

Pranay Junare

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*Seeking internship opportunities for Summer & Fall 2025.

Education

University of Minnesota - Twin Cities

M.S. in Robotics (Courses-Machine Learning, Deep Learning, Robot Vision), GPA: 3.9/4

Minneapolis, MN

Aug 2024 – Present

College of Engineering Pune (COEP)

B.Tech. Electronics and Telecommunication, 2nd degree in Computer Science; GPA: 8.54/10

Pune, India

Aug 2018 – June 2022

Technical Skills

Programming Languages: C++, C, Python, Java

Frameworks and Tools: PyTorch, TensorRT, Tensorboard, OpenCV, Databases (Oracle, MS-SQL), AWS, ML libraries (Scikit-Learn, Numpy, Pandas, etc.), C++ Boost, STL, ROS/ROS2, PCL, MATLAB, Altium PCB Designer, MavROS, PX4, Gazebo, Unreal Engine, Airsim, OpenAI gym, Softgym

Hardware & Developer Tools: Cameras, LiDAR, STM32, Jetson Orin, Linux, LaTeX, CMake, Git, Docker, Jenkins

Research & Industrial Experience

Research Assistant

Sept 2024 – Present

University of Minnesota

Minneapolis, USA

- Currently working on multiview 3D reconstruction of smoke plume using Gaussian Splatting and NeRFs.
- Developing vision-based algorithms for autonomous UAV swarm navigation in challenging sparse feature-less environments.

Software Developer

June 2022 – Aug 2024

ION Trading

Pune, India

- Responsible for design, development and enhancement of low-latency C++ based “Trade & Risk Management” product of ION’s WallStreet Suite treasury solution, which serves most Central banks and major Fortune-100 companies.
- Built static-data configuration tool optimizing initial setup time by 4x and collaborated on end-to-end development of Derivates Reporting Solution utilized by 20+ high-value trading firms/central banks.

Research Intern - NTU-India Connect Research Fellowship

June 2021 – Aug 2021

Nanyang Technological University, Singapore

Nanyang Avenue, Singapore

- Developed a Collaborative UAV-UGV system for Search and Rescue Task, implementing a Octomap based 3-D mapping approach using UAV which can further be used by UGV for navigation. (Advisor: [Dr. Xie Ming](#))
- Built a human rescue detection system on the UAV using Yolo-tiny trained model and achieved an mAP score of 0.89.

Research Intern

Apr 2021 – June 2021

Ontario Tech University, Canada

Oshawa, Canada

- Worked on Autonomous electric wheelchair for children with physical disability. (Advisor: [Dr. Scott Nokleby](#))
- Architected complete navigation stack, evaluated RTABMap and Octomap for 3D mapping, and developed a robust system to detect negative obstacles like staircases, enhancing robot’s autonomy and safety.

Undergraduate Research Member

Mar 2019 – June 2022

Centralized Robotics and Automation Lab, COEP

Pune, India

- Published 3 research papers, won 4 robotics competitions such as ABU Robocon & collaborated on several research projects.
- Successfully organized 10+ guest lectures & led the university’s robotics team of 25+ members. (Advisor: [Dr. S. S. Ohol](#))

Robotics Intern - Binary Robotics

Nov 2020 – Jan 2021

- Engineered & deployed end-to-end ROS navigation stack for AMR’s in a real-world environment such as healthcare facility.

Selected Projects

Self-supervised learning for Deformable object manipulation | [Poster](#) | [Video](#) | [Code](#) | [Webpage](#)

- Investigated high-velocity dynamic actions such as fling using value network based policy on a dual-arm UR5e robot.
- Implemented Spatial Action Maps with self-supervised learning pipeline while achieving a success rate of 95.09%.

Autonomous UAV navigation using Deep Reinforcement Learning | [Video](#) | [Code](#)

- Trained PPO and SAC RL policy network for UAV navigation through tight spaces in a custom Airsim environment.
- Compared the results of both the policies while achieving an average success rate of 94% for SAC policy.

Deep Learning based robotic Grasping of unknown objects | [Video](#) | [Report](#) | [Code](#) | [Paper](#)

- Utilized transfer learning to build a CNN-based grasping model that predicts the 5-D grasp configuration with 83.3% accuracy
- Established end-to-end grasping pipeline with prediction of rotated 2D bounding boxes, Moveit support, 3D grasp pose estimation, Transforms from 2D image to the base link and finally the trajectory planning of robotic arm.

Visual SLAM & Object detection for Autonomous Mobile Robot | [Video](#) | [Paper](#)

- Implemented RTABMap SLAM algorithm on gazebo simulator and in real world using Kinect v2 RGB-D camera.
- Employed the YOLO v3 framework for real-time object detection in tandem with traditional SLAM map generation.

Publications & Awards

- Recipient of JN Tata Scholarship, MITACS GRI Award, Complete list at <https://pranay-junare.github.io/>
- “Deep Learning based end-to-end Grasping Pipeline on a lowcost 5-DOF Robotic arm.”, IEEE 19th India Council International Conference (INDICON), 2022. ([Paper](#))
- “Visual SLAM combined with Object detection for autonomous indoor navigation using Kinect V2 and ROS”, IEEE 6th International Conference on Computing, Communication and Automation (ICCCA), 2021. ([Paper](#))