

Parth Dhingra

Chantilly, VA | parthdhingra27@gmail.com | 571-464-9571 | linkedin.com/in/parthd27 | U.S. Citizen

Portfolio: parthdhingra.com

Education

University of Maryland — B.S. Mechanical Engineering

Expected May 2029

George Mason University — Mechanical Engineering | GPA: 3.06

August 2025 – May 2026

Skills

CAD: Onshape, SolidWorks, Autodesk Inventor | **Certifications:** SOLIDWORKS CSWA, Onshape CAD Fundamentals

Programming: Python, MATLAB, C/C++ | **Electronics:** ESP32, Arduino, EasyEDA, PCB Design, Soldering

Manufacturing: DFM, Rapid Prototyping, FDM 3D Printing, Sheet Metal Fabrication, Drilling/Tapping, Laser Cutting

Experience

Owner, PD Ventures LLC — Chantilly, VA

January 2023 – Present

- Developed and manufactured functional mounts and holders in Onshape for FDM production, applying DFM principles to optimize wall thickness, snap-fit and screw-mounted interfaces, and print orientation — eliminating support material and reducing print time by ~20%
- Fulfilled 600+ customer orders generating \$8K+ in revenue while maintaining consistent production quality

Head Mechanical Captain, FIRST Robotics Competition Team 612 — Chantilly, VA

August 2023 – May 2025

- Led a 20-member mechanical subteam through Onshape design reviews, subsystem integration, fabrication, and testing to deliver a 120-lb competition robot within a six-week build cycle
- Co-designed drivetrain and shooter mechanisms in Onshape and fabricated components using sheet-metal cutting, drilling on a vertical mill, tapping, riveting, and FDM printing to meet weight and packaging constraints
- Served as pit boss, directing between-match troubleshooting and repairs to minimize mechanical downtime and return the robot to match-ready condition within each match cycle

Team Member, GMU Autonomous Robotics & Sensor Integration — Fairfax, VA

September 2025 – December 2025

- Partnered with a teammate to build an Arduino-based line-following robot, integrating ultrasonic obstacle detection, an IR remote receiver, and a dedicated line-sensor array
- Implemented threshold-based control logic to convert sensor inputs into real-time steering and obstacle-avoidance behavior, then iteratively tested and refined the system before presenting the completed robot

Projects

6-DOF Robotic Arm | Onshape, ESP32, Encoders, Stepper Motors, PCB Design

January 2026 - July 2026

- Designed and built a 500 mm-reach, six-axis robotic arm with a 600 g payload capacity, achieving ~1.5 mm end-effector repeatability across 10 return-to-point trials measured with a dial indicator
- Designed and hand-soldered a custom PCB integrating an ESP32-S3, six TMC2209 stepper drivers, AS5600 absolute encoders, and motor/power interfaces to control all six joints from a single board
- Developed a Bluetooth control interface for wireless multi-axis jogging and live joint-position feedback, implementing encoder-based closed-loop joint control in ESP32 firmware

25:1 Cycloidal Gearbox | Onshape, Mechanical Design, 3D Printing

March 2026 - July 2026

- Designed and prototyped a compact 63 mm-diameter, 25:1 cycloidal reducer in Onshape for the robotic arm, achieving 3.15 N·m measured output torque via a lever-arm load test
- Completed five FDM design iterations to resolve binding and axial compression and reduce backlash to ~0.67°, refining geometry, bearing constraints, and shaft-bore tolerances

Solder Fume Extractor | Onshape, Arduino, PCB Design

November 2025 - December 2025

- Built an FDM-printed solder fume extractor with a high-static-pressure fan and activated-carbon filtration
- Designed a custom Arduino-based PCB with a potentiometer-controlled interface and live fan-speed display, enabling continuous 0–100% fan-speed control