

SARAYU MANAGOLI

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Currently seeking full-time opportunities starting May 2021 as Embedded Firmware/Software Engineer, Embedded System Engineer

EDUCATION

Master of Science in Electrical and Computer Engineering - Embedded Systems (Expected date of graduation: May 2021)
University of Colorado Boulder, Boulder, Colorado, USA

Courses: Embedded System Design, Embedded Interface Design, Wireless Local Area Networks **GPA: 3.83/4**
Principles of Embedded Software, Advanced Embedded Software Development, Concurrent Programming
Low Power Embedded Design Techniques, Internet of Things Embedded Firmware
Real Time Embedded Systems

Bachelor in Telecommunication Engineering (2013-2017)
BMS College of Engineering, Bangalore, Karnataka, India **GPA: 8.83/10**

RELEVANT INDUSTRY WORK EXPERIENCE

Software Program Developer (September 2017-July 2019)

Robert Bosch Engineering and Business Solutions Private Limited

- Handled various CAN frame related functional embedded C developments for Automotive Systems, involving commercial vehicles on SPC58NE84 microcontroller
- Was responsible for review and initial development of requirements for a Thermal System software module (part of the Engine Control and Management system); projects were based on JDP and IFX microcontrollers
- Verification and validation of various unit developments under different testing environments - including with Electronic Control Unit (ECU) hardware and simulation; analyzed and resolved system-level software bugs as part of projects that were advancing towards Series production
- Served as a primary developer for 4-button Cruise Control implementation introduced in an OEM. This involved handling inputs from Commercial Vehicle driver to select between various modes of cruise control
- Part of a 3-member taskforce formed to handle a system-level bug; this required taking charge of processes needed to be handled before Start of Production (SoP) of ECUs

Software Intern (June 2016-July 2016)

Asmatha Wireless Technologies Private Limited

- Worked on the software development aspect of implementation of "Aware Scheduling of Joint Millimeter Wave and Microwave Resources for Dual-Mode Base Station"

SKILLS

- Programming:** C (Windows and Linux), C++ and Assembly level languages with adherence to MISRA C
- Simulation tools:** ASCET, LogicPort(for logic analyzer), MATLAB (Beginner), Multisim, Emily52
- Design tools:** Altium, Inkscape, OrCAD, KiCAD, Draw.IO for UML designs
- Scripting languages:** Bash and Shell scripting, Make, Python (Beginner)
- Modification tools, Eclipse-based IDEs:** ECUWorx, AXESstar, MCUXpresso, Code Composer Studio, Simplicity Studio
- Task-handling tools:** Rational Dynamic Object-Oriented System (DOORS) and ClearQuest
- Testing tools:** Universal Debug Engine (JTAG), CANalyzer, ETAS Bus Master, KFlexExplorer
- Communication Protocols:** Controller Area Network (CAN), I2C, SPI, UART
- Software development process:** Agile, CMMI, Lean and ASPICE development models
- Version control systems:** SDOM, GitHub and GitLab
- Functional Safety Standard:** ISO26262
- Production processes:** FMEA and 8D Analysis
- Languages:** German language level A1 certificate holder

ACADEMIC PROJECTS

- “**Detection and Containment of SARS-CoV-2 in Assisted Living Spaces using BLE Mesh**” using **Blue Gecko** Low Power board, accelerometer, temperature sensor and other sensors.
 - Successfully designed and developed a BLE Mesh of 3 Bluetooth nodes which consisted of 2 Low Power nodes and one Friend node.
 - Integrated a temperature sensor which included the use of state machines to enable BLE modes.
 - Integrated a PIR sensor and an accelerometer on the friend and the low power node.
 - Documented and planned firmware reviews for the implementation.

- “**Biometric-based security system**” using a **Blue Gecko Low Power board, fingerprint sensor, IR sensor and Lithium Ion Battery**.
 - My role in this implementation is with respect to the design of the battery management system with the help of **PMIC (Power Management IC)** and a Lithium-ion battery, firmware development including sensor integration and testing of the system.
 - This project involves analysis of datasheets, selection of appropriate components, schematic design, PCB layout developments, hardware bring-up and reviews.

- “**Smoke Detection System**” on a custom-built **Linux** system using **Buildroot** on **BeagleBone Black** along with MQ-135 Gas sensor and TMP102 Temperature sensor
 - Assisted in setting up Linux Buildroot system for BeagleBone Black.
 - Integrated MQ-135 sensor by including analog pins in the existing device tree binary (DTB).
 - Implemented shared memory to accept data from both the above-mentioned sensors.
 - Improved the implementation by including socket programming to set up TCP communication between two boards.

- “**Time Lapse Image Acquisition**” on **Raspberry Pi** using Logitech C270
 - The main aspect of this project was to indicate that a Linux-based system can be used for real-time applications. Images were acquired in real-time at 1 Hz and 10 Hz.
 - Multithreading concept was implemented as various threads were created for tasks such as frame capture, image dump and image storage onto another RPi board using sockets.
 - Involved image processing of the captured frames.
 - Successfully used a sequencer which handled the time at which the semaphores had to be released for each of the threads.
 - The major take-away from this project was the Real-Time Operating System (RTOS) concepts.
 - Enhanced the standard project by establishing a connection between two Raspberry Pi boards.
 - Achieved a low jitter of 100 milliseconds.

- “**Hand Gesture based Recognition System**” using **MSP432**, flex sensors, graphical LCD and Bluetooth module.
 - This project was aimed to develop a system that accepts gestures to indicate some basic needs of the user and replicate the same in the form of an image onto the LCD for the interpreter to understand and do the needful.
 - Successfully integrated a graphical LCD to the system interfaced by SPI.
 - Developed firmware for gesture mapping.
 - Collaborated and performed several unit tests and system tests on the product.

- A completely functional embedded system was developed as a part of Embedded System Design course which involves programming of **SPLD, NVRAM, LCD device drivers, memory mapping**, etc. Projects are based on **MSP432 with ARM Cortex M4 and 8051** micro-controllers

- Projects based on **UART, I2C and FreeRTOS** are being implemented on FRDM KL25Z board which includes ARM Cortex M0 processor. The projects also build on concepts such as **ADC, DAC, UML State diagrams, circular buffers, MakeFiles, loggers and uC Unit test cases. FMEA, WBS** are also touched upon in the above-mentioned projects.