Parth Dhingra

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Education

Freshman, George Mason University   (Class of 2029)
- B.S in Mechanical Engineering
- GPA: 3.20 | Relevant Coursework: Calculus II, Computer Science 112 (Python), Physics I

Advanced High School Diploma, Chantilly High School   (August 2021 – June 2025)
- GPA: 3.67

Experience

Head Mechanical Captain, Chantilly Robotics FRC 612 Team   (2023 - 2025)
- Mentored and trained 30+ members in the operation of advanced machinery, metal machining, computer-aided design (CAD), and 3D printing techniques.
- Oversaw and aided in the design, prototyping, and fabrication phases of a 120-pound competition robot for the FIRST Robotics Competition.
- Collaborated with other team members, including mentors, leadership to keep our 100-person team organized and ensure our robot was completed within the strict six-week deadline.

Owner, PD Ventures LLC, Online Business   (2023 - Present)
- Founded and currently manage a successful 3D printing online business specializing in functional 3D-printed products.
- Designed and produced high-quality 3D-printed products using additive manufacturing techniques.
- Achieved $5000+ in revenue in the first year by selling products on Amazon, Etsy, and eBay.
- Managed all aspects of order fulfillment, including packaging, shipping, and tracking.

Technology Student Association Member   (2021 – 2024)
- Used CAD and prototyping skills to design and fabricate CO_2 dragsters, robots, and other engineered projects for TSA competitions, utilizing 3D printers as well as metal and woodworking tools to produce competition-ready products.

Virginia Space Coast Scholar, Virginia Space Grant Consortium   (2022 - 2023)
- Researched topics related to NASA's orbital and suborbital missions that are launched from NASA Wallops Facility.
- Produced multiple APA technical reports under strict deadlines.

Counselor in Training, SciGenius (2023)
- Taught STEAM concepts using engaging and fun activities to classes of 15+ elementary schoolers.

Honors and Awards

- National Technical Honor Society   **(2023 – 2025)**
- 3rd place in Chantilly High School Science Fair   **(2022)**
- 4th place in Technology Student Association (TSA) Dragster Design Competition   **(2023)**
- College Board AP Scholar   **(2023)**

Skills & Certifications

Technical Skills: CAD, SolidWorks, Onshape, MATLAB, 3D Printing (FDM), Metal Machining, Woodworking, Laser Cutting, Arduino, ESP32, Python, Java

Certifications: GMU MIX Autonomous Robotics and Sensor Integration **(2025),** Onshape CAD Fundamentals **(2022),** CTECS Workplace Readiness Skills **(2023)**
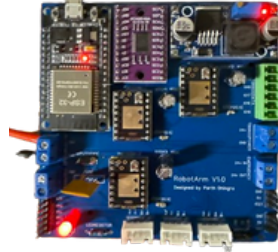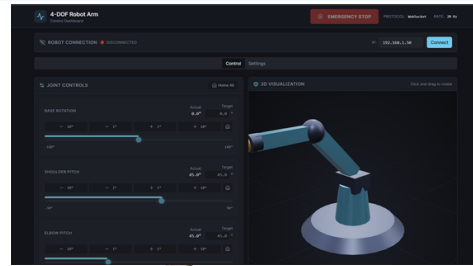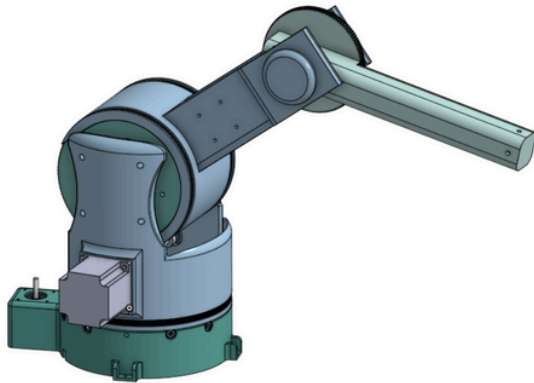
PARTH DHINGRA

MECHANICAL ENGINEERING AT GEORGE MASON UNIVERSITY

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4-DOF ROBOTIC ARM

What?

- Designed and built a 4-DOF robot arm with a **custom PCB**, **stepper motors,** and a **custom web interface**
- Implemented **closed-loop joint positioning** using **absolute encoders** for **accuracy** and **repeatability**
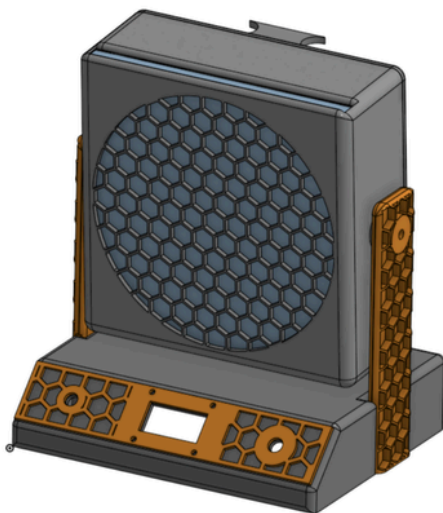
How?

- Designed the mechanical system in **Onshape** and integrated **AS5600 encoders, an ESP32, gearing, TMC2209 drivers** and **stepper motors.**
- Built a real-time WebSocket control interface with live encoder feedback, motion tuning, and safety features

Results

- Achieved stable, repeatable joint positioning without losing accuracy under load
- Created a modular control interface adaptable to future robotic arm designs

SOLDER FUME EXTRACTOR

What?

- Designed and built a compact solder fume extractor that filters out harmful fumes during the soldering process.
- Goal was to create an effective and visually clean unit with high airflow and speed control.

How?

- Designed the mechanical enclosure and airflow path in **Onshape** to maximize **smoke capture efficiency**
- Integrated a high-static-pressure fan and an activated carbon filter
- Designed a **custom PCB** in **EasyEDA** that uses an **Arduino** microcontroller to handle user input and speed control

Results

- Effectively captured solder fumes at the source, improving workstation air quality
- Built a polished, compact hardware system integrating mechanics, electronics, and airflow