

# Jorrel Rajan

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## EDUCATION

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### Princeton University

Bachelor of Engineering in Computer Science

*Minor in Statistics and Machine Learning*

Princeton, NJ

GPA: 3.905 / 4.0

August 2022 – May 2026

- Relevant Coursework: Algorithms and Data Structures, Systems Programming, Introduction to Machine Learning, Linear Algebra, Multivariable Calculus, Fundamentals of Statistics, Intro to Data Science

## EXPERIENCE

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### Electronics and Control Systems Intern

May 2023 – September 2023

*Princeton University Department of Physics*

*Princeton, NJ*

- Implemented control systems in C++ on an autonomous glider. Worked with team of 3, under a NASA contract.
- Engineered a web app using Flask, Python, HTML, and JavaScript to ease orienting ground-station antenna by tracking position relative to user.
- Designed 5 PCB iterations to house on-board electronics and sensors.
- Executed over 30 Hardware-in-the-Loop simulations with MATLAB, validating control systems and achieving a 40% reduction in development time for subsequent hardware iterations.

### Computer Science Intro Lab TA

February 2023 – Present

*Princeton University*

*Princeton, NJ*

- Facilitated tutoring sessions for COS 126, 226, and 217.
- Demonstrates core knowledge of Data Structures, Algorithms, and Systems Programming.
- Guided 20 students weekly with assignments, concepts, and debugging.

## RELEVANT CLUB EXPERIENCE

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### Avionics Team Lead

February 2022 – Present

*Princeton Rocketry Club*

*Princeton, NJ*

- Pioneered idea for and currently spearheading development of a fully student-developed flight computer in lieu of commercially available flight computers, for use in Princeton Rocketry's launch to 30,000 feet at the Spaceport America Cup in June 2025.
- Developing computer powered by an STM32 with capabilities of controlling air-brakes for accurate flight paths, managing a custom radio protocol, and filtering of on-board sensor data with Kalman and Bayesian filters.
- Extensive electronics experience with I2C and SPI communication protocols and circuit-board development.
- Directing team of 8 peers to design, and manufacture the computer and circuit board.

## TECHNICAL SKILLS

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**Languages:** Python, JavaScript, Java, C, C++, ARM Assembly, SQL, HTML/CSS, R, Swift

**Frameworks:** React, Node.js, Express.js, Vite, Flask, Django

**Libraries and Tools:** Git, MongoDB, Docker, Linux, Shell, pandas, NumPy, PyTorch, TensorFlow

## PROJECTS

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### NeuralCar | *Javascript, HTML, Vite, Node.js, Git*

August 2024

- Developed a self-driving car simulation using an evolutionary algorithm to tune/optimize a neural network.
- Created a 2D Physics Engine and Neural Network architecture without use of external libraries; implemented from scratch from first principles.
- Structured using object-oriented programming principles to parallelize training of the network by instantiating 1000+ agents to significantly decrease training time.

### TelemViz | *React.js, Flask, Websocket API, Python, Node.js, C++, Git*

July 2024

- Designed a full-stack web application to display live telemetry data on a dashboard using Python WebSockets as back-end and React as front-end.
- Constructed a Python script as back-end to relay live telemetry data from a micro-controller to a WebSocket for rapid data communication. Originally utilized Flask but pivoted to WebSockets to reduce latency to 10ms.
- Designed front-end with React.js, Three.js, and Recharts.
- Created for use for in Princeton Rocketry Club's many future launches.