

Rhea Goswami

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EDUCATION

Cornell University

Ithaca, NY

BS in Computer Science, Electrical and Computer Engineering (GPA: 3.8/4.0)

Aug. 2022 – May 2026

Relevant Coursework: Algorithms (FA24 TA), Machine & Deep Learning, Robot Foundations & Learning, Operating & Computer Systems, Optimization, Data Structures, Linear Algebra, Probability & Statistics

Optimization Research: Math tools to create fairer suburban transportation with Professor Samhita Samaranayake

EXPERIENCE

Robotics and Software-Hardware Integration Intern

May 2024 – Present

MITRE; Center for Securing the Homeland

McLean, VA

- Prototyping and rigorously testing complete autonomy for swarm robots with custom software and hardware stack: Ardupilot with I2C integration, MQTT & TCP stack, ethernet multi-threading, & Raspberry Pi programming
- Optimized LLMs for climate research using NLP and topic modeling to extract keywords and Retrieval-Augmented Generation with academic datasets to enhance accuracy, incorporating user feedback and client suggestions

Electrical Team Member ('22-'24) & Intelligent Systems Lead ('24-'25)

Oct. 2022 – Present

Cornell University Unmanned Aerial Systems (CUAir) - 4th Place 2023 SUAS Competition

Ithaca, NY

- Designed, prototyped, and implemented a 90% successful mission-critical sensor system on PCB to control the payload dropping mechanism during flight requested by Pixhawk; collaborating with a team of students
- Debugging and testing accuracy of backend server and server-client integration with Pi peripheral using Flask & databases for autonomous image detection & classification in Python, increasing code efficiency by 80%
- Building and integrating novel obstacle avoidance system using LiDAR, path planning, and SLAM for aircraft in C++, constructed custom testing platform and algorithms (Kalman Filters and Euclidean Cluster) for localization

Cornell Course Management System (CMSX) Developer

Feb. 2024 – Present

Cornell University - Java, Javascript, React, REST API, Git, JUnit, GUI

Ithaca, NY

- Improved functionality to link scores for groups, fixed user-facing errors for comments and score totals using Java and Javascript for a system used by over 8,000 students and staff for over 100 courses
- Implemented stress testing, created and reviewed three pull requests, and 25% improved user satisfaction

Software Engineering Intern

May 2023 – Aug. 2023

MITRE; Center for Securing the Homeland

McLean, VA

- Re-designed drone selection tool employing Agile methodology for 80+ drones using HTML, CSS, and Javascript for frontend and JSON for data interchange, reduced object rendering time by 75% with custom Python scripting
- Developed novel IR image object detector leveraging YOLOv5 and PyTorch frameworks on CUDA, 85% accuracy

PROJECTS

Path Planning for Autonomous Race Cars | *Python, ROS, Gazebo, Optimization, Git*

Jul. 2024 – Present

- Generating localized path by formulating an optimization problem and using dynamic window path planning to minimize time, visualized with Gazebo plots in ROS
- Reduced crashes with moving objects by 60% using SLAM, rectangle fitting for other vehicles, and Rapidly-Exploring Random Trees for avoidance path planning

Sudoku Solver & Verifier | *C++, Recursive Backtracking, Optimization, Git*

Jul. 2024 – Present

- Developed command line tool in C++ to solve and verify sudoku puzzles leveraging recursive backtracking
- Optimized solver by 40% through formulation of constraint satisfaction problems (linear programming and traditional algorithm graph coloring) and reduction of branching factor

Reaction Time Game for Two Human Players | *Verilog, VHDL, FPGA*

Apr. 2023

- Generated a digital circuit for a 15-state FSM in VHDL and Verilog and tested on FPGA board for false starts with 98% accuracy

TECHNICAL SKILLS

Languages: Python, Java, OCaml, C/C++, SQL, HTML/CSS, JavaScript, & MATLAB

Data Science: R, Hadoop, Pandas, SQL, Scikit Learn, Keras, TensorFlow, Spark, Matplotlib, & NumPy

Hardware & Tools: Verilog, VHDL, Arduino, Rasp. Pi, Ardupilot, Altium, Git, React.js, Node.js, Docker & Ubuntu