



# Adithya M N

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## SUMMARY

→ Graduate Student with keen interest in Mobile Robotics, Machine Vision and Autonomous Systems. My passion for robotics enthused me to take up various projects which helped me gain a lot of practical knowledge, shaping my views on how I learn subjects. Excited to take up an array of subjects and willing to pursue it with utmost dedication.

### Technical Skills :

→ **Subjects :** Robot Kinematics and Dynamics ◇ Computer Vision ◇ Mobile Robotics ◇ Deep Learning

→ **Softwares :** Python ◇ MATLAB ◇ LabVIEW ◇ LaTeX ◇ Solidworks

→ **Frameworks & Libraries :** Tensorflow ◇ OpenCV ◇ Keras ◇ Scikit Learn

**Languages :** English ◇ German (B1 Level) ◇ French ◇ Hindi ◇ Telugu ◇ Tamil

## EDUCATION

**June 2017 - May 2021**      **S. R. M. Institute of Science and Technology, Chennai, India.**

→ B.Tech Mechatronics Engineering

→ **CGPA - 7.98/10 (85.69%)**

**June 2015 - April 2017**      **Padma Seshadri Bala Bhavan, Chennai, India**

→ HSC - Informatics Practices (Java)

→ **CGPA - 8.8/10**

## WORK EXPERIENCE

**Sept 2020 - Oct 2020**      **Engineer Intern - Hinduja Tech Limited, Chennai, India.**

→ Worked on the project "Automatic Pizza Vending Machine".

→ Proposed a new methodology for the pizza cutting mechanism - Ultrasonic Cutting and the pizza cutter cleaning mechanism - Hydrophobic Coating

→ Coordinated with a team to solve tasks and was commended for the contribution made.

**June 2018 - Dec 2018**      **Industrial Trainee - Rexroth Bosch Pvt. Ltd., Chennai, India.**

→ Trained at "SRM-BRIN Center of Excellence in Automation Technology"

→ Exposed to industrial automation based on electronic and proportional hydraulics

→ Supervised a team of 5 and was tasked with several real world problems faced by industries such as problems during inspection, maintenance and troubleshooting repair.

## PROJECTS (Highlights)

**Jan 2021 - May 2021**      **Development of a Collaborative Multi-Robot System for Material Handling**

→ Multiple Mobile robot transport a material from one location to another autonomously within the arena by collaborating with each other.

→ Developed a novel "Composite Robot Algorithm" for a holonomic robot formation to transport the object. Configured a co-operative path planning algorithm that provides three collision free paths from a single set of waypoints.

**July 2020 - Oct 2020**      **Path Planning in a 2D Environment**

→ Developed a differential drive robot model and built a custom 2D binary occupancy grid in which path planning was simulated.

→ Implemented probabilistic roadmaps as the motion planner to find the shortest path between the locations and a modified pure pursuit controller for efficient path tracking; in the software stack.

**Jan 2020 - June 2020**      **RoboCUBES - An Intelligent, Modular, Reconfigurable Robotics Platform**

→ Built a modular reconfigurable robot that uses modular cubes to autonomously detect many configurations and performs a specific functions based on the detected configuration.

→ Configured a complete modular software stack based on a novel "Self-Awareness" algorithm.

→ Developed a **patented** novel hardware addressing system designed to interact with the algorithm and detect the configuration autonomously.

→ Developed Object-detection/tracking, Lane Detection and implemented Visual SLAM for AI/CV Cube.

**Feb 2018 - May 2018**      **Virtual Digital Storage Oscilloscope**

→ Coordinated with a team of 5 with the aim of creating a "low cost" PC based Oscilloscope.

→ A comparative study between our research project and the industry standard "Keysight InfiniiVision DSO-X 2002A" was conducted and the corresponding trade-offs were studied.

→ Developed an 8 channel Virtual DSO. Implemented in NI LabVIEW. Designed the hardware interfacing unit and interfacing system.

<b>November 2020</b>	<b>An Onboard Hardware Addressing System for Modular Reconfigurable Robots</b> → This invention envisages an on-board hardware addressing system for a modular reconfigurable robot (MRR). The MRR is composed of at least one central module and plurality of peripheral modules each of whom have dockable faces. → This invention is low cost, hardware level addressing system for the MRR. The modified power rails connect pins to a unique hardware address. Thereby autonomously detecting the configuration the MRR is currently in.
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## AWARDS AND PRIZES

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<b>January 2020</b>	<b>Runners Up : Make-A-Thon 4.0 by Lema Labs</b> - Project : BlockBots <b>Most Popular Project Award</b> - Make-A-Thon 4.0
<b>June 2019</b>	<b>Placed 2<sup>nd</sup></b> : Maze Solving Robot Competition - Kaizen Robotics
<b>December 2018</b>	<b>Placed 2<sup>nd</sup></b> : Course Following Robot Competition - Kaizen Robotics
<b>April 2018</b>	<b>Best Project</b> : Physics and Nanotechnology Research Day - Obstacle Avoiding Robot

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## CERTIFICATIONS (Highlights)

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### Robotics Certifications :

<b>June 2020</b>	<b>Control of Mobile Robots - Georgia Institute of Technology (Coursera)</b> → Primarily dealt with Control Systems. Worked on many navigation problem of mobile robots, developed switches using control theory to switch between “go-to-goal” and “obstacle avoiding” behaviour.
<b>January 2020</b>	<b>Autonomous Mobile Robots - ETH Zurich (Edx)</b> → Learned fundamentals on several probabilistic robotics concepts such as, mobile robot kinematics, map representation state estimation using perception, probabilistic map based localisation and motion planning.
<b>June 2019</b>	<b>Kaizen Robotics Training Program - Lema Labs</b> → Gained practical knowledge in robotics, register level programming- embedded C & arduino programming. → Tasked with several robotics projects, from "ADC based speed control" to "Maze Solver with shortest path algorithm". → Developed a “Hand-Writing” robot using G-code conversion to convert data into motor commands.

### Artificial Intelligence and Machine Learning Certifications :

<b>May 2020 - July 2020</b>	<b>Self - Driving Cars Specialization - University of Toronto (Coursera)</b> ♦ <b>Introduction to Self Driving Cars</b> → This course laid the foundation for various segments incorporated in the development of an autonomous vehicle. Learned the various terminology, design considerations and safety assessment of self-driving cars. ♦ <b>State Estimation and Localisation of Self Driving Cars</b> → Introduced to different sensors and their use for state estimation and localization in self-driving car → Developed models for localisation sensors such as IMU and GPS and applied Extended and Unscented Kalman Filter for the estimation problem. ♦ <b>Visual Perception of Self Driving Cars</b> → Derived a pin-hole camera model and Performed intrinsic and extrinsic calculations on it. → Performed static and dynamic object detection using deep learning. → Applied semantic segmentation for the estimation of the drivable surface. ♦ <b>Motion Planning for Self Driving Cars</b> → Learned the fundamental concepts of all the different motion planners such as mission planner, behavioural planner. → Implemented Dijkstra's and A* algorithm to find the shortest path between two places → Introduced to a Hierarchical motion planner to navigate autonomously through an environment using the carla simulator.
<b>July 2020</b>	<b>Structuring Machine Learning Projects (Coursera)</b> → Learned how to diagnose errors and reduce them in any machine learning system. → Analysed the effect of bias and variance with mismatched data. Introduced to transfer learning and end to end deep learning.
<b>June 2020</b>	<b>Machine Learning Advanced Certification Program (Simpli Learn)</b> → Gained comprehensive & in depth knowledge in all the fundamental machine learning concepts. → Worked with real-time data, developed algorithms using supervised and unsupervised learning, regression, classification, time series modelling and recommender systems.