

# Kushal Parekh

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## Education:

**MS Electrical and Computer Engineering** | *University of Pittsburgh*

Aug 2025 – Apr 2027 | Pittsburgh, PA

GPA: 3.95 | Fully funded researcher at NSF SHREC

**BS Electrical Engineering + Computer Science Minor** | *University of Pittsburgh*

Aug 2021 – Apr 2025 | Pittsburgh, PA

GPA: 4.00 | Honors College Degree | Academic Scholarship

**Relevant Coursework:** Computer Vision, Robotics and IoT Systems, Robotic and General Control, Space Engineering, Data Structures & Algorithms, Dependable Systems, Computer Architecture, Fault-Tolerant Electronics

## Work Experience:

**NASA IV&V (TMC Technologies)** | *System Engineer Intern*

May 2025 – Present | Fairmont, WV

- Improved satellite simulator fidelity by implementing an attitude determination and control system in Fprime using C++
- Doubled simulator features by adding 55+ commands and 150+ telemetry Channels across 13 spacecraft components in Fprime flight software using C++
- Implemented custom startup sequencing script for Fprime using Docker and Bash
- Facilitated bi-directional UART communication on an emulated Zynq Cortex-A9 board leveraging QEMU and Petalinux

**GE Vernova** | *Electrical Engineer Intern*

May 2024 – Aug 2024 | Imperial, PA

- Programmed and benchmarked a high-speed, customizable function generator, boosting performance 50% by reducing interrupt service routine bloat on an STM32 microcontroller
- Tested and validated 5 high-voltage gate drivers through 3 performance and timing experiments

**University of Pittsburgh** | *Teaching Assistant for The Art of Making*

Aug 2023 – Apr 2024 | Pittsburgh, PA

- Mentored 60+ total students to build project management, prototyping, and programming skills
- Led 7 Workshops on robotics, modular electronics, controllers, UI/UX, and soldering

**GE Power Conversion** | *Electrical Engineer Intern*

May 2023 – Aug 2023 | Imperial, PA

- Created and verified power electronics analysis script to reduce runtime 100x and increase data output 10000x compared to Simulink, written using MATLAB
- Developed multi-dimensional data visualizations for large quantities of simulation output data using MATLAB

## Projects:

**C.A.V.E.M.A.N.** | *Cave-Mapping Autonomous Rover* | [caverobotics.com](http://caverobotics.com) | *3rd Place Departmental Winner*

- Managed 4 Engineers to design, manufacture, and test an Autonomous Rover to navigate and map cave environments
- Generated 10 accurate 3D cave maps utilizing RGB-D camera images, OpenCV, Meshroom, and RTAB-Map
- Implemented inter-system and rover-to-camera communication interfaces with 40+ unit-tests for automatic rover control using UART, Protocol Buffers, ROS2, XML, and SDL3 all written in C++
- Designed VR map walkthroughs and low-latency teleoperation tested by 50+ users using Three.js, Unity, and WebRTC

**LiteMonitr** | *64x32 Programmable LED Live-Drawing Display with a Website Interface*

- Designed hardware and firmware to receive and parse Bluetooth packets to draw pixels using an ESP32 MCU in C++
- Reduced live-drawing lag 8x and eliminated data loss using data encoding and packet queues in JavaScript

**SeizureSensor** | *Wearable Nocturnal Seizure Detection Platform* | *Best Healthcare Project and 2nd Overall Hackathon Winner*

- Developed an OpenCV computer vision model paired with live biometric data to detect seizures and alert caretakers

## Skills:

C++, C, Python, OpenCV, Java, MATLAB, JavaScript, HTML, CSS, Bootstrap, C# | Git, GDB, ROS2, Docker, Linux, Simulink, REST APIs, Bluetooth, Wi-Fi, Sensors, SPI/I2C/UART, WebRTC, WebSockets | Controls, System Design, Project Management, Microcontrollers, Embedded Systems, Ground and Flight Software (COSMOS, YAMCS, cFS, Fprime), Unity, VR