Saniya Patwardhan

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Eligible for Graduate Worker Route (GWR) visa in UK for two years after graduation

Profile

Robotics researcher with experience in embodied AI, robot control, and multimodal learning. Skilled in Python, C++, and ROS, with projects spanning human–robot collaboration and autonomous navigation.

Education

2025 – present **MRes Design Engineering (Robot Intelligence Lab)** ongoing
Imperial College London
India Future Leaders Scholarship 2025

2020 – 2024 **B.Tech in Mechanical Engineering (Minor in Robotics)** GPA: 8.75/10
Indian Institute of Technology Gandhinagar
Director's Silver Medal for Outstanding Overall Performance

Work Experience

Technical Operations Associate, Director's office (Part-time) Sep 2025-Present
Miacarla Limited, London
– Implement AI automation and optimize spreadsheet workflows to improve office efficiency.
– Support and manage the company's social media presence and digital operations

Robotics and AI Reverse Mentor for Senior Leadership Jul 2025 - Aug 2025
Hindustan Petroleum Corporation Limited, HQO
– Advised members from the board of directors of a major Indian oil and gas PSU on integrating Robotics and AI into operations and strategy.
– Delivered tailored tech briefings and POC studies on robotics and computer vision for industrial maintenance and inspection.

Robotics Researcher, Multi-object Grasping Project Aug 2024 - Jul 2025
IITGN Robotics Lab — Sabarmati Bridge Fellowship
– Pioneered an underexplored research direction on multi-object manipulation using multi-fingered, multi-DOF robotic hands, emphasizing planning and coordinated execution.
– Determined the optimal object picking order to maximize in-hand finger workspace, computed using reachability maps, for efficient multi-object grasping.
– Trained a Multi-Output Gradient Boosting Regression (MOGBR) model to predict finger workspaces for grasping sequences of unknown objects.

Research Intern, Active Robot Vision Project May 2023 - Jul 2023
University of Washington, Seattle (USA)
– Improved object recognition scores in cluttered scenes with occluded objects by enabling a mobile robot to predict and move to the next-best view using an extremum seeking controller.
– Implemented the pipeline using ROS Kinetic on NVVIDIA Jetson AGX Orin with Intel Realsense, incorporating a 3D point-cloud-slicing-based topological descriptor for object recognition.

Research Intern, Quadruped Robot Stance Stability Project May 2022 - Jul 2022

Indian Institute of Technology Delhi

– Designed a real-time control framework for a quadruped robot using centroidal dynamics and momentum-based control to reject external disturbances.

– Simulated and validated control performance under varying load and terrain conditions using MAT LAB/Simulink.

Projects

Human-Robot Collaboration through VLA-based Learning *Sep 2025 – Present*

Robot Intelligence Lab, Imperial College London

– Developing a Vision–Language–Action based learning framework for Robot DE NIRO to enable contact-rich, human–robot collaborative manipulation tasks.

– Integrating multimodal perception, intention prediction, and adaptive real-time planning to enhance the naturalness and efficiency of collaboration.

GalPal.ai — Context Aware Local LLM-Powered Wellbeing Assistant *Sep 2025 – Dec 2025*

Sensing and IOT 2025-26, Imperial College London

[Video Demo] — [Github Repo]

– Developed a privacy-preserving, local LLM–powered assistant integrated with an iPad to analyze handwritten journal entries, infer user mood, and store structured insights in a SQLite database for Retrival Augmented Generated journal insights.

– Implemented a context-aware outfit recommendation pipeline that combines real-time weather data, inferred emotional state from journal analysis, and a self-curated, annotated personal wardrobe dataset.

Autonomous Campus Shuttle *Aug 2023 – May 2024*

Indian Institute of Technology Gandhinagar

[Video Demo] — [News Article]

– Converted an electric vehicle into an autonomous intra-campus shuttle with lane-following and obstacle detection capabilities to ensure safe and centered navigation.

– Designed and actuated control systems for braking, acceleration, and steering, integrating a closed-loop feedback system using Pixhawk, RGB-D cameras, and LiDAR sensors for autonomous and remote operation.

Achievements

– **India Future Leaders Scholarship, Imperial College London:** Awarded GBP 10,000 towards tuition fees; one of only 10 recipients selected from the entire Indian student cohort at Imperial.

– **Student Travel Grant for ICRA 2024:** Received USD 1,000 from the Mobile Manipulation TC and Robot Learning TC to attend ICRA 2024 and participate in the 2nd Workshop on Mobile Manipulation and Embodied Intelligence.

– **Sabarmati Bridge Fellowship, IIT Gandhinagar:** Awarded a year-long fellowship to conduct full-time research at the IITGN Robotics Lab as a Predoctoral Researcher (2024–25).

– **Director's Silver Medal:** Honored for outstanding overall performance at the 13th Convocation Ceremony of IIT Gandhinagar.

– **UW Mechanical Engineering Summer Research Grant:** Received USD 5,700 to pursue a 10-week research internship at the University of Washington, Seattle.

– **MITACS Globalink Research Internship:** Selected for a fully funded summer research internship at Queen's University, Canada.

– **Dean's List, IIT Gandhinagar:** Recognized for consistent academic excellence.

– **Excellence Scholarship in Sports, IIT Gandhinagar:** Awarded for outstanding performance in inter-college and intra-college sports leagues.

Publications

- **S. Patwardhan**, A. Ansari, A. Krishna, H. J. Palanthandalam-Madapusi. *"Grasp Sequence Planning for Multi-object Grasping using Reachability Maps."* Presented at *Advances in Robotics 2025*, 7th International Conference of the Robotics Society. [In print]
- V. K. Jonnalagadda, C. K. Mullapudi, **S. Patwardhan**, E. U. Samani, and A. G. Banerjee. *"Extremum-Seeking Active Object Recognition in Clutter Using Topological Descriptors."* Presented at *IEEE International Conference on Robotics and Automation (ICRA 2024)*, PACIFICO Yokohama: 2nd Workshop on Mobile Manipulation and Embodied Intelligence. [Link]
- A. Dan, **S. Patwardhan**, S. K. Saha, and K. RamaKrishna. *"A Novel Control Strategy for Stance Stability of a Quadruped Robot against External Disturbance."* Presented at *Advances in Robotics 2023*, 6th International Conference of the Robotics Society. [Link]
- **S. Patwardhan**, A. Dan, S. K. Saha, and K. RamaKrishna. *"Simscape Modelling of Quadruped Robot under External Disturbance."* Poster presented at *IPRoMM 2022 – 2nd International and 14th National Conference on Industrial Problems on Machines and Mechanisms.* [Link]

Extra-Curricular Activities & Positions of Responsibility

- **Captain, Women's Basketball Team, IIT Gandhinagar (2022–2024):** Led the institute's basketball team at the 55th and 56th Inter-IIT Sports Meet; organized training sessions and fostered team spirit.
- **Secretary, StepUp – The Dance Club of IIT Gandhinagar (2021–2022):** Coordinated events, choreographed performances, and managed rehearsals for inter-college competitions, building a vibrant dance community.
- **Core Committee Member & Marketing Head, Blithchron '22 – Annual Cultural Festival (2022):** Directed a 120-member team to execute IIT Gandhinagar's flagship cultural fest; managed marketing strategies and sponsorships.
- **Core Team Member, Mean Mechanics – The Robotics Club (2021–2022):** Organized workshops on Arduino IDE and OpenCV; mentored junior members on basic robotics and coding.

Technical Skills

Programming & Frameworks:	Python, C++, MATLAB, ROS 1 & 2, Arduino, Bash, CMake, OpenCV, Pytorch, Tensorflow
Tools:	Mujoco, Gazebo, RViz, MoveIt, Simulink, Docker, Git, Jupyter
Prototyping:	CAD Modelling, 3D Printing, Laser Cutting, CNC Machining, Laser Cutting, CNC Machining, Lathe, Welding