INDRAAN SINGH

MECHANICAL & PRODUCT DESIGN ENGINEER

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Mechanical Engineer specialising in Product Design Engineering, with hands-on experience turning complex ideas into functional mechanical and electromechanical products. Strong across concept development, CAD, prototyping, testing and DFM, with a focus on engineering products that are practical, manufacturable and built to perform.

Education

University of Glasgow & Glasgow School of Art **2025–2026**

MSc Product Design Engineering

Shiv Nadar University, Delhi NCR, India **2021–2025**

B.Tech Mechanical Engineering

Specialisation: Robotics & Automation | Minor: Design

Mechanical & Product Development Skills

Mechanical Design
SolidWorks, Fusion 360, Parametric CAD, Mechanical Assemblies, Engineering Drawings, GD&T

Prototype & Manufacturing
3D Printing, Rapid Prototyping, Mechanical Assembly, Laser Cutting, CNC Machining, Sheet Metal, Injection Moulding, Extrusion

Electromechanical & Programming
Motor Control, Sensor Integration, Arduino, Raspberry Pi, C++, Python, PID Control, OpenCV

Product Development
Requirements Definition, Concept Development, Mechanical Architecture, Design Iteration, System Integration, DFM/DFA

Testing & Validation
Experimental Design, Mechanical Testing, Prototype Evaluation, Verification & Validation, Simulated-Use Testing

Engineering Documentation
BOM, FMEA, Test Protocols, Validation Records, Technical Reports

Experience

Design Engineering Intern **May 2022–Aug 2022**

Boston Scientific

- Designed and developed mechanical components and 3D CAD assemblies for a robotic guidewire control system used in endoscopic procedures.
- Iterated the mechanical architecture through prototyping, component selection, fabrication, assembly and system integration, resolving fit, packaging and manufacturability constraints.
- Developed and executed simulated-use tests to evaluate precision, functionality and mechanical reliability, using results to refine the design.
- Presented design iterations in multidisciplinary engineering reviews, with the resulting prototype protected under company IP.

Product Design Intern **Jun 2023–Jul 2023**

NCAHT, AssisTech Lab, IIT Delhi (Indian Institute of Technology, Delhi)

- Developed a new mobility cane concept for visually impaired toddlers, improving ergonomics by translating user and caregiver research into engineering requirements and mechanical design decisions.
- Developed the product through concept generation, CAD, rapid prototyping, fabrication, assembly and usability testing, considering ergonomics, reliability, safety and manufacturability.
- Engineered a functional mobility aid at approximately INR 500 (£5), reducing cost by around 85% versus comparable products to support accessibility and suitability for mass-market adoption.

Selected Engineering Projects

ScopeAssist | Improving Endoscope Control Interface

- Conceived and engineered a modular electromechanical attachment for conventional endoscope controls, intended to reduce repetitive thumb actuation while retaining existing equipment and workflows.
- Designed a dual motor-driven transmission architecture, wheel interfaces, motor mounts and component packaging to convert thumbstick input into independent control of two mechanical axes.
- Built and iteratively tested physical prototypes to evaluate transmission behaviour, mechanical integration, packaging and overall feasibility.
- Evaluated prototype form and control movement with practising gastroenterologists, using feedback to guide mechanical and ergonomic development.

Bio-Inspired Autonomous Underwater Vehicle

- Developed a bio-inspired Autonomous Underwater Vehicle (AUV) exploring manta-ray-inspired propulsion as an alternative approach to conventional underwater movement.
- Designed a custom restricted knuckle joint to enable controlled articulation and generate the required propulsion motion.
- Led mechanical development from concept through CAD, fabrication, system integration and experimental testing, delivering a functional prototype with stable underwater propulsion.

Open-Ear Audio System for Turbaned Users

- Developed an open-ear audio concept for turbaned users, addressing the discomfort and poor fit of conventional headphones when worn with a turban.
- Explored alternative ear placement and product form through concept development and CAD, focusing on comfort, secure fit and ease of use.
- Refined the concept around everyday wearability while maintaining the core functionality of a personal audio device.

ASME International Student Design Competition | Water-Powered Robot

- Designed and engineered a robot powered entirely by the potential energy of water, integrating mechanical design, fabrication and system development.
- Achieved 2nd nationally and 7th globally in the international competition.

Leadership

Design Officer, Robotics Society | University of Glasgow Jan 2026–Sept 2026

Leading design and development activities across robotics projects while supporting members in CAD, mechanical design and rapid prototyping.

Associate Secretary, The Design Club | Shiv Nadar University Mar 2023 – Mar 2024

Helped revive and rebuild the Design Club after a period of inactivity, growing it into a 60+ member student community. Led the planning of workshops, design initiatives and collaborative projects, while supporting the club's structure, engagement and day-to-day operations.