Kushal Parekh

Sellersville, PA | +1 (267) 772 2647 | parekhkushal17@gmail.com
github.com/KushalP17 | kushalparekh.com | linkedin.com/in/kushalp17

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

Systems Engineering Intern | NASA IV&V (TMC Technologies) — May 2025 – Present

- Implemented Attitude Determination and Control System in Satellite Simulator (NOS3), Improving Simulation Fidelity by 75% using *Fprime Flight Software, C++, Git, and GDB*
- Added 50+ Commands and 150+ Telemetry Channels across 12 Satellite Components in NOS3, Increasing Simulator Features 2x using *Fprime Flight Software and C++*
- Facilitated Bi-Directional UART Communication on an Emulated Zynq Cortex-A9 Board leveraging *QEMU, PetaLinux, Device Trees, and custom Linux Kernel Modifications*

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

- Validated 5 Gate Drivers through 3 Precise 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 and Controllers*

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

- Created and Verified Power Electronics Performance and Analysis Script to Reduce Runtime 100x and Increase Data Output 10000x compared to *Simulink, using MATLAB*

Projects:

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

- Managed 5 Engineer Team to Design, Manufacture, Test Cave-Mapping Rover to autonomously Navigate and Map Cave Environments using Depth Camera, 4 sensors, and 8 actuators
- Generated 10 High Accuracy 3D Maps with Rover-Captured Images utilizing *OpenCV, Meshroom, RTAB-Map, Blender and RGB-D Camera*
- Designed Portfolio Website and Virtual Reality Map Viewers for Walkthroughs tested by 30+ Users using *React Three Fiber, Three.js, Bootstrap 5, Meta Quest 2, and SimLab Composer*
- Implemented Inter-System and Rover-to-Camera Communication Interfaces for Abstracted Automatic Control using *UART, Protocol Buffers, ROS2, XML, and SDL3 in C++*

LiteMonitr | Hardware Live-Drawing Display — Dec 2024

- Designed 64x32 LED Live-Drawing Display controlled by a *Web-Bluetooth App*, using an *ESP32 MCU, I2C, C++, and JavaScript*
- Reduced live-drawing lag 8x and Eliminated Data Loss using Data Encoding and Packet Queues

SeizureSensor | Wearable Nocturnal Seizure Detection Platform — Sept 2024

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

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-Fi and MQTT*, displayed through *Azure and NodeRed*
- Implemented Adaptive Course Maneuverability allowing high autonomous stability utilizing *Web Bluetooth*, *Ultrasonic Distance Sensors and PID Control*

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