

# SINDHU NARAYANASWAMY

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## SUMMARY

Software engineer with experience in developing real-time embedded software on ARM processors; Implemented Feedback Control Systems and Sensor Fusion Algorithms in C, C++, Python and MATLAB, Experience in Hardware – Software Integration; Optimized Deep Learning Models; Knowledge of Functional Safety Standards and Controls Software Tools.

## PROFESSIONAL EXPERIENCE

### **Embedded Software Engineer Intern, Bosch, Ann Arbor, MI**

**May 2019 – Aug 2019**

- Developed body control software in Embedded C to realize automatic headlights and wiper control; Simulated the state flow diagram and control system using model-based tool ASCET to ensure algorithm robustness.
- Integrated AUTOSAR architecture and configured Basic Software for Infineon Aurix-TC277 and improved development velocity by optimizing AUTOSAR workflow. Also programmed API to facilitate HW - SW interaction.
- Integrated and Tested ECU software using ISOLAR-EVE (virtual ECU) tool leveraging the AUTOSAR standard, thus enhancing software quality at an early point in the development process.

### **Software Engineer, Bosch, Bangalore, India**

**Sep 2016 – Jul 2018**

- Developed Diagnostic Software for parameter monitoring from Application SW, and Basic SW (CAN, DCOM). Automated unit testing and component testing for C code using CANTATA++. Achieved 10% improvement in SW quality. Used Vector tools (CANalyzer) to conduct release testing in HIL environment.
- Created State estimation (Kalman Filter), sensor fusion algorithms and control (state) flow for Electronic Stability Controller functionalities based on customer requirements, while ensuring compliance to ISO 26262 standards.
- Developed AUTOSAR embedded software for Electronic Stability Program ECU following V-model of ASPICE, from requirement analysis using Doors to unit test, validation and verification for high priority projects such as Ford V36x Transit, Ford F150, P552 to achieve ASPICE compliance.

### **Software Engineer Intern, Indian Space Research Organization, Bangalore, India**

**Jan 2016 – Apr 2016**

- Designed a system-level Simulink model for 16-Point FFT to validate proposed DSP architecture. Verified 4096 Point FFT algorithm accuracy using MATLAB code, Programmed Radix-2<sup>2</sup> SDF(DSP) algorithm in VHDL and targeted into Xilinx Virtex-4 FPGA, which optimized HW utilization to 81% on FPGA, and improved OFDM system performance.
- Tested this DSP model on OFDM modulator/demodulator with real-time inputs, obtained a precision error of 0.2%. Implemented this architecture on OFDMA based WiMAX communication modules and improved their efficiency by utilizing an FPGA based FFT program.

### **Embedded Systems Intern, Technophilia Systems, Mumbai, India**

**Jul 2014 – Aug 2014**

- Developed a real-time embedded software for a vehicle tracking system with GPS, accelerometer and GSM modules on ARM processor to improve accuracy of vehicle location by using sensor fusion algorithms.

### **Embedded Software Programmer, Tenet Technetronics, Bangalore, India**

**May 2014 – Jun 2014**

- Developed a low-cost automated obstacle avoidance system based on C using Atmega328 microcontroller to prevent crashes of remote-control toy cars using ultrasonic sensor.

## EDUCATION

### **Master of Science – Electrical Engineering**

University of Texas at Dallas, Richardson, TX

**GPA : 3.79**

**May 2020**

### **Bachelor of Engineering – Electrical and Electronics**

Visvesvaraya Technological University, KA, India

**GPA : 3.80**

**May 2016**

## OTHER PROJECTS

### **Adaptive Cruise Control (ACC) and Lane Centering for robot vehicle**

**Jan 2020 – Present**

- Developed Lateral and Longitudinal control of robot vehicle in C with PID controller and Ultrasonic Sensor on ATmega328 microcontroller. Calibrated the sensor and designed Kalman filter to determine the best State Estimation.

### **Self-Supervised Deep Learning-Based Speech Enhancement**

**Oct 2019 – Dec 2019**

- Trained Convolutional Neural Network model using MATLAB and Python for Speech enhancement in environments with machinery & babble noise without any clean speech (Self-supervised model).
- Optimized to improve Output SNR by 37.5% and reduced software latency to 56.4 micro-seconds.

### **Speaker Identification on Fearless Steps: Apollo 11 NASA Corpus**

**Nov 2019 – Dec 2019**

- Developed a speaker recognition model based on traditional Gaussian Mixture Model and Deep Learning Model using Kaldi tool (C++, python and shell scripting) to identify speakers, and increased Top-5 Accuracy by 10%.
- Implemented pre-trained i-vector and x-vector model for each speaker using NASA Apollo 11 Corpus Dataset.

### **Pedestrian recognition using Deep Learning**

**Feb 2019 – Mar 2019**

- Developed (Faster R-CNN) Deep-Learning based model using Keras framework for pedestrian recognition which was pre-trained on Nvidia GPU with KITTI vision Benchmark dataset to improve the software latency and accuracy.

## TECHNICAL SKILLS

**Programming/Engineering tools:** Embedded C, Misra C, C++, Python, Matlab, Simulink, Multisim, LabView, Android Studio, ETAS ASCET, ETAS ISOLAR-AB, Vector DaVinci, CANoe, CANalyzer, ETAS LABCAR

**Sensors:** Ultrasonic, IR, Camera, IMU, wheel speed sensor, steering angle sensor, RADAR

**Hardware:** Arduino, Raspberry Pi, FPGA, MSP430, Arm Cortex-M4, Atmel 8051, ETAS LABCAR (HIL testing)