

# Abhinav Swarup

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## Professional Summary

Aspiring robotics engineer with hands-on expertise in robotic systems, mechanical design, and product development. Founded the University of California's first autonomous humanoid robotics club, Triton Droids, with a focus on advancing real-world robotics applications. A strong track record of launching successful ventures, such as the startup, Unquo HealthTech, - a wearable health-tech solution for women.

## Education

**University of California San Diego**, | *La Jolla, California*

**Sept 2022 – Jun 2026**

Bachelor of Science in Mechanical Engineering with specialization in Controls and Robotics

## Technical Skills

**CAD:** SolidWorks, Fusion 360, AutoCAD, Onshape, FEA (Ansys), CFD, GD&T, FMEA, Tolerance Stack-Up Analysis

**Mechanical:** 3D printing, Laser cutting, CNC machining, Power tools

**Software:** MATLAB, C, Python, Java

**Electrical:** Arduino, Soldering, Circuits, Power supplies

## Experience

**Triton Droids – Humanoid Robot Organization | Founder and President** | *La Jolla, California* **Sept 2024 – Present**

- Launched UCSD's first humanoid robotics club, directing early-stage planning, registration, branding & web-design, recruitment, growing membership to 40+ across multiple disciplines, partnerships with 5+ professors and 3 industry experts.
- Directed Work on 6 DOF robot leg designs using Onshape, focusing on joint design, load analysis, and kinematic simulation for mobility.

**ISGEC Heavy Engineering Ltd | Research and Design Engineer ( Intern)** | *Yamunanagar, India* **Jun 2024 – Sept 2024**

- Conducted stress calculations, geometric dimensioning and tolerancing (GD&T), tolerance analysis, and load analysis using finite element modeling (FEM), along with design optimization in SolidWorks, for a 50-ton load bearing cart gearbox, ensuring compliance with IS, ISO, and DIN standards.
- Developed Python programs, automating computations for beam deflection, stress analysis, shaft sizing, gear design, and AGMA stress calculations, reducing manual calculation time by approximately 50%.
- Oversaw CNC, PEG cutters, and hydraulic machines in metal fabrication, gaining manufacturing experience in the factory.

**Qualcomm Institute | DIB Makerspace Intern** | *La Jolla, California*

**Sept 2023 – Jan 2024**

- Trained and technical oversight for 100+ students on manufacturing and fabrication tools, achieving improved project completions.
- Fabricated a custom heat exchanger clamp with a 70% functionality boost for injection molding machinery.
- Maintained and calibrated infrastructure including: CNC/manual mills, lathes, laser cutters, FDM/Resin 3D printers, injection-moulding machines, electrical equipment, and sheet-metal fabrication tools.

**SEDS | Fluid Systems Engineer** | *La Jolla, California*

**Sept 2022 – Apr 2023**

- Designed and constructed reusable ground support equipment (GSE) to fuel, pressurize, and control LOX and LNG rockets. Created P&ID diagrams and performed FMEA analysis, improving system reliability and testing efficiency during launches.
- Led the sourcing of valves, solenoids, and actuators based on system requirements such as pressure ratings, flow rates, and temperature specifications to optimize vehicle performance and cost, lowering manufacturing expenses by 30%.

**UN|QUO HealthTech | Founder and CEO** | *New Delhi, India*

**Sept 2020 – Sept 2022**

- Invented a patent pending wearable device for maternal health that won the Conrad competition in the health & nutrition category.
- The innovation, validated for a pilot by Dr. Harsh Vardhan, Minister of Health, India, demonstrated a 28% improvement in knowledge of timing of immunization and 20% increase in adherence to IFA supplements among users.

## Projects and Achievements

**Engineered MAE 3 Robot:** As part of *Engineering Graphics and Design at UCSD*: Built an escapement mechanism clock, analysing pendulum frequency using CAD; designed and built a dual-motor scissor lift and flywheel launcher with AutoCAD and laser cutting.

**Winner, HealthLink Hackathon at UCSD:** Developed AI-driven ECMO machine and crafted business plan.

**Invented Self-Heating Lunchbox :** Invented (Patent Pending) a lightweight (336g) self-heating lunchbox powered by a Li-ion battery with a Nichrome wire element, capable of reheating food to 60°C in under 3 minutes; conducted extensive material and ergonomic testing to reduce weight by 15% using PLA and stainless steel, ensuring durability, waterproofing, and incorporating dual compartments.

**Winner, First Robotics Competition:** Won 'Rookie Game Changer Award' in First Robotics for designing, building, and coding an autonomous robot in Java.

**Finalist, National F1 in Schools:** National finalist in the F1 in Schools international competition, conceptualised and designed an aerodynamic car body in Fusion 360 to minimize drag, calculated downforce on front and rear air foils, and used Autodesk Flow Design (CFD software) to achieve a drag coefficient of 0.29; manufactured the car using 3D CAM software and CNC machining.