

# RONAK NARKHEDE

St Paul, Minnesota US | +1 (763) 900 1339 | ronaknar2001@gmail.com

## EDUCATION

### UNIVERSITY OF MINNESOTA

Masters of Science in Robotics, CGPA: not yet available

Minneapolis, USA

September 2024 – December 2025

### SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

Bachelors in Mechatronics with specialization in Robotics, CGPA: 8.32/10

Chennai, India

September 2020 – June 2024

## Skills

**Programming Languages:** Python, C++, Matlab

**Softwares and Frameworks:** NumPy, SciPy, Pandas, OpenCV, PyTorch, Eigen, OpenCV, OMPL

**Hardware and Tools:** ROS 1, Robot programming (ABB, Fanuc), Gazebo, MuJoCo, Simulink

## WORK EXPERIENCE

### PHYCHEM TECHNOLOGIES

Nashik, India

#### Computer Vision Intern

May 2023 – August 2023

- Successfully developed a model capable of classifying between two types of roto moulding powders.
- Implemented a custom Convolutional Neural Network (CNN) architecture, fine-tuned using transfer learning from pre-trained model ResNet, achieving an 86% classification accuracy.
- Collaborated with embedded systems engineers to integrate the vision system into the existing assembly line infrastructure, developing a high-performance sorting algorithm in C++ that processed 76 samples per minute.

#### Robotics Engineer Intern

December 2022 – February 2023

- Played a key role in the development of a parallel delta robot, contributing to both hardware integration and software implementation.
- Conducted comprehensive kinematic analysis, including frame assignment, workspace optimization, and derivation and implementation of inverse kinematics in python.
- Designed and implemented an efficient trapezoidal joint space trajectory planning algorithm, resulting in improvements in motion smoothness and accuracy.
- Developed a custom ROS package for the delta robot, integrating sensor feedback and implementing closed-loop control for enhanced precision.

## RELEVANT ACADEMIC AND RESEARCH PROJECTS

### VISION-BASED HUMAN-MACHINE INTERACTIVE DEVICE | Prof. Ranjith Pillai

August 2023

- Developed a wireless vision-based controller for serial manipulators, Facilitating intuitive 3D point selection in the robot's actual workspace.
- Made use of a stereo camera and Fiducial markers for pose estimation achieving centimeter accuracy in spatial mapping and object localization.
- Utilized ROS to create a modular and scalable software framework, facilitating integration with various robotic platforms and sensors.

### 3R SERIAL MANIPULATOR ARM | Prof. Ranjith Pillai

January 2023

- Implemented a custom C++ kinematics solver, achieving real-time performance with computation times under 11ms for inverse kinematics solutions.
- Designed and implemented an efficient cubic trajectory planning algorithm, generating smooth, jerk-minimized joint space trajectories for precise and smooth manipulator movements.
- Optimized workspace generation in point cloud data, reducing computation time from 9 minutes to 11 seconds through implementation of vectorization techniques.

## LEADERSHIP AND OUTREACH EXPERIENCE

### NEXT TECH LAB

Chennai, India

#### Board Member, Robotics and Embedded Systems

April 2022 – June 2024

- Led SRM's most esteemed and internationally recognized research lab, honored with the prestigious International QS Award.
- Managed and guided a highly skilled team of 20+ researchers, ensuring the successful execution of their diverse projects.
- Overseen a plethora of research initiatives, comprising 15 hardware projects and 5 other research projects. Additionally, managed the organization and successful execution of more than 10 events and workshops.