

Swapneel Bhatt

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EDUCATION

Columbia University in the City of New York, USA

Aug 2024 - Dec 2025

M.S. in Mechanical Engineering, Robotics and Control Concentration

Coursework: Probabilistic Robotics, Reinforcement Learning, Applied Robotics, Model Predictive Control, Modern Controls, Data Science

Nanyang Technological University, SGP

Aug 2018 - Jun 2022

B.Eng. in Mechanical Engineering, Mechatronics and Robotics Specialization

Relevant courses: Intro. to Robotics, Machine Vision, Mechatronics System Design, Theory of Mechanisms, CAD/CAM

PROFESSIONAL EXPERIENCE

Hyundai Motor Group Innovation Centre, Singapore, SGP

Mar 2026 - Present

Robotic Manipulator Engineer, Core R&D Lab

- Design and implement end-to-end robot manipulation algorithms for automated vehicle part assembly and logistics.
- Integrate industrial machine vision systems and multi-sensor setups (3D cameras, vision pipelines) to enable robust pose estimation and robotic part picking using industrial robotic arms.
- Develop imitation learning policies for autonomous trajectory generation and dexterous part manipulation for advanced R&D projects.

Augmentus, Singapore, SGP

Jul 2022 - Jul 2024

Robotics & Application Engineer

- Developed C# code for a no-code robotics platform for robot operators to reduce up to 73% in engineering costs for clients.
- Engineered robot kinematics and motion planning solvers to execute over 5 different robotic manufacturing processes.
- Spearheaded robotic deployment at customer sites for welding, spraying, and sandblasting applications for major customers

Bosch, Singapore, SGP

Jan 2021 - Dec 2021

Corporate Research Intern (Robotics)

- Programmed industrial robot arm motion for development of a novel automated plastic-waste sorting system for SEA markets.
- Created a digital twin on ROS for an ABB robotic arm and supporting mechatronic systems on a conveyor belt.
- Integrated ABB programs and digital twin with a Vision AI-based plastic waste sorting system to increase productivity by 60%.
- Organized regular research progress presentations to Bosch Corporate Research Scientists and management.

PROJECTS

Extended Kalman Filter SLAM for Landmark-Based Navigation- Probabilistic Robotics Project, Columbia University

Oct - Dec 2025

- Implemented the Extended Kalman Filter SLAM algorithm (Thrun's Probabilistic Robotics) as a ROS2 package for online simultaneous localization and mapping with known data association on a TurtleBot3.
- Designed the full state vector and covariance architecture (robot pose, landmark positions, cross-covariances) and built the prediction/measurement-update pipeline using range-bearing observations from corner detection on colored cylindrical landmarks.

Mini Bi-Manual, Research Project - ROAM Lab, Columbia University

Jan - Sept 2025

- Developing Mini Bi-Manual, a miniature bi-fingered end effector for improved robot dexterity under supervision of Prof. Matei Ciocarlie and the ROAM Lab research group.
- Conducting kinematic analysis and optimization of end effector design using ROS2 to maximize workspace utilization and end effector finger performance.
- Published at ICRA 2026: roamlab.github.io/minibee

Bipedal Walking Robot- Robotics Studio Project, Columbia University

Sep - Dec 2024

- Designed, fabricated, assembled, and programmed a bipedal walking robot from scratch with a teammate.
- Performed kinematic analysis of bipedal walking gait for the robot using keyframing from CAD software and fourier transform function smoothening.
- Achieved a final robot walking speed of 10.4 cm/s.

SKILLS

Technical: ROS2, Python, OpenCV, ABB RAPID, URScript, C#, Unity, SolidWorks, AutoCAD

Spoken Languages: Fluent in English and Hindi; elementary German (A2 Certified)