# MUHAMMED ROSHAN P

## Embedded system | Deep Learning | Automotive | Maker

A Technology enthusiast, Curious about Learning new Technologies and passionate about making something out of it. Capable of realizing any idea into quality product with minimal supervision. In Search of Challenging opportunity where i can express and enhance my skills to change the world tomorrow. I will be best fit in research project on inter disciplinary domains.


roshantact@gmail.com
8907089522
linkedin.com/in/roshantac
github.com/roshantac


## Skills and Expertise

- ✔ **Programming with**
  C C++ Python C# PyQt SQLite
- ✔ **Protocols worked with**
  SPI I2C UART CAN LIN
- ✔ **Automotive Standards worked**
  UDS J2602
- ✔ Worked with various controllers ranging from 8051 to ARM/Power.
- ✔ **Code Coverage** analysis and **Unit testing** with Rapita tools.
- ✔ **Windows Application** development (Software Tools).
- ✔ **Linux** and **Free RTOS** programming.
- ✔ IOT and Wireless Sensor Network.
- ✔ **Deep learning**
  - Worked with various standard Deep neural network architectures and models.
  - Knowledge in various **Machine learning algorithms**.
  - Pose estimation and localisation
  - Generative models
  - Encoder and Decoder models
  - Natural Language processing
- ✔ **AI Frameworks Familiar with**
  Pytorch Keras Matplotlib OpenCV etc.
- ✔ **Cloud Deployment**(AWS Lambda) of DL models.
- ✔ Deployment of Deep learning models in Hardware platforms (single board computers).

## Work Experience

### Embedded system Engineer at DANLAW

*11/2018 – Present*

Joined as the first member in Automotive Electronics Solutions Team. Being the only employee in the team for more than one year completed one product and its supporting software all alone.

**Recognition:-** *Received Danlaw Rising Star Award 2019*

### Projects

#### 1. LC PRNDL Development

**Technologies: C, LIN, I2C, UDS, J2602, C#, Arduino, Multi-Core System Design, Rapi Cover, Rapi Test.**

PRNDL is a device used to indicate the current gear position in vehicles. It receives commands through LIN and control the LED s and its brightness accordingly. The product support various diagnostics, Calibration and Flashing of application and calibration table over LIN protocol.

- ✔ Responsible for complete systems and software design and its implementation (Software lead).
- ✔ Involved in project discussions with global team.
- ✔ Developed the product according to J2602 and UDS standard.
- ✔ Performed Code coverage analysis and Unit testing using RAPITA Tools.
- ✔ Drafted various documents such as software design document, High Level Design Document, Low level design document, Hardware software interface document and etc.
- ✔ Developed PRNDL **Flashing tool** which support multiple flashing protocols and authentication features in C#.
- ✔ Involved in planning of specification for calibration tool and end of line production tool.
- ✔ Software development for PRNDL **End of Line Testing Tool** (Arduino and sensor array).
- ✔ Supported various activities of validation team such as creating product test plan, electrical characteristic analysis and etc.
- ✔ Completed product design life cycle.

### 2. V2X Event Log Analysis

**Technologies: Python**

V2X device will generate Logs on occurrence of Events. The software will analyse the logs and classify them in to different classes. It also extract the informations from the messages and restructure them for easy access.

### 3. V2X RF Log Analysis

**Technologies: Python**

The RF logs generated by the V2X device are captured and classify them into various classes . The software will analyse the logs and classify them in to different classes. It also extract the informations from the messages and restructure them for easy access.

### 4. Environment Perception Module for V2X

**Technologies: C, Linux, IPC, CAPI**

- ✔ This module receives the Remote Vehicle information from the surrounding and classify them into different groups based on various parameter and store in particular structure for easy access.
- ✔ The module also updates the structure if the Remote vehicle parameters are changed
- ✔ It also facilitate fetching of object with given classification filtering criteria.

### 5. Door System Module

**Technologies: Power PC, LIN, CAN, FreeRTOS**

The door system module was LIN master ECU which receives the information about door position and window position from touch screen module and control the window position and command the door control ECU for its operation.

- ✔ Designed a prototype of Door System module.
- ✔ Discussed design aspects of the system with local team members and global team for creating specification and designs.
- ✔ Responsible for software development for master(LIN) ECU.

## Co-Founder at Aproxy Developers

*6/2018 – 10-2018*

- ✔ Established a project guidance centre to support academic projects.
- ✔ Conducted various workshops on IOT, Embedded systems, PCB Design etc.

## Resource Person at FABLAB College of Engineering Chengannur

*01/2018 – 05/2018*

- ✔ Mentor for Diploma, Btech, Mtech academic projects.
- ✔ Conducted Various workshop on Embedded system, IOT, PCB design etc.

# Education

## Btech Electronics and Communication from Cochin University of Science and Technology

*GPA: 6.9*

*08/2013 – 05/2017*

Active member in various Technical clubs and forums, worked on more than 3 dozen projects.

### Projects

#### 1. Peer to Peer Communication over Adhoc Network

**Technologies: C, ARM Cortex M4, WSN**

A self expanding wireless mesh communication system that enables communication within less infrastructure. Designed a mobile phone like system capable of sending and receiving text message, each node will also act as repeater to other nodes along with its operation.

#### 2. Card less ATM using Biometrics

**Technologies: C, PyQt, Beaglebone Black**

Designed as a part of Texas Instruments Design India challenge2017.

#### 3. Restaurant Automation system

**Technologies: C, PyQt, Raspberry-pi, Arduino**

The Guest can place the order via touch screen display and will be sent to kitchen, A robot will be delivering the food.

## HSE Computer Science

Percentage : 86

## SSLC from Technical School (Electronics)

Percentage : 82

# Courses

### Extensive Vision AI from theschoolof.ai

Advanced Deep learning course with special emphasis on computer vision. Spreads over three semester, each semester ends with one capstone project.
**Course Repo Phase1**: github.com/roshantac/EVA4
**Course Repo Phase2:** github.com/EVA4-RS-Group/Phase2
**Project Website:** rsgroup.s3-website.ap-south-1.amazonaws.com/

### Projects:

#### 1. Monocular Depth and background removal using Deep learning (Capstone Project)

**Technologies: Pytorch, Python, OpenCv, Image segmentation**
**Project URL: -** github.com/roshantac/EVA4/tree/master/Assignment15/B
- Estimate Depth Heat map from 2D image.
- Extracts foreground from 2D image.
- Created a Dataset with 1.2 Million images from scratch.
- Created Customized model from UNET Architecture.
- Achieved results much closer to ground truth.
- The model is tested with various optimizing algorithms.
- Selected as **top 4 submission in** the course.

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# Certifications

### Image Super Resolution from Coursera

### Generate Synthetic Image with DC GAN for Coursera