Priyanshu Sarkar

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Education

University of Waterloo — Waterloo, ON
Bachelor of Engineering, GPA: 3.9 — *08/24 – 05/29*

Experience

Midnight Solar Car Design Team, University of Waterloo — Waterloo, ON
Battery Mechanical Design Intern → Battery Team Lead — *08/24 – Present*

- Optimized battery thermal management by running CFD simulations in *Simscale*, improving predicted cooling efficiency.
- Prototyped and validated a cooling system for the solar car battery enclosure, ensuring safe operation under competition conditions.
- Engineered a battery box mounting solution, confirmed via FEA to withstand 5G acceleration loads for crash safety.
- Designed and manufactured Lithium-ion 1s9p battery modules, improving pack serviceability and safety.
- Programmed an automated capacity testing rig to control a digital multimeter (DMM) and electronic load, enabling accurate measurement of battery capacity and internal resistance.
- Developed a fusing test rig with a shunt resistor, DMM, and proprietary control software to characterize nickel strip fusing reliability at 40A over-current conditions, applying battery safety and reliability standards.
- Analyzed test data using Python/Excel to generate fusing curves and performance trends.
- Hands-on spot welded and assembled auxiliary battery packs, including protective heat-shrink housing and interconnects.

Tutor — 08/21 – Present
Wiz Robotics — *Richmond Hill, ON*

- Taught 40+ students (ages 8–12) to program in Scratch and build with EV3 robots, fostering early STEM engagement.
- Incorporated Montessori-inspired teaching methods to encourage curiosity and independent problem-solving.
- Developed custom robotics and programming course materials now used across multiple classes.

Projects

Direct Drive Simulator — 08/25 – Present
Personal Project

- Repurposed a high-torque hoverboard motor to build a prototype direct drive racing wheel.
- Designed and fabricated a clutch, base, and accelerator using hall-effect sensors for precise input.
- Developed and tested a basic H-pattern shifter to simulate manual gear shifting.

Smart Roomba Attachments — 05/25 – 07/25
SpurHacks / Personal Project

- Reverse-engineered a robotic vacuum and integrated an ESP32-C3 to enable custom attachment presets.
- Designed and 3D-printed a baseboard cleaning attachment to extend the Roomba's functionality.
- Programmed Raspberry Pi scripts and home automation logic to auto-detect and activate attachments.
- Presented at SpurHacks; invited to join an accelerator program for commercialization.

Bluetooth Speaker System — 05/24 – 08/24
Personal Project

- Designed an acoustic housing in SolidWorks and 3D-printed prototypes with vibration damping.
- Built a 10W, 6-channel amplifier circuit in Altium and fabricated it through PCBWay.
- Integrated an Arduino to provide startup audio cues and system feedback.

Technical Skills

Design & Simulation: SolidWorks (CAD, FEA, GD&T), Ansys CFD, SimScale, Altium Designer, Simulink
Programming & Data: Python, Matlab, C++, Java, Pandas, NumPy, Matplotlib, data acquisition & analysis
Fabrication & Prototyping: 3D printing (Bambu Labs), machining, woodworking, spot welding, soldering, micro soldering
Other: IoT (ESP32, Raspberry Pi, Arduino), circuit design, battery pack assembly/testing