

Sakshi Bhatia

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PROFILE SUMMARY

I build manipulation systems that work on objects not seen before. My research couples foundation models with diffusion policies to achieve zero-shot generalization. I work across the full stack; building simulators, policy learning, and real robots.

EDUCATION

Northeastern University, Boston, MA

MS Robotics (Computer Vision, Reinforcement Learning, Geometrical Deep Learning)

Sept 2024 – May 2026

GPA: 3.88/4.0

National Institute of Technology, Jalandhar, India

Bachelor of Technology (Soft Computing, Mechatronics)

Aug 2018 – May 2022

GPA: 8.09/10

RESEARCH EXPERIENCE

Research Assistant, Dr. Robert Platt, NEU

Feb 2025 – Present

- Reproduced **Diffusion Policy** on RoboMimic and RoboCasa, built a GELLO from scratch for data collection on **UR5** arm.
- Designed a vision encoder for Diffusion Policy improving **OOD** generalization by **12.4%** on Robomimic Lift with unseen objects; improves PushT success by **11%**. Investigated various architectures and foundational models for policy learning.
- Built RoboMimic2D, an open-source Gymnasium-based **2D manipulation benchmark** with physics-based grasping, a gripper state machine, and zarr-backed replay buffer for imitation learning data collection.

Research Intern, Dr. Anupam Yadav, NIT Jalandhar

July 2021 – Oct 2021

- Developed a **Python package** for 'Artificial Electric Field', a novel optimization algorithm, published as a pip-installable.
- Converges to global minima/maxima for multi-dimensional, non-linear problems, while visualizing convergence plots in 2D.

PUBLICATIONS

Enhancing Diffusion Policy Generalization through Structured Visual Representations (First Author, In Prep)

- Proposed a novel vision encoder trained under BC loss that improves OOD generalization by 12.4% across 12 unseen YCB objects. Integrates frozen SAM3 at inference for zero-shot segmentation without fine-tuning compute.

Fuzzy-based techniques for clustering in wireless sensor networks, Wiley

July 2023

- A review study published in International Journal of Communication Systems, <https://doi.org/10.1002/dac.5583>

WORK EXPERIENCE

Teaching Assistant, EECE department, Northeastern University

Sep 2025 – Dec 2025

- Facilitated instruction for EECE5550: Mobile Robotics with Prof. Derya; graded assignments, conducted quizzes, and held office hours covering perception, localization, and control algorithms.
- Assembled and deployed TurtleBot3 Burger robots, configuring, integrating, and testing hardware and software components.

AI Product Analyst, Sprinklr, India

July 2022 – Jan 2023

- Deployed a regex solution to automate harmful content removal on **200+** social channels, reducing manual work by **93%**.

PROJECTS

No reward long-horizon planning using latent world models

Nov 2025

- Implemented the Intrinsic Curiosity Module (ICM) with Deep Q-Network (DQN) for sparse environments.
- Achieved an increase in success rate by **75%** over vanilla DQN on sparse-reward long-horizon tasks.

Augmented Reality C++ Pipeline

March 2026

- Developed an Augmented Reality application in C++ with real-time **3D spatial overlays** and dynamic camera calibration.
- Architected markerless target tracking through ORB matching and RANSAC homography, enhancing AR stability.
- Integrated an **OpenGL/GLFW rendering pipeline** to overlay shaded **3D geometry** onto live video streams.

ACHIEVEMENTS

Best Android XR App with Gemini Live API Runner-up, by Google DeepMind – At MIT Reality Hack 2026

GATE Data Science and Artificial Intelligence: All India Rank 1243 / 39210 (**96.83 %ile**), by IISc Bengaluru 2024

Cleared Post Baccalaureate Fellowship at Robert Bosch's Centre for Data Science and AI- by IIT Madras 2023

SKILLS

Languages: Python, C++, SQL, MATLAB, Bash **Tools**: Git, Linux, NumPy, zarr

Robot Learning: Diffusion Policy, imitation learning, behavior cloning, reinforcement learning, vision-language-action (VLA) models, sim-to-real transfer, teleoperation **ML Frameworks**: PyTorch, TensorFlow, Diffusers, Transformers, Weights & Biases, CUDA, Docker **Vision**: OpenCV, SAM / SAM3, DINO, Grounded SAM, DepthPro, VLMs, diffusion models **Simulation & Robotics**: MuJoCo, RoboSuite, Robomimic, RoboCasa, Isaac Sim, Gymnasium, CARLA, Pymunk, Pygame, ROS / ROS 2