Erik Bloomquist

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Education

Bachelor of Science in Electrical Engineering Spring 2026
University of Florida *GPA: 3.98/4*

Work Experience

Undergraduate Teaching Assistant| *UF ECE Dept.* August 2024 - Present

- Assists Dr. Catia Silva in operation of Fundamentals of Machine Learning
- Course topics include Bayesian Learning, Generative Models, Clustering, Discriminative Classification, Dimensionality Reduction, Manifold Learning, Neural Networks, and Deep Learning

Undergraduate Teaching Assistant | *UF Engineering Education Dept.* May 2023 - July 2024

- Assisted Dr. Lilianny Virguez in operation of Elements of Electrical Engineering
- Course topics include AC & DC circuit analysis, Arduino projects, and basic C++ programming

Student Assistant- Database | *UF College of Dentistry* May 2023 - September 2023

- Worked with the UF College of Dentistry to migrate 5000 medical records into the College's database

Research Experience

Machine Learning for Financial Markets* | *Dr. Catia Silva*

- Designing machine learning frameworks for financial market prediction, focusing on risk modeling and interpretability; serving as project leader and sole student author
- Work supported by grant funding from UF Center for Undergraduate Research's AI Scholars Program

Literature Review: Adversarial Machine Learning* | *Dr. Damon Woodard*

- Surveying adversarial ML attacks and defenses to assess effectiveness and guide future research in robust deep learning
- Work supported by the Florida Institute for National Security (FINS)

From Black-Box to Glass-Box Models: Towards Explainability in Reinforcement Learning | *Dr. Damon Woodard*

- Trained common RL algorithms (DQN, PPO) on benchmark environments (Cart Pole, Mountain Car, Lunar Lander)
- Examined decision boundaries and extracted interpretable policy representations

Awards

Dr. Joseph S. Rosko Award | *Scholarship* Fall 2025

- Awarded $5000 scholarship for academic achievement and involvement in the ECE department

AI Scholars Program | *Research Funding* Fall 2025

- Awarded $1750 grant to lead independent research bridging machine learning, risk modeling, and financial prediction

Florida Institute for National Security (FINS) Talent Pipeline | *Fellowship* Spring 2024

- Awarded $5000 fellowship to perform research at the intersection of AI and national security

University Honors Program | *Recognition* Fall 2022

- Admitted to UF's University Honors Program, providing access to advanced coursework and academic enrichment

Presentations

2026 Spring Undergraduate Research Symposium* | *Poster Presentation* Spring 2026

- Will present my AI Scholars Program work on self-directed research in machine learning for financial market prediction

2025 Spring Undergraduate Research Symposium | *Poster Presentation* Spring 2025

- Accepted to present poster on interpretable reinforcement learning at the 2025 UF Spring Symposium.

Leadership & Involvement

Undergraduate Curriculum Chair | *Eta Kappa Nu (HKN) Epsilon Sigma* Spring 2024 - Present

- Represents IEEE's honor society at faculty curriculum committee meetings
- Selected to serve on the ECE student panel, answering curriculum-related questions from underclassmen in electrical and computer engineering

* In progress

Projects

Transformer-Based Stock Trading Agent

– Designed and implemented a reinforcement learning framework for financial market prediction using transformer encoders and an actor-critic architecture. Integrated macroeconomic indicators and stock-specific time series data to generate dynamic trading policies, with a focus on interpretability and risk-adjusted decision-making.

ECG Anomaly Detection Pipeline

– Developed a machine learning pipeline for real-time detection of cardiac anomalies using the MIT-BIH Arrhythmia Database. Compared classical ML algorithms and deep learning models, with emphasis on feature extraction, signal preprocessing, and classification performance.

Raspberry Pi Pico Waveform Generator

– Engineered a programmable waveform generation system leveraging the LTC1661 DAC and SPI communication. Implemented sine, square, triangle, and sawtooth wave outputs with adjustable parameters and calibration routines.

Skills

Programming & Tools: Python (PyTorch, TensorFlow, scikit-learn, NumPy, Pandas), MATLAB, C++
Data & Tools: Git, Altium Designer, LTspice, LaTeX, Jupyter, SQL
Machine Learning: Deep Learning, Reinforcement Learning, Adversarial ML, End-to-End ML Systems, Data Cleaning & Preprocessing
Signals & Systems: Digital Signal Processing, Biomedical Signal Analysis, Circuit Modeling
Professional Skills: Technical Writing, Effective Communication, Poster Presentations, Teaching & Mentorship

Relevant Coursework

Machine Learning Mathematics
Formal Methods for Robotics & AI
Stochastic Methods
Digital Signal Processing
Analog Circuitry
Applied Machine Learning Systems
Data Science
Communication Systems
Biomedical Image Analysis
Electrophysics