Mohit Yadav

Minneapolis, MN

763-913-7263 yadav171@umn.edu Portfolio GitHub linkedin.com/in/mohitydv09

EDUCATION

University of Minnesota Twin Cities — Expected Graduation: Spring 2025
MS Robotics, CGPA: 4.0/4.0

Indian Institute of Technology (IIT) BHU Varanasi — 2018
BTech Mechanical Engineering, CGPA: 7.2/10.0

Coursework: Intelligent Robotic Systems, Deep Learning, Computer Vision, Machine Learning, Natural Language Processing

RELEVANT PROJECTS

Bimanual Manipulation using Imitation Learning | **Diffusion Policy, PyTorch, ROS**

- Implemented diffusion policy-based neural network in PyTorch to teach real bimanual robot bottle grasping & uncorking task, using Teleoperation and ROS for data collection. Achieved 74.6% task completion rate, receiving highest grade in class.

Grasping of Dynamic Object under Dynamic Scenarios | **Path Planning, Visual Servoing**

- Designed module for tracking and grasping dynamic objects while avoiding collisions. Employed ArUco markers for object localization, vector-accelerated motion planning for motion generation, and Real-Time Data Exchange for motion execution.

Human Pose Imitation on Baxter Robot | **Robot Middleware, 3D Math, PID Control**

- Created a real-time human pose imitating Baxter robot in simulation. Utilized human pose estimation, 3D math, and PID controls to extract and map human actions onto robot. Deployed a live demo website with a 4.75/5 user satisfaction score.

3D Reconstruction from Stereo Images | **3D Reconstruction, Epipolar Geometry**

- Coded complete pipeline for 3D reconstruction using stereo images from scratch including computation of camera pose using SIFT descriptor, image rectification and disparity map construction.

Scene Description for Visually Impaired | **NLP, LangChain, System Design, Object Detection**

- Designed system to assist visually impaired users in navigation. Used LiDAR camera for input, YOLO for object detection, and an LLM to parse object location information. Achieved 81.4% net preference score over baseline VLM.

EXPERIENCE

Research Assistant | Robotics: Perception and Manipulation Lab, University of Minnesota — 2024 - Present

- Implemented collision avoidance module for dual UR5e robot arms teleoperation system. Used Collision-Affording Point Trees for collision checking with other arm and fixed environment. Reduced frequency of emergency stops by 93.1%.
- Designed pipeline to disassemble multi-part object using bimanual robot. Implemented segmentation guided grasping module for generating 6-DOF grasp pose over desired object part, utilizing Segment Anything Model(SAM) and Contact-GraspNet. Performed perspective transformation calculation to apply grasp pose in simulation.

Teaching Assistant | University of Minnesota — 2024 - Present

- Department of Computer Science & Engineering: Assisted 60+ students with assignments on robotics topics such as 3D transformations, robot kinematics, path planning, sampling-based planning, motion control, and finite state machines.
- Carlson School of Management: Tutored class of 45+ students in writing Python code to implement financial and statistical data analysis concepts, such as portfolio optimization, Monte Carlo simulation, and trading strategy backtesting.

Scientific Officer | NPCIL, India — 2021 - 2023

- Developed 106 technical drawings and 18 design calculation documents, leading the design of fuel transfer machine.

Engineer | TATA Motors Limited, India — 2018 - 2019

SKILLS AND CERTIFICATES

Programming Languages: Python, C++, JavaScript, MATLAB
Tools/Libraries: Git/GitHub, Linux, Docker, PyTorch, OpenCV, Rerun, W&B, PyBullet
Interests: Robotics Perception and Manipulation, Path Planning, Motion Planning, Autonomous Vehicle
Certificates: Algorithms | Data Structures | Machine Learning | Deep Learning | OOP | Self-Driving Cars