

# Varun Vejalla

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## Education

**University of Virginia**, Charlottesville, VA

**August 2021 – December 2025**

**Combined Masters and Bachelor of Arts**

*MS in Computer Science · BA in Computer Science and Math with a minor in Philosophy*

- **GPA:** 4.0/4.0 (MS), 3.8/4.0 (BA)
- **Relevant coursework:** Software Analysis, Software Development, Data Structures & Algorithms, Computer Systems, Cybersecurity, Signal Processing and Feedback Control, Distributed Systems, Explainable AI, Graph Machine Learning, Learning in Robotics, Manifold Learning, Multi-Robot Navigation, Cryptography, Stochastic Processes, Linear Algebra
- **Awards:** 2022 and 2025 Putnam Prizes (top 500 in the Putnam Mathematical Competitions), 7<sup>th</sup> place in the 2024-25 regional International Collegiate Programming Contest, Dean's List

## Technical Skills

<b>Languages/Tools</b>	Python, Java, C and C++, SQL, MATLAB, TensorFlow, JUnit, Linux, Bash, Gradle, Git, Docker, JavaScript
<b>Concepts</b>	Data Structures, Machine Learning, Signal Processing, ML for Software Reliability, Software Design

## Experience

**Researcher in Cryptoeconomics** · UVA

**January 2025 – December 2025**

- Researched economic mechanisms in decentralized systems, focusing on selfish mining attacks in Bitcoin
- Used techniques from stochastic processes and game theory to identify vulnerabilities

**Teaching Assistant for Advanced Algorithms and Discrete Math and Theory II** · UVA

**August 2022 – December 2025**

- Work closely with instructors and other TAs to develop lesson plans aligning with course objectives
- Lead class lectures for over 100 students when needed

**Information Security Intern** · Q2 Software

**May 2024 – August 2024**

- Created an internal chatbot for security and compliance using TypeScript, Python, and the GPT-4 model
- Developed script to automatically parse and integrate internal security policies into the chatbot's knowledge base
- Used tools like Splunk and Tenable to identify and remediate vulnerabilities across the organization

**Researcher in Theoretical Computer Science** · UVA

**May 2024 – December 2024**

- Independently led research on the number of noisy comparisons needed to sort a list with given error probability
- Conducted literature reviews and developed models to analyze bounds on sorting with noise

**Research Assistant in the Security and Research Group** · UVA

**May 2023 – January 2024**

- Audited large language models for biases in their responses to queries regarding demographic stereotypes
- Verified robustness of results by using logically equivalent queries to check if they elicited similar biases

**Machine Learning Research Assistant** · UVA

**January 2022 – June 2022**

- Researched neural variations of algorithms for solving the bandit problem, a key topic in recommendation systems
- Designed experiments to evaluate and tune the performance of the neural algorithms using Python and PyTorch

## Projects

**Battlecode 2025 and 2026**

- Created autonomous player strategies in Java and Python for MIT's international AI battle programming competition
- Qualified for finals and placed 7<sup>th</sup> (2026) and 13<sup>th</sup> (2025) overall, outperforming hundreds of teams around the world

**Dynamic Cost Learning**

- Built inverse reinforcement learning framework to learn private cost functions of bounded-rational agents in multi-agent dynamic games
- Jointly trained policy, cost, and dynamics neural networks in PyTorch to capture stochastic agent behavior using custom loss functions
- Demonstrated effectiveness on model of multi-agent collision avoidance, showing accurate recovery of cost functions

**Virginia Crash Risk Assessment**

- Built machine learning model in Python (scikit-learn) to predict accident risk from vehicle, weather, and location data
- Cleaned and processed data from the Virginia Department of Transportation and the United States Census Bureau