Tyrone Serapio

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EDUCATION

Brown University **May 2027 (Expected)**
BS Computer Science; AB Applied Mathematics-Economics Providence, RI

- **Cumulative GPA:** 4.00/4.00
- **Coursework:** Algorithmic Game Theory, Computer Systems, Foundations of AI, Accelerated Introduction to Computer Science (Data Structures & Algorithms), Linear Algebra, Probability, Multivariable Calculus

PROFESSIONAL EXPERIENCE

E-GLAMOR Group, Brown University Mar 2025 - Present
Undergraduate Research Assistant

- Migrated core ML pipeline from PyTorch to JAX (Flax), rewriting incremental continual learning modules on ImageNet and CIFAR-100, resulting in a **3× speedup** on GPU workloads on Linux.
- Trained autonomous negotiation agents using Counterfactual Regret Minimization (CFR) and Proximal Policy Optimization (PPO), increasing agent profit by **30%** and decreasing shortfall penalties by **40%** in dynamic supply chain simulations.

Fox-Kemper Research Group, Brown University Jan 2025 - May 2025
Undergraduate Research Assistant

- Developed a full-stack dashboard using React, FastAPI, and Mapbox, enabling real-time environmental monitoring of Narragansett Bay, covering **380+ million** m^2 of area.
- Produced geospatial maps using GeoPandas and Matplotlib to visualize ML-based predictions of cloud coverage and temperature.

Machine Learning for Physics and Astronomy, Brown University June 2025 - August 2025
Teaching Assistant

- Assisted students and designed assignments for random forests, LSTMs, and GANs applied to astronomical data.
- Hosted office hours 5x a week, troubleshooting code and guiding research projects.

PROJECTS

Market-based LLM Coordination | Python, PyTorch, Tensorflow 2025

- Designed multi-agent simulations inspired by real-world delivery tasks, implementing market-based mechanisms (prediction markets, Vickrey auctions) to coordinate LLM agents' beliefs and actions in Partially Observable Markov Decision Processes.
- Achieved **sub-0.25 Brier scores** in probabilistic forecasting and demonstrated emergent **incentive-compatible strategies** under information asymmetry.

Fink | React, TypeScript, Prisma, LangChain, Pinecone 2025

- Developed a multi-modal AI-powered platform for creating, organizing, and retrieving personal notes.
- Implemented a chatbot using OpenAI API & Langchain to facilitate easier retrieval of notes via natural language conversation.
- Built backend with Prisma and deployed vector embeddings in Pinecone, achieving **sub-100 ms** query latency.

Stream.ai | Swift, SwiftUI, Core ML 2024

- Built a mobile app to generate personalized exercise sets for swimmers, based on their best stroke.
- Trained and integrated a deep-learning video-action classifier model for the different exercises, attaining an accuracy of **90.2%**, providing real-time form feedback.

SKILLS

Languages: Python, Java, C++, JavaScript, TypeScript, Swift, SQL, HTML/CSS
Frameworks & Tools: React, Node.js, PyTorch, JAX, Tensorflow, Git, Flask, FastAPI, Pandas, AWS, Docker