Rohan Pandey

Bellevue, Washington | (425) 428-2971 | rpande@uw.edu | Github | LinkedIn | Portfolio (Beta) | U.S. Citizen

EDUCATION

University of Washington, Seattle, WA — Expected Graduation: March 2026

BS in Applied and Computational Mathematical Sciences – Scientific Computing and Numerical Analysis

Relevant Coursework: Machine/Reinforcement Learning, Data Structures & Algorithms, Database Systems, High-Performance Scientific Computing, Optimization (Linear/Nonlinear/Discrete), Data Science, Advanced Neurotechnology

Awards: NASA Space Grant Awardee

SKILLS/TOOLS

Languages: Python, Java, C++, MATLAB, MySQL

Frameworks & Libraries: TensorFlow, PyTorch, Scikit-learn, NumPy, Pandas, Matplotlib

Machine Learning/AI: Reinforcement Learning (PPO, MCTS), Graph Neural Networks, Computer Vision, Deep Learning

Tools: Git, Linux/Unix, Vim, Bash, OpenBCI, Azure SQL Database, Simulink, Mathematica

Core Competencies: Computer Vision, Deep Learning, Data Structures & Algorithms, Statistical Modeling, Optimization

WORK EXPERIENCE

PricewaterhouseCoopers, Cloud & Digital SAP Intern, Seattle, WA — June – August 2025

- Engineered high-performance Python pipelines for large-scale data ingestion, applying **vectorization, parallel I/O, and memory-efficient batching concepts** from scientific computing to reduce processing latency
- Designed and deployed a secure, **self-service web application** enabling cross-functional teams to configure, trigger, and monitor automated workflows without technical overhead
- Implemented modular, reusable code architecture with robust logging and fault-tolerance, providing a **scalable framework** extensible to ML-driven monitoring and predictive analytics

Fred Hutch, Data Scientist Intern, Seattle, WA — August 2024 – June 2025

- Developed and solved **large systems of nonlinear ODEs** to simulate CAR T-cell and tumor population dynamics, parameterized with patient-derived data.
- Trained regression models with MSE loss to predict therapy outcomes and assess efficacy.
- Integrated nonlinear mixed effects models with numerical solvers to capture immune-cell exhaustion and conditioning dynamics at population and individual levels.

Naval Surface Warfare Center, Reinforcement Learning Intern, Bellevue, WA — October –December 2024

- Developed a reinforcement learning framework using a DDPG agents in MATLAB and Simulink to optimize aerodynamic efficiency in axial turbomachinery
- Simulated complex physical dynamics with embedded control loops and reward functions targeting lift, drag, and energy efficiency tradeoffs
- Integrated streamline curvature methods and potential/Euler flow approximations into a multi-objective design optimization pipeline

RESEARCH EXPERIENCE

MATH AI LAB — September 2025 – Present

- **Reinforcement Learning for Polynomials**: Designed a reinforcement learning framework with **Proximal Policy Optimization (PPO)** and **Graph Neural Networks** to synthesize efficient arithmetic circuits for polynomials. Achieved ~70% success rate on degree-3 polynomials using curriculum learning, symbolic verification, and shaped reward functions.
- Scaling framework to higher-degree polynomials and integrating **Monte Carlo Tree Search (MCTS)** for training efficiency; preparing open-source benchmarks and submitting results to **ICLR/ICML/NeurIPS**.

WASHINGTON EXPERIMENTAL MATHEMATICS LAB — September 2024 – June 2025

- Developed **checksum-triggered backdoors** in MLPs on MNIST, embedding activation logic in pixel parity patterns and masking with orthogonal transformations to evade gradient inspection.
- Designed **hybrid ReLU activations** and cryptographic-inspired techniques to minimize symmetry, obscure backdoor pathways, and strengthen adversarial ML defenses.