

AKSHAYA AGRAWAL

<https://www.akshayaagrawal.com/> ♦ agrawaak@oregonstate.edu

RESEARCH STATEMENT

Driven by a passion for autonomous robotic solutions in hazardous environments, I am pursuing a PhD in Robotics at RDML, under the guidance of Professor Geoff Hollinger. My research interest involves task and motion planning utilizing multi-robot teams to perform construction activities in dangerous terrestrial, outer-space, and underwater environments, intending to mitigate the significant casualties that occur annually in the construction industry and enable efficient construction.

EDUCATION

Oregon State University, USA

P.hD. Robotics

Jan 2021 - Present

CGPA: 3.9

BITS Pilani Hyderabad Campus, India

MSc. (Hons.) Physics + B.E (Hons.) Electronics and Communications

August 2013 - July 2018

CGPA: 7.8

PROGRAMMING SKILLS AND TOOLS

Robotics

ROS 2, Gazebo, rviz, OMPL, pcl, MoveIt, OpenCV (1+ yrs)

Languages

Python (3+ yrs), C++/C (1+ years)

Embedded System Devices

Raspberry Pi, Arduino

Machine Learning Applications

TensorFlow, pyTorch

Synthetic Data generation (Unreal Engine)

CONFERENCE PUBLICATION

1. A. Agrawal et al., "Constrained Nonlinear Kaczmarz Projection on Intersections of Manifolds for Coordinated Multi-Robot Mobile Manipulation" *Accepted* for 2025 IEEE International Conference on Robotics and Automation (ICRA), Atlanta, USA, 2025.
2. A. Agrawal et al., "Underwater Multi-Robot Simulation and Motion Planning in Angler" *Accepted* for 2025 OCEANS, Brest, France, 2025.
3. 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.
4. 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.

WORK EXPERIENCE

Rugged Robotics

Sep 2023 - Jan 2024

Robotics Software Intern

- Designed mechanisms for calibrating the robot using motion capture system with an accuracy of 0.5 milliradian.
- Formulated innovative optimization problems for wheel and gimbal calibration while utilizing physical measurements wherever possible.

MillionEyes Healthcare Pvt. Ltd., Bengaluru

Aug 2019 - Aug 2020

Data Scientist

- Developed a rule-based COVID-19 assessment that enabled a million users to assess their situation and take necessary measures.
- Designed a probabilistic symptom checker using Bayes' Theorem based on Ayurvedic principles.

Capillary Technologies Pvt Ltd, Bengaluru

May 2018 - August 2019

Robotics Machine Learning Engineer

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

Indian Institute of Science (IISc), Bengaluru

Jan 2018 – May 2018

Research Intern

Worked on autonomous navigation of drones: Developed an algorithm based on Spatial Convolutional Neural Network for detecting roads in sparsely to densely congested unguided roads.

Industrial Technology Research Institute (ITRI), Hsinchu, Taiwan

Aug 2017 - Dec 2017

Research Intern

Prototyped the proof of concept of a device involving imaging technique for treating people suffering from psoriasis or vitiligo.

Soothe Healthcare, Noida, India

Oct 2016 – Feb 2017

Intern

Improvise algorithm and embedded system of Point of Care device for monitoring glucose level.

PROJECTS

Traffic Management for Heterogeneous Robots: 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: Generated 25% more energy-efficient trajectories using quintic time-scaling in comparison to the cubic jerk trajectory planning method.

Remote Testing Manipulator infrastructure: Integrated MoveIt motion planning framework with ROS to simulate Kinova Arm in Gazebo to open a door to enable remote testing of motion planning algorithms.

Object Fetch using FetchRobot: Programmed FetchRobot to navigate autonomously by building map and localizing using SLAM techniques. Integrated object recognition using simple computer vision techniques to enable FetchRobot to move the object using object pose estimation and trajectory planning while avoiding collision with static obstacles.

SysID: Neural Network based System parameters Estimation Trained a neural network on simulated data such that it can predict the mass(+added mass) and linear and non-linear damping coefficients of a system from a small sequence of measured position, velocity, acceleration and control inputs.

Kinodynamic Motion Planning for Robotic Arm: Applied Kinodynamic RRT* (in Python) to a 4DOF robotic arm which reduced the required torque by 30% compared to RRT*.

Neural Network based Manipulator Pose Estimation: Designed a pipeline to train a neural network capable of Kinova Arm pose estimation from its 2D RGB image. Implemented a simulated data generator for a Kinova Arm using Unreal Engine and DREAM Project.

Portable Urinary Tract Infection Inspection Device: Designed a sensor assembly for inspecting presence of respective pathogens based on colour concentration produced by several chemical reactions.

Maze solving warehouse inspired Robot: Fabricated a 6-DOF arm to fix on a mini-robot in order to pick up packages and deposit in designated zones.

3D snake game: Developed the 3D version of 2D snake game we played in old Nokia phones. It was based on the capacitive sensing principle.

AWARDS

Inspire Scholarship Awardee

Top 1 percentile students in India in 12th grade board exams by Department of Science and Technology, Government of India

REVIEWER

1. ICRA	2022 - 2025
2. IROS	2022 - 2025
3. RA-L	2023 - 2025
4. IJRR	2024

EXTRA-CIRRICULAR

• Judged 2024 MATE ROV Oregon Regional Competition	2024
• Lead College team for Robocon'16	2015 - 2016
• Core member of Honey Bee Network on Campus: Voices from Grassroots Innovators	2013 - 2014
• Participated in Nirman (College led NGO) events like teaching students.	2013 - 2014