APARAJITO SAHA

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EDUCATION

Bachelor of Science, Cornell University, Ithaca, NY, USA **Aug 2018–May 2022**

Majors: (1) Electrical and Computer Engineering (2) Computer Science (with Honors)

CGPA: 3.67 **Honors:** Dean's List (multiple semesters)

Selected Coursework: Embedded Operating Systems, Digital Design with Microcontrollers, Operating Systems Practicum, Computer Architecture, Machine Learning, Foundations of Robotics, Analysis of Algorithms, Functional Programming & Data Structures

WORK EXPERIENCE

Teaching Assistant, ECE 5725: Design with Embedded Operating Systems, Cornell University **Aug 2021–Present**

- Taught 2 weekly lab sessions, held 4 hours of office hours weekly and graded assignments for a 70+ person graduate level course on design and programming with embedded Linux taught by Professor Joseph Skovira

Electrical Engineer & Team Lead, Cornell Cup Robotics, Ithaca, NY, USA **Sep 2019–Present**

- Implemented electrical & low-level computing systems to enable autonomous & interactive operation for the "C1C0" robot
- Communicated with faculty on procedural details, assessed teammate contributions & represented the team at recruitment events
- Defined and developed electrical system requirements for C1C0 in collaboration with mechanical engineering & computer science teams and guided team members on electronics development and embedded systems programming
- Designed a custom communication interface for peripheral sensors on C1C0 using a low latency multithreaded scheduler on a Jetson Nano for synchronizing commands between devices and a PCB for sensor communication on the Teensy microcontroller

Electrical Engineering Intern, Buzr Labs, New York City, NY, USA **Aug 2020–Aug 2021**

- Developed environmental sensing circuitry for indoor temperature and humidity indicators and a custom interface PCB to provide signal routing for the Buzr Pro smart home device to provide universal compatibility with legacy home intercom systems
- Tested and contributed to firmware design for device control by investigating errors with the MQTT communication protocol and using logic analyzers to debug microcontroller signals legacy systems

Electrical Engineering Intern, New Ascent, Arnold, MD, USA **Jan 2021–May 2021**

- Performed PCB schematic design & component layout for sensing circuitry and power management on a chip satellite for educational applications
- Wrote firmware for SPI communication with onboard memory on the satellite and tested I2C and UART code functionality for peripheral sensors and GPS transmission

RESEARCH

Undergraduate Researcher, EmPRISE Lab, Cornell University **Aug 2021–Present**

- Investigated a novel perception mechanism using soft material based capacitive sensing to map points of contact and update control algorithms for the assistive Kinova Jaco robot arm under Professor Tapomayukh Bhattacharjee's guidance

Undergraduate Researcher, Space Imaging and Optical Systems Lab, Cornell University **Jan 2020–May 2020**

- Planned and documented a tether system for supplying power and communication signals to a wall–climbing robot expected to perform metrology analysis for telescope mirrors in Chile's Fred Young Submillimeter Telescope observatory

SELECTED PROJECTS

ExPiRior – Autonomous robotic COVID–19 testing station controlled by speech input on a Raspberry Pi 4. Used server access for unique patient identification and could conduct sample collection using a robotic arm in under 40 seconds

EGOS – Lightweight UNIX–style operating system implemented entirely in C and running within a Linux subsystem. Featured a custom multilevel queue scheduler, threading library, data caching and complete filesystem

Boids – Implementation in C of the "boids" artificial life algorithm on the PIC32 using protothreading and displayed on a TFT screen. Optimized with CPU overclocking, cache–locality and algorithm modifications to animate over 500 boids at 30 FPS.

SPECIALIZED SKILLS

Microcontroller Programming, Embedded Linux Development, PCB Design & Testing, Communication Protocols, Prototyping

Programming Languages: Python, C, C++, Bash, Java, MATLAB, OCaml

Programs: Altium Designer, Autodesk Eagle, Embedded Linux (Ubuntu, Debian), GitHub, ROS, SOLIDWORKS