SARALA RAVINDRA

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SUMMARY

Software Engineer in automotive industry experienced in data analysis (sensor and spatial data), Embedded Software Systems, Image processing, automotive communication systems seeking full-time opportunities.

EDUCATION

Master of Science in Electrical Engineering   Aug 2016 - May 2018

Michigan Technological University, Houghton MI, GPA: 3.37/4.00

Coursework: Wireless Embedded Sensor Networks, Distributed Embedded Control Systems, In-vehicular communication, Machine Learning, Probability and Stochastic Processes, Image Processing, Robotic vision.
Report: Traffic Sign detection methods

Bachelor of Engineering in Electronics and Communication Engineering   Aug 2012 - Mar 2016

Visveswaraya Technological University, Karnataka, India, GPA: 3.5/4.00

SKILLS

- Python
- SQL
- GUI development
- C++
- PySpark
- OpenCV
- CNNs
- Machine Learning
- MATLAB/Simulink
- ECU design/calibration
- V2X
- Linux
- Image processing
- CANv2.0
- OpenStreetMap, GIS

WORK EXPERIENCE

General Motors LLC   Nov 2019 - Present
Software Engineer, Connected Vehicle Research (Data and Analytics) - Contingent worker   Warren,MI

- Analyze vehicle signals from test vehicle CAN messages and company database (real world data) to build new product using python, pandas, SQL, pySpark, Hue environment
- Create custom geometric segments using Open Source Routing Machine(OSRM) services to scale and analyze large-scale spatial sensor data and build automated pipelines - geohash, folium
- Model applications using crowd sourced data to identify key metrics to produce estimation models based on target market - OpenCV, SciPy modules

Danlaw Inc.   Feb 2019 - Oct 2019
Engineering Intern, Connected Vehicle Systems   Novi, MI

- Prototype python kivy based GUI to demonstrate Connected Vehicle (V2X) applications at **Intelligent Transportation Society America 2019** - trade show
- Emulate V2X applications(Emergency vehicle requesting traffic light preemption) using micro controllers
- Interact with potential clients on V2X products collaborating with the sales team , Market Study on recent trends in connected vehicle sector

Meograph Inc.   July 2019 - Dec 2019
Programming Intern   Atlanta, GA

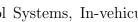- Optimize Facial key-point detection and tracking using Objective C for an iOS application

ECE lab, MTU   Jan 2018 - Apr 2018
Teaching Assistant   Houghton, MI

- Handled 3 sections of students in Electric Circuits 2 lab.Circuit debugging, code debugging to perform electrical lab experiments and simulate the results NI Multisim software.

PROJECT EXPERIENCE

Control Area Network (CAN) Communications   Aug 2017 - Dec 2017

· Setup CAN communication between multiple CAN nodes using (Arduino 2560 and **CAN shield** (MCP2515 CAN controller with the MCP2551 CAN transceiver)).

1. CAN node ID **filtration and masking**

2. Obstacle detection, Buzzer control, DC motor speed control

3. ADAS Autonomous parking using servomotor (to orient sensor),ultrasonic sensor(object distance and presence) with multi-chasis

4. Encode,decode CAN messages transmitted between a laptop and an HEV powertrain control modules using **CANking** through it's On-Board Diagnostics-**OBD II**

Remote Electronic Control via CAN to control HEV control modules   Jan 2017 - May 2017

· Hardware in Loop (HIL) based simulations of Hybrid Electric Vehicle(HEV) control modules: electronic throttle control using PID controller , stepper motor, spark ignition, fuel injection.

· Implemented CAN between the Electronic Control Units (ECUs) monitoring the control modules. Calibrated/validated the model on **Freescale MPC565 Woodward**'s ECU using MotoHawk, MotoTune and CANKing.

· Model logic for Driving mode, Engine static status, engine start/stop, electric motor start/stop, stepper motor, blend factor

Smart Farming via Distributed Sensing Network   Sep 2016 - Dec 2016

· Designed wireless embedded sensor network using TelosB Nodes & Raspberry Pi to periodically monitor the health of plants in a farm by sensing data (Humidity, Temperature, light)

· Monitor changes in farm data both numeric , modelled logic to warn of extreme conditions. Programmed using C++

Research - Study on Various Traffic Sign Detection Techniques   Jan 2018 - Apr 2018

· Surveyed various traffic sign detection methods as a part of my directed study under Dr.Michael C. Roggemann.

· The study included color-based(RGB, HSV, IHLS) segmentation, shape-based(Template matching, Hough circle) segmentation, other features (HOG, BRISK, ORB descriptors) based detection and YOLO detection

· Introduced to various neural networks such as RCNN, Fast RCNN and Faster RCNN nets to localize objects.

Vehicle detection using Machine learning   Jan 2018 - Feb 2018

· Implemented Support Vector Machine (SVM) classifier trained on Histogram of Oriented Gradients (HOG) , color features for vehicle detection on a vehicle onboard video. Programmed in python, Used max suppression method to eliminate redundant detection by sliding window approach

Single Object Tracking in a traffic Video based on Correlation Detection   Mar 2018

· Developed Correlation based object detector to track a moving ball in a game video.

· 25 percent reduction in per frame processing time by limiting the region of object search compared to traditional correlation based trackers.

· The limitation of region of search is achieved by prediction of the possible position co-ordinates of the object in the incoming frame by keeping track of a set of the previous frames position coordinates.