Shashwat Shah

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Summary

Possessing a strong engineering foundation, I demonstrate practical expertise in robotics, showcasing adept problem-solving skills and proficiency in relevant programming languages. Fueled by a keen interest in innovating within robotics, I bring effective communication and collaborative skills, enabling seamless teamwork. My early passion for robotics, evidenced by crafting miniature robots during school and college, reflects a sustained commitment to the field and a proactive aptitude for practical applications.

Education

Nirma University Ahmedabad, Gujarat, India

Major in Electronics and Instrumentation *2021-2025*

- Relevant Coursework: Analog-Digital Electronics, Microcontrollers and Microprocessors, Instrumentation and Control Systems, Industrial Automation, Mobile Robotics, Machine Learning
- Key Projects: 3d printed six-axis Robotic Arm, Aqua Gardner, Robotic Vending Machine, solar-powered Smart Water Level Indicator with Predictive Alerts, Autocut For Manual Stabilizer, Vision-based gesture-controlled car

Minor in Robotics2023-2025

- Gained practical exposure to robotic arm control, mobile robot navigation, and sensor-actuator interfacing, reinforcing theoretical learning through real-world prototyping and simulation tools.
- covering core areas such as robotic kinematics, industrial automation, and embedded system integration, with hands-on labs and interdisciplinary project work.

Experience

Archtech Automation January 2025 - April 2025

Robotics and Factory Automation Intern *Ahmedabad, India*

- Designed and built a custom 3-axis gantry robot that was fully autonomous and integrated with the injection molding machine to reduce the removal cycle to 13 seconds with precision motion control and IoT sensors that dynamically synchronized in real-time. motion programs and smart decision logic in Trio Motion Perfect to coordinate multi-axis motion, optimize timing through machine learning, and predict faults using AI to improve system reliability.
- Created a fully functional industrial control panel with integrated IoT architecture, including transformer 15 kVA, EtherCAT servo drives, safety interlocks, and sensor-actuator feedback loops to enable intelligent automation and remote diagnostics.

University of North Texas May 2024 - July 2024

Remote Research Intern *Austin, USA*

- Worked on Mental Health monitoring using smartphone Data and Multiple Sensors data
- Worked on multiple past Machine Learning Models to enhance the accuracy from 46.8 to 57.3

Adiance Technologies Ahmedabad April 2024-August 2024

Robotics Research Intern *Ahmedabad , India*

- developed a fully 3D printed 6-axis robotic arm, programmed the control system and successfully assembled CCTV camera components also Ensured optimal printer performance through routine maintenance, troubleshooting, and calibration.

Simplyfy Solutions Jun 23 – Nov 23

Machine Learning intern Jun 23 – Nov 23 *Los Angeles, USA*

- Leveraged image processing and ML to optimize database sorting. Developed innovative virtual body measurement algorithms for new hardware products.

Institute of Technology, Nirma University May 23 – Sep 23

Research student *Ahmedabad, India*

- Introduced a dual short-wave NIR-based non-invasive based glucoese and cloestrol by feeding into ML model implemented on Arduino based low cost approximately 20-25 USD device iGLU for CGM. The error margins for iGLU are improved compared to other noninvasive systems. This research is done under Dr Pratik Jain

PATENT and PAPER Publication

AquaGardner: Automatic Grass Cutting and Water Sprinkling Robot [PATENT] 2025

- Application No.202521032507 A, **Status: Published – Intellectual Property India, Publication Date: 18/04/2025** Inventors: Shashwat Shah, Urja Shah Mentors: Dr. H.K. Patel, Prof. Sand ip Mehta Description: Co-invented an autonomous robotic system for smart gardening that integrates image processing, AI-based obstacle avoidance, and precision water management. The robot automates grass detection, cutting, and sprinkling, improving lawn care efficiency while supporting eco-friendly practices.

QuickBite: A Versatile Robotic Food Vending Machine for Smart Food Industries 2024

- Published Research in Vending Machine Technology: Co-authored a research paper published in the Journal of Technology, focusing on the design and development of an innovative robotic vending machine. This project, under the guidance of Dr. Himanshu K. Patel, HOD of Electronics and Instrumentation Engineering, addresses the limitations of traditional vending machines and explores the potential of advanced robotic technology in the food service industry. DOI:18.15001/JOT.2024/V12I8.24.611

Awards

Winner, Idea lab projects | *Nirma University* 2024

- My Idea and prototype built under the program IDEALAB got 1st position for creating a self-garden maintaining robot, and through a project grant of 70,000 INR

Idea lab project grant FY 2024 | *Nirma University*

- Awarded a 70k INR grant under the Idealab program to develop a prototype of a self-sustaining garden maintenance robot, demonstrating innovative problem-solving and technological expertise.

8th Place in All India Automation Games 2024 | *NMIMS University* 2024

- received 8th place by competing in multiple competition of automation and robotics in India Automation Games

Winner, Avishkar competition 2019 | *St. Kabir School* 2019

- School robotics competition where we received 1st prize for developing 'Schoobie' stationery and books transporter accros school

Projects

FlexTalk – AI-based Sign Language Translation Glove | *Paper Publication In-Progress*

- Developed a wearable smart glove that translates Indian Sign Language into text using flex sensors and machine learning algorithms. Created a custom gesture dataset, implemented real-time gesture classification using a decision tree model, and integrated dual LCD output with Bluetooth for assistive communication. The system enables non-verbal individuals to interact effectively using AI-powered interpretation.

3d Printed Robotic Arm |

- — It is a light weighted 3d printed robotic arm which is 3M in length and built on design of BCN3D, which is six axis robotic arm used for assembling miniature parts and other application such as pick and place, machine assembly task such as screwing, material Hand ling etc

AquaGardner | *Patent Published*

- The ultimate autonomous field manager constructed with a fully 3D printed Caterpillar track.Capable of recognizing the height of grass and identifying obstacles. It can map the entire field using Visual Slam technology, establishing a pathway for watering and lawn leveling tasks, thereby minimizing human labor in garden maintenance.

Quick Bite Vending Machine | *Paper Published*

- A vending machine capable of cooking 3 Indian meals with 6 DOF robotic Arm which has Object recognition and localisation features with Motion, grasp planning and Collision-free robotic arm movement for device safety and movement.

Mental Health Monitoring Using Smartphone App Data |

- Under the guidance of **Dr. Saraju P. Mohanty** and **Dr. Anand Bapatla**, led a research project to explore the potential of smartphone app data for mental health monitoring. By analyzing various data points and applying advanced machine learning techniques, this research aimed to develop accurate predictive models for early detection of mental health issues

IGLU 3.0 | *Paper Publication In-Progress*

- A noninvasive glucose measurement tool made by using NIR based short waves. This research is done under **Dr Pratik Jain**

Schoobie |

- Automated Stationery Delivery Robot: Developed a robotic solution for efficient and autonomous delivery of stationery and books within a school setting, improving operational efficiency and student experience.

Extra Curricular Activities

President, International Society Of Automation Chapter Nirma University | *Nirma University* Jan 24- Dec 24

- Leadership and Management role which includes Team Building, Delegation and Empowerment, Conflict Resolution and events and initiatives like Technical Workshops and Seminars, Competitions and 24-hour Robotic and Automation Hackathons, Networking Events, Management of the biggest Chapter with High budget events with self-generated funds through various sponsorship campaigns

Joint Secretary,ISA ITNU | *Nirma University* Jan 23- Dec 23

- Managed logistical operations, including venue bookings, permission acquisition, and meeting minute-keeping, ensuring smooth execution of chapter activities and events.

Technical Director, Invincible Leader's Club | *Nirma University* Jan 24- Dec 24

- Led technical strategy, team development, and event execution, driving innovation and achieving organizational goals , Hosting Tech Talks with Top Luminaries of the country

Technical Skills

Core Technical and Robotics Skills: Robotics Design and Prototyping, Deep Learning (for Gesture and Object Recognition), Trajectory Planning, ROS (basic), Python, C++, MATLAB, Embedded Systems (Arduino, Jetson Nano, Raspberry Pi), Control Systems (Ladder Logic, SCADA), Sensor Fusion, IoT-based Automation, LabVIEW

Programming and Control Systems: Python, , C/C++ , MATLAB and Simulink , Ladder Logic and SCADA , ROS Basic

Embedded Systems and Hardware: Embedded Systems: Arduino, ESP32, Jetson Nano, Raspberry Pi, PIC Microcontroller, IoT-Based Robotics Solutions, Real-Time Sensor Integration and Actuation

Research and Academic Strength: Academic Research Writing, Prototyping and Experimental Design, Technical Paper Publication and Patent Filing Experience, Data Analysis and Experimentation for Robotics Use-Cases

Teaching and Collaboration Skills : Clear Technical Communication, Leadership and Team Management, Workshop/Tech Talk Experience, Mentoring Juniors or Conducting Lab Sessions