Sai Krishna Koniki

Embedded Software Engineer

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Objective

An initiative-taking and driven Embedded Software developer seeking to work on product side development and different microcontrollers with a focus on the Internet of Things and Machine Learning. Eagerly looking for an exciting opportunity where I can apply my work experience on Core embedded systems development, Internet of Things and Machine Learning.

Professional Summary

- Having 2.7+ years' experience in Embedded Software Development.
- Good knowledge and first-hand project experience in software projects by utilizing deep learning techniques to images or videos.
- Experience in building Machine Learning models.
- Project experience with Internet of Things (IoT) technologies and protocols such as MQTT and good knowledge on sensors / IoT connectivity, IoT platforms, and data acquisition.
- Solid knowledge and first-hand experience in C, C++, and Python.
- Experience with various communications protocols (e.g. SPI, I2C, USB, CAN).
- Experience on ARM-based micro-controllers such as STM32-Nucleo and others such as Nvidia Jetson Nano, Raspberry.
- Proficient in wireless communication protocols: TCP, HTTP, MQTT, CoAP.
- Basic experience and a good understanding of FreeRTOS and firmware development.
- Excellent oral and written communication skills, including the ability to produce clear and concise technical software documentation.

Work Experience

Vistronics Design Solutions *Feb 2017 - Present*
Embedded Software Engineer

- Collaborated with the team in each stage of the product development life cycle.
- Developed device drivers for multiple hardware platforms.
- Developed C/Python code for interfacing sensors with microcontrollers and implemented communication protocols.
- Report work progress through attendance of daily & weekly project internal meetings.

Technical Skills

- Programming Languages : C, C++, Python.
- Operating System : Linux, Windows, FreeRTOS.
- Tools/IDE's : Keil, STM Cube MX, JupyterLab, Spyder
- Communication Protocols : SPI, I2C, UART, CAN, USB and MQTT.
- Other Technologies : Machine Learning, Deep Learning, and IoT.

Education

- Pursued a bachelor's degree in **Bapatla Engineer College** in Bapatla with **7.01 CGPA**.
- Board of Intermediate from Bapatla Junior College with an aggregate of **86.7 percent**.
- Board of SSC from Viswasanthi Public School with an aggregate of **82 percent**.

Projects

Project-5: Quantitative Analysis of the performance of a multi-camera surveillance system for Face Recognition on Jetson Nano.

The main objective of the project is to analyze the performance metrics and benchmarks of a Jetson Nano development board in a Face Recognition System. The face recognition system incorporated with microprocessor to detect and recognize the faces in a real-time video streaming with the help of SDD Mobilenet network model with different pixel sizes of image such as SSD Mobilenet V-2 (300x300), SSD Mobilenet V-2 (480x272), SSD Mobilenet V-2 (960x544) and TensorFlow framework and aimed to identify performance metrics such as Power usage, inference speed, flexibility, ease of development, software support.

Hardware: NVIDIA Jetson Nano (TF-TRT), Surveillance camera.

Language: Python

Software Tools: CUDA, OpenCV, Matplotlib, TensorFlow and other Python Libraries.

CNN Models: CNN, Faster R-CNN.

Role:

1. Designed a Neural network model to train the dataset.
2. Interfaced a camera module to the micro-controller.
3. Designed an inference model to test and evaluated the performance metrics and benchmarks.
4. Involved at various levels of discussions of the project and its floor planning.

Project-4: ML approach for Engine Combustion Time prediction.

The aim of the project is to predict the time-series relation of in-cylinder pressure and crack encoder data of the combustion engine with the help of a support vector machine implemented in a raspberry pi platform. Earlier this prediction was done using Gaussian Distribution in MATLAB and the predictions are outdated. So, a Machine learning algorithm implemented to predict the time series and those predicted results are stored in a cloud using MQTT protocol.

Hardware: Raspberry Pi, Combustion Engine and pressure sensor.

Software: Linux, Machine Learning, JupyterLab, Internet of Things.

Language: Python.

Protocol: MQTT.

Role:

1. Built a Support Vector machine algorithm to predict the time series.
2. Implemented an MQTT protocol to communicate with the cloud and store the data.
3. Involved at various levels of discussions of the project and its floor planning.

Project-3: Fault detection system in rotating machinery.

This project was designed to develop a rotating machine fault diagnosis system based on vibration signals. The vibration acceleration transducer sensor collects the data from x, y, and z-axis and displays it in LCD. A Free RTOS was used to ensure real-time safety data collection and assigns the task priorities according to their importance.

Hardware: STM32 Nucleo-F767ZI, H3LIS331DL Accelerometer transducer, LCD.

Language: C language

Software: Keil µ Vision, STM Cube MX.

Protocols: I2C, FreeRTOS.

Role:

1. Developed I2C driver functionality.
2. The implemented task scheduling algorithm for FreeRTOS.
3. Involved at various levels of discussions of the project and its floor planning.

Project-2: Radio Frequency data acquisition system on FPGA and STM-32.

Our primary objective with this work was to acquire RF signal data from the antenna through a conditional circuit and transmit it to PC via FPGA and STM32. An FPGA development board receives the RF data with high precision and high-speed pre-processes and transmits to STM32 using SPI protocol and STM32 transfers the signal data to PC which acts as the client.

Hardware: STM32 Nucleo-L476RG, ALTERA cyclone II ep2c5t144 and TLC85540 A/D Converter.

Language: C language

Software: Keil µ Vision.

Protocols: SPI, USB.

Role:

1. Developed a communication between SPI and FPGA using SPI protocol.
2. Developed a driver functionality STM32 to communicate with PC using USB protocol.

Project-1: An experimental locking mechanism for engines.

The main objective of the project is to manage the vehicle through an SMS. The STM32 microcontroller verifies for authentication of the person, if the person is authorized, the engine management system takes over. The keypad is used for authentication purposes and is interfaced with display to enter the password. 16x2 digital display is interfaced to display user-related information. Just in case an incorrect password is given three times then the engine gets locked and a buzzer will beep. This lock is discharged only if the GSM unit receives the messages from the registered mobile number.

Hardware: STM32 Nucleo-L476RG, GSM Module, Keypad, DC Motor, required sensors.

Software: Keil µ Vision.

Language: C language.

Role: Developed ADC driver functionality for STM32 and design a C code to interface with multiple sensors.

Declaration

I hereby declare that the details furnished above are true and correct to the best of my knowledge and belief and I undertake to inform you of any.

Date: (Sai Krishna Koniki)