Varun Rayamajhi

410 Westhampton Way, Richmond VA 23173 | varun.rayamajhi@richmond.edu | 10varun17 | 804-497-0932

EDUCATION

University of Richmond, Richmond, VA *Expected May 2027*

Bachelor of Science Candidate | **Major:** Computer Science, **Minor 1:** Physics, **Minor 2:** Mathematics

The University of Edinburgh, Edinburgh, Scotland *September 2025 - May 2026*

Visiting Student | **Department:** Informatics

Cumulative GPA: 4.0/4.0

Relevant Coursework: ML & AI in Robotics; Lagrangian & Hamiltonian Neural Networks; Algorithms; Classical Mechanics; Digital Signal Analysis; Probabilistic Modeling & Reasoning; Computer Security; Fourier Analysis

Honors: Dean's List (4 semesters), Richmond Scholar (1 of ~25 scholars selected from ~11,000 applicants), Robins Science Scholar Award (< 3% awarded per class, merit-based), Global Scholarship (academic full ride)

TECHNICAL SKILLS

Languages: Python, Java, C++, Dart
Robotics & AI/ML: ROS2, PyTorch, TensorFlow, Scikit-Learn, OpenCV, Gazebo, CasADi
Scientific Computing & Data Analysis: Mathematica, NumPy, Pandas, SciPy, Matplotlib, Seaborn
Development Tools & Platforms: Linux, Git, Android Studio, Flutter, RESTful API design
Hardware & Electronics: Arduino, Proteus, Eagle EDA, Sensor Integration, Circuit Design

EXPERIENCE

University of Chicago Data Science Institute, Chicago, IL *June 2025 – Present*

Research Software Engineering Intern - Human Computer Integration Lab (Dr. Pedro Lopes)

- TBD

University of Richmond Robotics Lab, Richmond, VA *May 2025 – June 2025; August 2025 – Present*

Robotics & Control Research Assistant - Dr. Patrick Martin

- TBD

University of Richmond Robotics Lab, Richmond, VA *June 2024 – August 2024*

Research Assistant - Dr. Patrick Martin

- Engineered multi-agent robotic system using Python & **ROS2**, implementing decentralized coordination with **action servers & clients**.
- Developed scalable ROS2 packages with custom messages and launch files to streamline agent deployment and communication.
- Analyzed simulated data to assess control algorithms & identify behavior patterns or anomalies for thorough testing & debugging.
- Designed an **experimental setup** for formation control with three **real differential-drive robots (TurtleBots)** and tested the controllers.
- Documented the progress, reflected upon the challenges, and made research plans for each week in weekly research journal.

Space Technology & Aeronautical Rocketry Lab (STAR), Surat, India *August 2022 – September 2022*

Avionics Intern

- Developed design criteria for the STP avionics system, covering **testing methods, production costs, quality standards, & timelines**.
- Simulated the system using Proteus and ArduinoIDE, and designed a **PCB** using Eagle, focusing on circuit optimization.
- Wrote C++ code for an avionics system with auto-ignition, remote control, warning signals, data handling, & fire extinguisher.
- Supervised work across both the mechanical and avionics departments, overseeing a team of four members to meet project goals.

International Movement for Leisure Activities in Science & Tech (MILSET), Romania *May 2022 – August 2022*

National Delegate & Project Leader

- Developed & integrated **hardware-software system** using Arduino UNO, DS18B20 temperature sensors, RTC module & SD Card.
- Conducted rigorous testing & debugging of the system, troubleshooting issues with hardware connections & software functionality.
- Implemented SD card logging for **real-time data storage & retrieval** & used RTC for timestamping temperature measurements.
- Utilized the integrated system to study the impact of greenhouse layering on internal temperatures & presented results at MILSET.

PROJECTS

Autonomous Mobile Robots (AMR) Dispatch Optimization Simulator *November 2024 – Present*

- Developed an automated warehouse management system with multi-robot coordination to ensure efficient task completion.
- Implemented the A* path-finding algorithm for optimal robot navigation and incorporated obstacle avoidance mechanisms.

LabFlowAPI *November 2024 – December 2024*

- Designed & developed a scalable RESTful API using C++ and Crow micro web service framework for laboratory management.
- Focused on comprehensive API design, rigorous testing, and detailed documentation to deliver a scalable and maintainable solution.

Robotics Manipulator *November 2024 – December 2024*

- Modeled and visualized the dynamics of a multi-link robotic manipulator, which allows customizable link lengths and masses.
- Utilized Hamiltonian mechanics to simulate manipulator's motion, accounting for generalized coordinates & constraints in system.

Life Expectancy Prediction *July 2024 – August 2024*

- Developed a comprehensive ML solution to predict life-expectancy based on socio-economic and health related factors.
- Encompassed the entire pipeline from data pre-processing and exploratory data analysis to feature engineering and model evaluation.

PROFESSIONAL AFFILIATIONS

- Institute of Electrical and Electronics Engineers (IEEE)
- IEEE Robotics and Automation Society