# Mani Deep Cherukuri

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## *Education*

**University of Minnesota, Twin Cities** *Minneapolis, MN*
*Master of Science (MS) in Robotics - GPA: 3.67/4.0* *09/2022 - Present*

**Courses:** Deep Learning, Computer Vision, Machine Learning, Artificial Intelligence, Robotics, NLP, Data Mining

**Manipal Institute of Technology, MAHE** *Manipal, India*
*Bachelor of Technology (B. Tech) in Electronics and Communication Engineering - GPA: 7.25/10* *08/2016 - 08/2020*

**Courses:** Data Science Specialization, Java, Computer Architecture, Micro-controllers, Digital Signal Processing

## *Work experience*

**MeritTrac Services Pvt. Ltd.** *Bangalore, India*
***Machine Learning Engineer* - Python, React, JavaScript, MySQL** *03/2021 - 08/2022*

- Developed a secure, real-time proctoring system, enhancing exam integrity and ensuring candidate authentication.
- Implemented AI-based gaze tracking for distraction alerts, improving assessment monitoring.
- Increased company revenue by over 10% with a half-million-dollar impact on sales.

**UNext Learning Pvt. Ltd.** *Bangalore, India*
***Software Development Engineer* - Java, MySQL, AWS** *06/2020 - 03/2021*

- Designed database schema, developed Java back-end web applications with Spring, Hibernate, and REST APIs.

## *Academic Projects*

**Dynamic NeRF with Depth-Supervision for Scene Flows - PyTorch, TensorBoard, OpenCV** *01/2023 - 05/2023*

- Pioneered a first-of-its-kind approach, enhancing dynamic NeRF with depth supervision techniques to achieve superior 3D view synthesis from monocular video inputs, including space-time interpolation.
- Successfully outperformed original methods, cutting training time by over 30% and improving render quality with an LPIPS score of 0.205 (original authors, 0.233).

**KineLLM - A Task Planning FrameWork using LLM - ThreeJs, KinEval** *07/2023 - 12/2023*

- Adapted the capabilities of LLM generalisation for performing task planning by extending prior work done with mobile manipulation in the Kineval environment to incorporate the user telling the LLM about the environment and having the LLM plan a set of tasks for the robot manipulation.

**Multimodal Tree of Thought for Visual Question Answering - Hugging Face** *07/2023 - 11/2023*

- Implemented Tree of Thought using a multi-modal approach, integrating text and vision for improved rationale generation by employing a fine-tuned UnifiedQA model based on T5 transformer architecture.
- Achieved a significant 49% improvement on the failed cases from the SOTA model (LLaVa) on the ScienceQA dataset

**Adaptive Vision Transformer with dynamic adaptation of patches - PyTorch, TensorBoard** *06/2023 - 11/2023*

- Enhanced image classification with dynamic patches adaptation and weight multiplexing in a Vision Transformer (ViT) on ImageNet-1k, advancing model efficiency and performance

**SLAM implementation on Formula Student Driverless Vehicle - ROS, OpenCV** *08/2019 - 06/2020*

- Using the FSOCO Dataset for visual Perception, LiDAR and stereo camera pipeline were implemented to locate the colored cones on the track and generate a 3D map of the cones to predict the vehicle's future state.

## *Publications*

**Battery Management System Design for Electric Vehicle** *IEEE DISCOVER 2019*

- Developed a Battery Monitoring System with telemetry and DAQ applications, incorporating Machine Learning techniques to predict State of Charge (SoC) for the autonomous system of an formula student driverless car.

## *Technical skills*

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|---|---|
| **Programming Languages** | Python, Java, SQL, R, JavaScript, HTML, C++ |
| **Frameworks/ Libraries** | PyTorch, TensorFlow, threeJS, Keras, SciKit-Learn, NLTK, Spring, Spring-Boot, Hibernate, NodeJS, ReactJS, ROS, HPC Slurm |