

KALAISELVAN THANGARAJ

Autonomous Systems Engineer

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EXPERIENCE

Research Intern (Master Thesis)

Thoughtworks

📅 Nov 2023 – Feb 2024

📍 India

- Developed a novel framework for automating the formal verification of neural network-based object detection modules in autonomous vehicles
- Created a tool to automatically generate formal specifications using ontologies and leveraged vision-language models to verify them formally
- Implemented a prototype tool to demonstrate the feasibility of the proposed approach on a German traffic sign detection module

Robotics Engineer

Corning

📅 Dec 2021 – July 2022

📍 Germany

- Contributed to the development of robotic cells to automate the assembly process for optical communication modules using a robotic manipulator
- Optimized path planning and computer vision algorithms to increase system performance and reliability
- Designed and implemented an intuitive GUI for controlling the assembly process, focusing on user experience and improved efficiency

ACADEMIC PROJECTS

1. Distributed State Estimation

- Implemented distributed state estimation by fusing data from multiple sensors for accurate object localization
- Developed a Kalman-consensus filter-based system for multi-sensor object tracking

Keyword/Stack: MATLAB State Estimation

2. Optimization-based Robot Control

- Utilized Deep Reinforcement Learning techniques (DQN) to implement a controller to stabilize an inverted double pendulum

Keyword/Stack: Python Robot Control

Reinforcement Learning

3. Multi-robot Path Planning and Evacuation

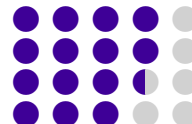
- Developed a grid-based global path planning algorithm for efficient multi-robot evacuation
- Generated collision-free Dubins paths by considering robot and obstacle positions dynamically

Keyword/Stack: ROS2 Python Path Planning

SKILLS

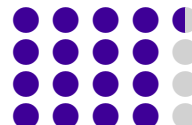
Autonomous Systems

Computer Vision
Sensor Fusion and State Estimation
Robot and Vehicle Control
Localization, Mapping & Path Planning



Software and Programming

Python
C++
ROS, ROS2
Git, Docker



AI/ML

Deep Learning
Reinforcement Learning



Others

Rust, MATLAB
Web Development, UI/UX
Rapid Prototyping



EDUCATION

M.Sc Autonomous Systems (Dual Degree)

Technische Universität Berlin

📅 Oct 2020 – Mar 2022

📍 Germany

Univeristy Of Trento

📅 Oct 2022 – July 2024

📍 Italy

LANGUAGES

Tamil

Native

English

C1

German

A1