. *PEARC26. (Awarded)*
- Better Scientific Software (BSSw) Fellowship Program. *2027 cycle. (Application in preparation)*

PROFESSIONAL & COMMITTEE SERVICE

- Committee Member, Scientific Subcommittee on IT and Informatics, Earth BioGenome Project.
- Planning Committee Member, Operational Data Analytics (ODA) Birds-of-a-Feather session, SC26.
- ASU Cluster Representative, Energy Efficient HPC Working Group (EE HPC WG).
- Mentor, mentorship program “Tuning Workflow Management Systems on HPC,” Cyberinfrastructure Community-wide Mentorship Network (CCMNet), 2026.
- Cyber Infrastructure Facilitator with CIREN project, 2026.
- Certified Instructor with The Carpentries, 2024 – present.

PROFESSIONAL DEVELOPMENT

- NSF-WildWEST Project Summer Field Camp — field engineering training, 2026.
- CyberAmbassadors program (Engineering Futures) certificate, 2025.
- Linux Cluster Institute entry and intermediate level certificates, 2024.

EDUCATION

M.S., Computer Science (Biomedical Informatics)

Dec 2023

Arizona State University — Tempe, AZ

B.S., Computer Science

Aug 2022

Arizona State University — Tempe, AZ