MUGILRAJ D

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EDUCATION

National Institute of Technology, Tiruchirappalli, TamilNadu - 620015 — Jul 2017 – Present

B.Tech,
Major in Instrumentation and Control Engineering
Minor in Computer Science Engineering

Mangalam Her Sec School, cuddalore, TamilNadu - 608601 — Jun 2015 – May 2017

HSC
Percentage : 82.5%

AREA OF INTERESTS

Embedded Programming | Driver Development | Robotics | Control Systems | Autonomous Vehicles | Motion planning.

RESEARCH PROJECTS

OPTICAL MOUSE AS AN ODOMETRY — Jan 2020 – Apr 2020

- Developed a linux kernel module to get the mouse data for precise Indoor localization in the Wheeled robots. Here, I build a char device driver that can send a Δx and Δy ie. change in x and y axis to the user space buffer.

SWARM OF DIFFERENTIAL DRIVE ROBOTS — Oct 2019 – Present

Mentored by Prof. E S GOPI

- Developed a swarm of wheeled robots equipped with vision sensors for search operation in a cluttered environment to find the target the using Particle Swarm Optimization.
- **Role :** Raspberry Pi programming, Image processing, PSO.

SUMMER INTERSHIP | IIT MADRAS — Apr 2019 – Jun 2019

Mentored by Prof. SATADAL GHOSH

- Worked under the project called Hu-Moment Based landing of Autonomous UAV's. This project work involves collecting the image form UAV and using the shape descriptor, find the Hu-moments of the image and based on the Hu-moments, horizontal and vertical distance of UAV to estimate the motion and landing of UAV.
- **Role :** Image processing, Data Acquisition, Pixhawk Programming.

WIRELESS MESH NETWORK PATH OPTIMIZATION | QUALCOMM — Apr 2019 – Jun 2019

Mentored by Qualcomm

- Developed a user space application in Linux Wireless stack to optimize the existing route detection/Path planning in Mesh Network (IEEE 80211s). Implemented D* lite a graph-based replanning algorithm in Ath10k driver for routing of data packets in a dynamic wireless mesh network.
- **Role :** Created a Mesh Network, Bash script (over 500+ lines), Algorithm.

CLOUD BASED SAFETY CHECK SYSTEM FOR UAV'S | TATA GTIO — Dec 2018 – Mar 2019

Mentored by Tata GTIO

- Flight data collected from the varies sensors which are stored and processed in the onboard computer. USB dongles were used to provide internet data services for the onboard computer in order to connect with the cloud. The cloud is a hosting server for handling requests from drones. The cloud is accessible through a web interface.
- **Role :** Pixhawk Programming, Fabrication of Quad-Copter, Rpi-Pixhawk Communication.

SEMI-AUTONOMOUS GROUND ROBOT | E-Yantra IIT-B — Nov 2018 – Feb 2019

Mentored by E-yantra

- Developed a python package for semi-autonomous ground robot to traverse over a complex unweighted graph arena with responsive **AR(Augmented Reality)** objects distributed over the arena built using OpenGL framework. April-tags were adapted for precised positioning of AR object.
- **Link** for Rule book to get more detailed information about this project.
- **Role :** Atmega2560 Chip Programming, Fabrication, Augmented Reality, Algorithm.

MINI PROJECTS

- Automatic Piano Game Player — Mar 2019
  - Designed a mobile piano tile game player using ATmega328p, LDR, Relay and some electronics components.
  - In game, the tiles will be in black and white colour. The colour of the tile can be found using LDR.
  - Based on the LDR's output the micro-controller will give signal to relay. Aluminium foils will attached with the relay that will simulate the touch in mobile screen.
- TIC-TAC-TOE GAME BOARD — Mar 2018
  - Designed a Tic-Tac-Toe game using ATmega328p and some electronics components.
  - X and O can be set on alternate turns. Glow the LED for setting X and blink the LED for setting O.
  - Once the winner has been decided, glow or blink all the LED's accordingly.
- Servo Motor Using DC Motor — May 2018
  - Conversion of a DC motor into a servo motor using a rotary wheel encoder.
  - Capable of 360° rotation and a cost-effective alternative for higher torque range.

COURSEWORK

Undergraduate

Operating Systems | Internet of Things(IoT) | Micro-processor and Micro-controller | Data structures and Algorithms | Control Systems 1 | Modern Control System | Artificial Neural Network | Algebra and Probability theory | Numerical Methods | Database Managment.

Online Course

Development of Real-Time systems | Aerial Robotics ***(University of Pennsylvania)*** | Embedded Systems ***(Georgia Tech)***

SKILLS & EXPERIENCE

Software

ROS (Robotic Operating System) | MATLAB | Atmel Studio | Tina Ti.

Language

Embedded C | Arduino C | Python | C | Bash Scripting | LaTeX.

Hardware

Raspberry Pi | Arduino Atmel Series | Pixhawk.

ACHIEVEMENTS

- Top 5 in Defence Innovation Challenge event of Shaastra'20, Annual International Level technical festival of Indian Institute of Technology, Madras. — Jan 2020
- Top 3 in Qualcomm Makeathon event of Probe'19, The National level annual technical Symposium of ECE Department NIT-Trichy. — Jun 2019
- Secured 3rd place in Sangam event of Pragyan'19, The International Techno-Management Festival of NIT-Trichy. — Mar 2019
- Finalist of E-Yantra'19, International Robotics competition conducted by Indian Institute of Technology, Bombay. — Feb 2019
- Top 4 over 50+ team of Quadcopter Challenge event of Shaastra'19, Annual International Level technical festival of Indian Institute of Technology, Madras. — Jan 2019
- Top 5 over 250+ team of TATA Makeathon event of Techfest'18, Annual International Level technical festival of Indian Institute of Technology, Bombay. — Dec 2018
- A-Grade Holder, NCC — 2014

POSITIONS OF RESPONSIBILITY

Aerial Robotics and Aeromodelling Society, NIT Trichy
Member — Aug 2018 – Present

National Service Scheme , NIT Trichy
Member — Aug 2017 – Present

Sensors, Technical Symposium of Instrmentation and Control Dept. ,NIT Trichy
Workshop Instructor — Aug 2017 – Present