

AKSHAYA AGRAWAL

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ONGOING RESEARCH

Cooperative Planning for Multiple Mobile Manipulators

Graduate Research Assistant

📅 June 2021 – Present

- Introduced a novel algorithm: Intersection of Manifolds RRT* (IMaRRT*) for transporting different structures using team of mobile manipulators with up to 80% success rate.
- IMaRRT* enabled complex cooperative manipulation in obstacle rich 3D world by exploring an intersection of manifolds.

PROJECTS

Traffic Management for Heterogeneous Robots

📅 Fall, 2022

- Devised difference reward based reward shaping mechanism that reduced traffic congestion by penalizing the deviation speed of heterogeneous robots.

Energy Optimized Trajectory for a Mobile Manipulator

📅 Spring, 2022

- Generated 25% more energy-efficient trajectories using quintic time-scaling in comparison to the cubic jerk trajectory planning method.

Kinova Arm Simulation to Open a Door

📅 Spring, 2021

- Integrated MoveIt motion planning framework with ROS to simulate Kinova Arm in Gazebo to open a door.

Kinodynamic Motion Planning for Robotic Arm

📅 Winter, 2021

- Applied Kinodynamic RRT* (in Python) to a 4DOF robotic arm which reduced the required torque by 30% compared to RRT*.

EXPERIENCE

Data Scientist

📅 Aug 2019 - Aug 2020

MillionEyes Healthcare

📍 Bengaluru, India

Developed a probabilistic symptom checker using Bayes' Theorem based on Ayurvedic principles.

Robotics ML Engineer

📅 May 2018 - August 2019

Capillary Technologies

📍 Bengaluru, India

Prototyped a end-to-end automated speech recognition solution.

Research Intern

📅 August 2017 - December 2017

Industrial Technology Research Institute

📍 Hsinchu, Taiwan

Designed the proof of concept of a imaging technique device for treating psoriasis or vitiligo.

PUBLICATIONS

1. A. Agrawal, D. Chang, and G. A. Hollinger 2022. Task and Motion Planning for Collective Robot Construction. In ICRA 2022 Workshop on Collective Robotic Construction, May 27, 2022, Philadelphia, PA.
2. M. Das, A. Agrawal, A. Sonone, R. Gupta, D. Upadhyay, Y.V.D. Rao, and A. Javed, "Developing a bioinspired pole climbing robot," 2016 International Conference on Robotics: Current Trends and Future Challenges, 2016.

EDUCATION

Ph.D. Student in Robotics

Oregon State University, USA

📅 Jan 2021 – Dec 2025

👤 Advisor: Geoff Hollinger

M.Sc. in Physics, and B.E in Electronics & Communications Engineering (Integrated)

BITS Pilani, India

📅 August 2013 – May 2018

SKILLS

Programming

Python



C/C++



Robotics Software

MoveIt



Rviz



ROS



Gazebo



PCL library



OpenCV



TensorFlow



PyTorch



RELEVANT COURSES

Oregon State University

Sequential Decision Making

Learning Based Control

Kinematics, Dynamics and Control

Nonlinear Optimization

Multiagent Systems

BITS Pilani

Object Oriented Programming

Probability and Statistics

Nonlinear Dynamics and Chaos

SOFT SKILLS

Problem Solving

Team Work

Empathy

Agile

Goal Oriented