Robert Pearce

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Computer science student building scientific software and machine learning systems for large-scale simulation workflows. Experience developing Python and C/C++ tools, running HPC pipelines, and working with data-intensive scientific applications.

Education

Johns Hopkins University — Baltimore, MD
Incoming *Master of Science in Engineering, Computer Science* — *December 2027*

University of Nevada, Las Vegas — Las Vegas, NV
Bachelor of Science Computer Science, Minor in Mathematics (GPA: 3.73/4.0) — *June 2026*

College of Southern Nevada — Las Vegas, NV
Associate of Business (GPA: 3.77/4.0) — *December 2022*

Experience

Undergraduate Researcher, LEADS Lab (Dr. Paul La Plante) — September 2025 – Present
University of Nevada, Las Vegas — *On-Site*

- Executed 1,000 large-scale cosmological simulations of the *zreion* model on the Bridges-2 supercomputer using SLURM job arrays, automating 4D parameter sweeps and parallel execution across compute nodes.
- Designed and implemented a pipeline to generate kSZ temperature maps and computed angular power spectra (C_ℓ) via Fourier transforms to obtain statistical observables of the Epoch of Reionization.
- Applied Latin Hypercube Sampling to efficiently explore multi-dimensional parameter space, reducing the cost of grid searches.
- Processed simulation outputs into training-ready datasets and reduced storage requirements by 75% for large-scale experimentation.
- Built a machine learning emulator with uncertainty for the kSZ angular power spectrum, achieving under 5% error while reducing prediction time from hours to near real-time.

Supplemental Math Instructor — August 2023 – Current
College of Southern Nevada — *Hybrid*

- Mentored 80+ students per semester in mathematics courses (Calculus, Linear Algebra, Statistics), improving student performance through targeted problem-solving strategies and individualized support.

Accessibility Contributor — September 2025 – December 2025
Quorum Programming Language — *Hybrid*

- Identified and resolved 8 accessibility issues in iOS components, improving compliance with WCAG 2.1 AA standards and enhancing usability for visually impaired users.

Projects

reionemu — Scientific Python Package (PyPI) — March 2026 – Present
Python | PyTorch | Ray Tune | HDF5 | PyTest | GitHub Actions

- Built and published a Python package supporting scientific workflows, from simulation-output processing to model training and evaluation.
- Developed reusable pipelines for HDF5 data reduction, power spectrum computation, and dataset construction, reducing intermediate data size by 75% in large-scale experiments.
- Implemented a neural network emulator with Bayesian extensions (in development), achieving <5% error on held-out simulations and enabling near real-time predictions.
- Added reproducibility infrastructure including configuration dataclasses, saved checkpoints and experiment settings, documentation notebooks, automated testing, linting, and GitHub Actions CI.

Technical Skills

Languages: C/C++, Python, Rust, Java, SQL, HTML/CSS/JavaScript
Libraries & Frameworks: PyTorch, TensorFlow, Ray Tune, NumPy, PyTest
Tools & Platforms: Git, GitHub Actions, PyPI, CUDA, OpenMP, SLURM, Anaconda, Bridges-2 HPC
Other: HDF5, Bayesian Neural Networks, Hyperparameter Optimization

Certificates & Workshops

Certifications: Harvard CS50 Python (June 2024), IBM Data Structures and Algorithms (December 2023)
Selected Workshops: ACES: GPU Programming (Mar. 2026), Architecting Reproducible Science (Mar. 2026), Fine-Tuning LLMs with Domain-Specific Datasets (Apr. 2026), SDSC Data Storage and File Systems (Apr. 2026)