Udit Ekansh

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https://udit176.github.io/

Education

Purdue University, USA - MS in Autonomy — Aug 2024 – May 2026
- GPA: 3.78/4.0

MIT Art, Design, and Technology University, India - B. Tech in Mechatronics and Automation Engineering — Jul 2019 – May 2023
- **GPA:** 8.2/10

Research Experience

Independent Study, SCALE Robotics Lab, Purdue – West Lafayette, Indiana — Sep 2025 – Present.
Advisor: Prof. Rohan Paleja
- Developing a cognitive-state-aware Learning from Demonstration framework that infers latent user intent and assistance requirements using probabilistic modeling and policy learning.
- Using caregiver interviews and real-world demonstrations to personalize assistive-robot behaviors to an individual's functional needs.

Independent Study, TRACE Lab, Purdue – West Lafayette, Indiana — Aug 2025 – Present.
Advisor: Prof. Yan Gu
- Implementing a multiview 3D pose estimation pipeline using calibrated cameras and geometric triangulation to reconstruct accurate kinematic data.
- Building the perception backbone that will support upcoming human–human interaction studies in the lab, including analysis of coordination and physical engagement.

Independent Study, Purdue Digital Twin Lab, Purdue – West Lafayette, Indiana — Jan 2025 – May 2025.
Advisor: Prof. Ziran Wang
- Developed a multi-agent navigation strategy where car-like robots share state, intent, and admissible motion set information via V2V communication, enabling joint optimization of conflict-free reference points using local sensing only.
- Demonstrated how integrating shared feasible-region information improves coordination efficiency, reduces deadlocks, and enables more reliable multi-robot operation in simulated environments.

Research Assistant, Indian Institute of Technology, Bombay – India — Jul 2023 – Jul 2024.
Advisor: Prof. Leena Vachhani
- Developed an integrated underwater planning and control strategy by integrating real-time SONAR perception with a feedback-based motion planner for the RexROV platform.
- Improved reliable operation in cluttered, uncertain marine environments by enabling more stable, efficient, and failure-resistant vehicle maneuvering.

Industry Experience

Research Intern: Decentralized Consensus Algorithms, Tanya Corporation – Portland, Oregon — Jun 2025 – Sep 2025.
- Built a production-ready prototype on Tendermint by designing an optimized data pipeline with async writes, caching, and batch commits, then stress-testing it with large synthetic workloads.
- Achieved a 40% reduction in query latency and sustained throughput of 39 transactions/second with ∼99% reliability under normal load.

Research Intern, TATA Power – Bombay, India — Mar 2023 – Jun 2023.
- Evaluated robotics applications in power-sector operations by benchmarking available technologies on cost, deployment time, and reliability.
- Delivered actionable R&D recommendations by mapping automation opportunities across three key operational workflows and prioritizing those with the highest expected impact.

Publications

- **Instantaneous Planning, Control and Safety for Navigation in Unknown Underwater Spaces**
  J. Veejay Karthik, Udit Ekansh, Tejal Bedmutha, Shivam Vishwakarma, Rohan Deshpande, Leena Vachhani
  (Under review.)

Highlighted Projects & Relevant Coursework

ROS-Integrated Bipedal Robot Design & Control – Capstone Project — Spring 2023, India
Comparing Offline RL in grid-world Navigation – Reinforcement Learning (ECE 59500) — Fall 2024, Purdue
Autonomous Mapping and Navigation with TurtleBot3 –Autonomous Systems (ME 59700) — Fall 2024, Purdue
Evaluating Causal RL Under Structured Distribution Shifts – Statistical Machine Learning (CS 57800) — Spring 2025, Purdue
Real-Time Inverted Pendulum Control on STM32 – Microprocessors and Microcontrollers (ME 58600) — Fall 2025, Purdue

Volunteering Experience

Educational Ambassador, CARE (Center for Advocacy, Response and Education), Purdue – West Lafayette, Indiana — Jun 2025 – Present

- Partnered with CARE to lead peer education sessions and outreach events focused on boundaries, accountability, and respectful conduct, fostering safer spaces and increasing engagement in violence prevention initiatives across campus.

Cultural Exchange and Business Development Manager, AIESEC – Pune, India — Feb 2020 – Jan 2021

- Led outreach and logistics for AIESEC's international internship and event initiatives, securing 5+ local sponsorships & ticketing partners, and managing hybrid event operations to support over 100 student participants.

Certifications and Skills

- **Robotics and Simulation:** ROS, ROS2, Simulink.
- **Programming Languages:** Python, MATLAB, C
- **Machine Learning and Data Tools:** PyTorch, numpy, pandas, scikit-learn, matplotlib
- **Software Utilities:** Linux, LaTeX, Git, MS Office
- **Certifications:** Machine Learning - Stanford University (Coursera), MATLAB Onramp - MathWorks, What is Data Science? - IBM (Coursera)