Sahil Jambavalikar

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PROFESSIONAL SUMMARY

Mechatronics Engineer Student with a strong foundation in Embedded Systems, IoT Architecture, and Product Development. Proven track record of innovation, demonstrated by consecutive First Place victories at IIT Bombay's RowBoatics competition. Expert in bridging the gap between mechanical design and firmware optimization to deliver high-performance, integrated automated solutions.

TECHNICAL SKILLS

Embedded Systems & IoT: Microcontroller Architecture (ESP32, Arduino), Real-Time Firmware (RTOS), Serial Communication Protocols (I2C/SPI/UART), Wireless Telemetry (ESP-NOW, MQTT), Analog & Digital Sensor Interfacing.

Mechanical & Design: Parametric CAD Modeling, PCB Prototyping & Fabrication, Circuit Analysis, Design for Manufacturing (DFM), Additive Manufacturing (FDM/SLA), Mechanical Assembly Analysis.

Tools & Programming: PCB Prototyping & Fabrication, Circuit Analysis, Embedded C/C++ (Advanced), Python (Scripting), HTML (Basic UI), Arduino IDE, Fusion 360, SolidWorks, KiCad.

EDUCATION

Pursuing
Bachelor of Engineering - **New Horizon Institute of Technology and Management, Thane, Maharashtra**

2022
HSC - **Saraswati Vidyalaya, Thane, Maharashtra**

2020
SSC - **Sri Ma Vidyalaya, Thane, Maharashtra**

EXPERIENCE

September 2024 - PRESENT
Freelance Product Design & Manufacturing *- Founder*

- Established a specialized rapid prototyping service catering to engineering requirements and custom mechanical parts.
- Engineered and manufactured hydro-dynamically optimized propulsion systems for the RowBoatics competition (Techfest, IIIT Bombay), directly resulting in back-to-back championship titles.
- Competencies: Product Lifecycle Management, Client Consultation, Additive Manufacturing.

PROJECTS

6-DOF Wireless Robotic Arm - December 2025

- Designed and fabricated a 6-axis robotic manipulator featuring a custom-built kinematic sequencer for recording and replicating complex motion paths.
- Architected a low-latency Web Interface hosted directly on the microcontroller, enabling real-time teleoperation via WebSockets.
- Currently developing Phase 2: Implementing IMU-based gesture control and utilizing the ESP-NOW protocol to achieve millisecond-latency wireless communication.
- **Tech Stack:** Embedded Firmware (C++), Wireless Communication Protocols, Precision Mechanism Design, WebSockets, Fusion 360.

Interactive Bipedal Robot - September 2025

- Developed a bipedal humanoid robot capable of dynamic gait stabilization and obstacle negotiation.
- Implemented an interactive UI using TFT displays to simulate emotive responses triggered by environmental stimuli and touch inputs.
- **Tech Stack:** Humanoid Robotics, Servo Kinematics, Sensor Fusion, Signal Processing.

IoT Smart Helmet for Accident Detection - October 2023

- Engineered a wearable safety device utilizing accelerometer data to detect high-G impacts and potential accidents.
- Integrated GSM and GPS telematics to execute automated emergency response protocols with precise geolocation data.
- **Tech Stack:** IoT Architecture, Telematics & Geolocation, Low-Power Embedded Systems.

ACHIEVEMENTS & CERTIFICATIONS

1st Place, RowBoatics (Techfest, IIT Bombay) (2024 & 2025) - *Engineered high-efficiency boat for consecutive wins.*

5th Place, Cosmo-Clench (Techfest, IIT Bombay) (2023) - *Built precision pick-and-place robotic system.*

Finalist, Innovation Round - VES-IT Hackathon (2024) - *Prototyped Automated Coin Sorting System.*

Participant, Adobe India Hackathon - Unstop (2025) - *National-level challenge on algorithms & prototyping.*

CERTIFICATIONS & TRAINING

Industrial Training in Robotics & AI - Robo-AI (Oct 2024)

IBM Certified Professional Skills & IT Fundamentals - IBM (March 2024)

Raspberry Pi Workshop - Fundamentals of Embedded Computing (Jan 2025)

Certified Intermediate Robotics Course - Asier Solutions (May 2022)

LANGUAGES

English, Hindi, Marathi (Professional Proficiency)