**Objective** Electrical Engineering major with strong analysis skills and experience in power systems and robotics, seeking a summer 2025 internship in PCB design, Signal Processing, and RF Engineering. Involved in GT Experimental Rocketry and Aquabots VIP. Persistent and adept at working in high-paced environments to solve complex issues and pioneer excellent engineering solutions in diverse teams for intricate and focused fields like embedded systems, controls, and electromagnetics. Check out my [website](https://ayushbanerjee.com/) (ayushbanerjee.com).

**Education Georgia Institute of Technology | Atlanta, GA** August 2023 – Present Bachelor of Science in Electrical Engineering (GPA 3.92) *Expected Graduation, May 2025*

# Skills

**Programming:** Java, Python, Julia, C, STM32, C++, VHDL, SPI and I2C, MIPS Assembly, WiFi,

**Hardware:** Arduino, STM32, Oscilloscopes, PCBs, 3D Printing, FPGAs, Modem SATCOM, MEMS, Photonics, Antennas

**Software:** Solidworks, Altium, KiCAD, OpenCV, PyTorch, MATLAB, ETAP, SKM, DSP, LabVIEW, FRED

**Experience**

**Kimley-Horn | Atlanta, GA** May 2024 – August 2024

***Electrical Engineering Intern***

* Modeling and simulating DC/AC cables, inverters, transforms, combiners, and breakers for solar plants for EV.
* Employed ETAP and SKM for ampacity, short circuit, arc flash, load flow, and grounding analysis.

**Georgia Institute of Technology | Atlanta, GA** August 2023 – Present ***Research Assistant / Low-Frequency Radio Lab***

* Assembled preamplifiers, receivers, and antennas to sense and collect magnetic field fluctuation data in the ionosphere.
* Programmed receivers in C to process the data from the antennas and tested their functionality with an oscilloscope.
* Revamp receiver for lower frequencies, faster DAQ sampling rate, new anti-aliasing filter PCB, and newer C code.

**Georgia Institute of Technology | Atlanta, GA** May 2022 – July 2023

***Research Assistant / Power Systems Optimization Lab***

* Developed 2300-bus synthetic test case using Python, MATLAB, and Julia using graph theory and AC circuits.
* Modeled Ukrainian power grid with transmission lines, generation units, and load demands for defense studies.

# Publications

Harris, R., Banerjee, A., & Molzahn, D. K. Synthetic Test Case for Ukraine’s Power Grid.

# Projects

**Sign Language Detector** June 2023 – July 2023

* Trained a sign language symbol classifying model in PyTorch using the TinyVGG recognition architecture.
* Gathered 320 hand images per sign language image and preprocessed using OpenCV and CVZone.

**Mailbox Detector** September 2023 – Present

* 4-layer PCBs with Arduino interfacing with MPU6050 gyroscope and NRF Radio for mailbox opening detection.
* Calculated currents for trace widths, antenna trace impedance matching, and signal integrity electromagnetics.

# Relevant Coursework

**Electromagnetics:** Maxwell’s Equations, Transmission Lines, EM Wave Reflections and Non-Ideal Conductors

**Feedback Control Systems:** Laplace Transforms, Performance Criteria, PID Controller, Root Locus and Nyquist

**Circuit Analysis:** Thevenin/Norton theorems, operational amplifiers, RL, RC, RLC Circuits, Sinusoidal Inputs, Bode

# Clubs and Activities

**Georgia Tech Experimental Rocketry | Flight Computer Engineer** August 2023 – Present

* Designed 6-layer STM-32 control board using Altium will interface with battery, sensor, and power boards.
* Flash memory, radio transmission, USB impedance match, sensor communication protocols, e-match circuitry.
* Working on programming the STM in C and testing whether flashing code works and sensors can transmit data.

**Aquabots VIP | PCB Design Engineer** January 2024 – Present

* Refactoring ESP-32 control and sensor boards using KiCAD to be the PCBs for the MicroFloat maritime robot.
* Replaced the ESP with new model, put one dual-channel voltage regulator, confirming schematics for sensors.