Kushal Parekh

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Education:

University of Pittsburgh: Pittsburgh, PA

M.S. Electrical and Computer Engineering — Aug 2025 – Apr 2027
Researcher in Space High Performance and Resilient Computing **(SHREC)** Lab

B.S. Electrical Engineering | GPA: **4.0** — Aug 2021 – Apr 2025
Frederick Honors College Joint Degree | Computer Science Minor

Work Experience

Electrical Engineering Intern | *GE Vernova* — May 2024 – Aug 2024

- Validated 5 Gate Drivers through 3 Rigorous Timing and Performance-Matching Tests
- Programmed & Benchmarked a High-Speed, Customizable Function Generator on an *STM32 MCU*

Teaching Assistant for The Art of Making | *University of Pittsburgh* — Aug 2023 – Apr 2024

- Mentored 60 students directly to build *Project Management, Prototyping*, and *Programming Skills*
- Led 7 Workshops/Demos for *Soldering, Robotics, UI/UX*, and *Modular Electronics & Controllers*

Electrical Engineering Intern | *GE Power Conversion* — May 2023 – Aug 2023

- Created & Iterated Power Electronics Simulation Script to Reduce Runtime 100x and Increase Data Output 10000x utilizing *MATLAB & Simulink*, Verifying Accurate Results with *Simulink*

Physics Firmware Software Developer | *University of Pittsburgh* — Mar 2022 – Apr 2023

- Programmed *Machine Learning Binary Tree Classification* Algorithm for Particle Physics Simulations & Tested 60 Configurations to track *FPGA* Speeds using *Python, & Vivado HLS*

Projects:

C.A.V.E.M.A.N. | *Cave-Mapping Autonomous Rover* — Jan 2025 – Apr 2025

- Managed 5 Engineer Team to Design, Manufacture, & Test Cave-Mapping Rover to detect dangers & conditions of cave environments without human intervention using 13 sensors & actuators
- Generated 10 High Accuracy Maps from Images utilizing Computer Vision Filtering, Sampling, & Photogrammetry, utilizing *OpenCV, Meshroom, RTAB-Map, Blender & RGB-D Camera*
- Designed Website & Virtual Reality Map Viewers for Intuitive & Accurate Walkthroughs tested by 30+ Users using *Three.js, Meta Quest 2, & SimLab Composer*
- Implemented Rover& Camera Communication Framework to manually & automatically control rover using *custom UART wrapper, Protocol Buffers, ROS2, XML, & SDL3 in C++*

LiteMonitr | *Hardware Live-Drawing Display* — Dec 2024; Dec 2023

- Created & Iterated 64x32 LED Live-Drawing Display interfaced with a *Web-Bluetooth App*, controlled by an *ESP32 MCU using I^2C, written with C++ & JavaScript*
- Reduced live-drawing lag 800% & Eliminated Data Loss using Data Encoding & Packet Queues

SeizureSensor | *Wearable Nocturnal Seizure Detection Platform* — Sept 2024

- Won $400 through Best Healthcare & 2nd Best Overall Project at SteelHacks XI Hackathon
- Detect & Measure Seizure Biological Thresholds to Trigger Alarm from Simulated Hospital Data/Recordings using *3 Biometric Sensors & a Computer Vision Model on a Raspberry Pi*

To-Do List Auto-Updater | *School Assignment Scraper & Organizer* — Sept 2024; Jan 2024

- Parse & Organize Canvas and GradeScope Assignments into Todoist App automatically using *custom HTML parser, REST APIs, cURL, & QT Setup UI in Python*

Autonomous Racing Robot | *Final Project for CyberPhysical Systems Class* — Apr 2024

- Developed *Bluetooth*-controlled autonomous racing robot, placing 3rd, outputting 1000s of sensor datapoints over *Wi-F and MQTT*, displayed through *Azure & NodeRed*
- Implemented Adaptive Course Maneuverability allowing high autonomous stability utilizing *Web Bluetooth*, *Ultrasonic Distance Sensors & PID Control*

Additional Skills: *Java, Linux, Git, Docker, Altium, System Design, Space Engineering*