Avyukt P. Iyer

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STEM Portfolio
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Education

Georgia Institute of Technology — Atlanta, GA
B.S. in Mechanical Engineering *— #2 Undergraduate ME Program (U.S. News)* — *May 2029*

- **Relevant Coursework:** Statics, Engineering Graphics and Visualization, Differential Equations, Linear Algebra, Calculus III
- **Activities**: Engineers Without Borders (Nepal Technical Team), Aarohi (Indian Classical Music), GT Roundnet

Projects & Leadership Experience

***ARISE*: Adaptive Robotic Intelligent Support Exoskeleton** | *Inventor, U.S. Patent Pending* — Aug 2024 – Present

- Designed and fabricated a low-cost upper-body exoskeleton for repetitive lifting, with two 13 N·m powered joints, passive shoulder joints, and 25 custom laser-cut structural components
- Integrated EMG, load-cell, pulse-oximeter, and encoder feedback with PIDF control; ran 300+ trials (5 to 15 kg), cut EMG voltage 13%, pulse rate 53.9%, and perceived exertion (RPE) 77%

***VIGIL*: Drone-Guided Smart Glasses for Blind and Low-Vision Users** | *Hardware Lead and Co-Inventor* — Sep 2026

- Designed and 3D-printed CAD mounts in 36 hours, retrofitting off-the-shelf glasses with a camera, ToF sensors, and servos
- Wired and integrated an ESP32-CAM, dual ToF sensors, and SG90 servos for reliable haptic feedback on a moving user

BrainSTEM Robotics (FTC & FRC) | *Mechanical Co-Lead, Outreach Lead, Driver, Mentor* — Aug 2022 – Aug 2026

- Led design for the #2 globally ranked team (40+ awards), delivering 18 robots and 35+ subsystems (bevel-gear differential wrist and 5-DoF end effectors)
- Mentored 20+ teammates and led STEM outreach for disadvantaged Haitian and local communities, raising $12K+ and presenting to 50+ companies; recognized by PA Legislature

Experience

Laboratory for Intelligent Decision and Autonomous Robots (LIDAR) — Oct 2026 – Present
Undergraduate Student Researcher — *Atlanta, GA*

- Developing tactile sensing hardware for Unitree G1 humanoids to navigate hazardous spaces by touch; built and integrated a 384-taxel sensor array with Arduino firmware
- Characterizing sensor noise and drift in Python, identifying ghosting artifacts and designing a force-calibration study to fill a gap in the lab's published calibration

WEAR @ GT (Wearable Exoskeletons & Assistive Robotics) — Sep 2026 – Present
Human Factors Testing & Research Lead — *Atlanta, GA*

- Founded and leading a 15-member human factors research subteam split into mechanical, software, and electrical tracks
- Creating and teaching weekly lessons on exoskeleton design, sensors, actuators, and haptics; members present how each assigned paper applies to our design for a Spring 2027 mock competition

MIT Beaver Works Summer Institute — June 2025 – Aug 2025
Autonomous Underwater Vehicle Student Researcher — *Cambridge, MA*

- Developed a real-time 3D state-estimation algorithm in Python within Blue2ROV's ROS 2 architecture, computing relative x-, y-, z-position and yaw without external sensors
- Trained YOLOv8 models on 3,000+ underwater images to detect BlueROV2 vehicles with 95.2% accuracy on a Raspberry Pi

Technical Skills

Mechanical Design: SolidWorks · Fusion 360 · Onshape · Mechanism Design · Mechatronics · Rapid Prototyping
Manufacturing: Machining (Montgomery Machining Mall, in progress) · 3D Printing · Laser Cutting · CNC Routing
Sensing & Testing: Human-Subject Testing · EMG · Load Cells · Encoders · Sensor Data Analysis · Tactile Sensing
Programming & Electronics: Python · Java · Embedded Programming (Arduino, ESP32) · ROS 2 · PIDF Control · Git

Awards

HackGT 13 – 3rd Place Overall (of 268 Teams) — 2026
FIRST Robotics Competition (FRC) Impact Award – Finalist (Top 8 Worldwide) — 2026
Regeneron International Science and Engineering Fair – Finalist (Biomedical Engineering) — 2025
FIRST Tech Challenge (FTC) European Championship – 1st Place — 2025
FIRST Tech Challenge (FTC) Dean's List – Finalist — 2025
FIRST Tech Challenge (FTC) World Championship – 4th Place (Alliance Captain) & Division Winner — 2023