Nico Mannarelli

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EDUCATION

University of Maryland - College Park — Aug. 2023 – May 2027
B.S. Computer Science - B.S. Mathematics — *College Park, MD*
GPA: 3.40/4.00

Relevant Coursework: Linear Algebra, Differential Equations, Multi-variable Calculus, Computer Systems, Object-Oriented Programming (I,II), Discrete Structures, Data Science, Compilers, Real Analysis

TECHNICAL SKILLS

Languages: Python, C, C++, Java, MATLAB, SQL, Rust
Frameworks/Libraries: Pandas, Pytorch, Numpy, Qiskit, Pennylane, Ultralytics
Developer Tools: Git, Github, VScode, Jupyter, AWS, Azure

EXPERIENCE

Applied Research Lab for Intelligence and Security (ARLIS) — June 2025 - August 2025
Research Assistant — *College Park, MD*

- Conducted applied research in quantum machine learning and hybrid classical–quantum architectures for intelligence analysis and decision-support systems
- Achieved 97.3% accuracy on the MNIST dataset using a custom-parameterized quantum circuit optimized via PennyLane and PyTorch with a gradient-free evolutionary optimizer
- Deployed quantum simulation experiments on ARLIS's classified HPC environment, ensuring compliance with DoD and NIST security standards under Secret Clearance

FIRE Quantum Machine Learning Lab - University of Maryland — June 2024 - August 2024
Research Assistant (Research) — *College Park, MD*

- Conducted research on Variational Quantum Circuits (VQC) applied to Reinforcement Learning (RL)
- Focused on performance and trainability of quantum algorithms with data re-uploading
- Developed quantum-classical hybrid approaches to improve decision-making in classical control problems

FIRE Rapid Diagnostics - University of Maryland — August 2023 - December 2024
Research Assistant — *College Park, MD*

- Developed microfluidic and paperfluidic devices for point-of-care diagnostics
- Gained experience with Matlab, CAD, 3D printing, cutter-plotting, and PDMS molding for device fabrication
- Focused on rapid, on-site chemical and bio-analysis for healthcare, environmental monitoring, and disease control

PROJECTS

Bird Camera | *Python, AWS SageMaker, S3* (Repository)

- Developed end-to-end ML pipeline for bird detection using YOLOv8 architecture and SageMaker GPU infrastructure
- Implemented automated model downloading from cloud storage, reducing deployment complexity and enabling seamless continuous deployment pipeline
- Processed and converted NABirds dataset to YOLO format, managing 23GB of training data stored in Amazon S3 for cloud-based model training.

Reinforcement Learning with Quantum Variational Circuits | *Python, Pennylane, PyTorch, Qiskit* (Repository)

- Designed and implemented variational quantum circuits (VQC) using PennyLane, with multiple qubits and layers to enhance decision-making efficiency
- Analyzed performance differences between QRL and traditional reinforcement learning (RL) models in terms of learning speed and stability

OTHER

- Secret Security Clearance
- AI Alignment Club, Undergraduate Quantum Association