SHANKAR MANNE

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## Senior Software Engineer

A strong embedded software developer with 19yrs of experience with good debugging skills, third party software package integrations with good and strong software configurations.

### Areas of Expertise

|  |  |  |
| --- | --- | --- |
| * Embedded Computing Platforms * Firmware Development * Third party integration and software configuration | * Bare metal programming * Low-Level Drivers * Debugging * Communication Protocols |  |

### Technical Skills

**RTOS:**

* FREERTOS
* Azure ThreadX RTOS on STM32L4 Platform
* Azure ThreadX RTOS on Renesas Platform
* eCosRTOS on CYCLONE III FPGA.

**Languages:** C (Embedded,), Assembly., Python Script

Testing Scripts and Tools: Shell scripting, AT Commands for Modem communications, python scripts, java scripts, CAPL scripts, VB scripts

**Embedded Technologies:**

* BMS (Battery Management System) in Automotive Domain
* Fieldbus Protocols in Industrial Domain (Both IP and serial communication Protocols)
* Instrument Cluster Development in Automotive Domain.

**Technologies Wired Communications:** RTOS, Protocols like **J1939**, ModbusTCP, Modbus RTU, PROFINET IO, I2C, SPI, UART (RS232/RS485), CAN, LIN, Crypto Algorithms implementation such as, CRC and Base-64 Encode, and Decode.

**Peripherals:** CAN2.0, RTC, LCD (Graphical & Character), Memories (Flash, serial EEPROM, serial flash, RAM, Combo),

**Controllers(last 10 years):**

* CY8C6347BZI-BLD53(PSoC6 BLE Pioneer kit)
* CY8C4245AXI-483(PSoC4)
* Infenion TC23XX/TC27XX
* TMS570LS1224
* STM32F446RE
* R5F563XX(RX63N platform)
* CYCLONE III FPGA

**Compilers:**

* PSoC Creator 4.2
* TI Compiler using Code Composer Studio 8.2
* IAR EW Compilers using Renesas RL, Rx platforms
* NIOSII compiler for CYCLONE III processor.

**Emulators & Debuggers:**

* Segger J-link
* JTAG
* minicube
* PCAN
* CANOE
* CANALYSER

**Lab Tools:** Digital CRO, Pulse Generator, Logic Analyzer.

**Version Control:** GIT,BITBUCKET**,** JERA**,** Jenkins, Clear Case & Clear Quest

**Protocol Analyzers: Wireshark analyser,** CANOpen - CANalyzer (Vector Tools), MODBUS – ModSim.

**Review Tools:** Code Collaborator.

**PLC Tools:** Siemens, ABB.

### Professional Experience

LTTS Peoria IL USA 12/2023 – Till Date

Technical Lead (12/2023 –Till Date)

* Project 1 (STRATTEC Security Milwaukee WI)
  + ADPSteeringWheel Project

KEY ACCOMPLISHMENTS

* To create framework with PSoC6 BLE Pioneer Kit with the following components:
  + Sunlight Readable TFT display to play gif animations as LOGOs of different OEM
  + CapSense module to integrate steering wheel buttons and sliders.
  + SD card module to store the image files
  + MP3 Trigger module to play mp3 tracks which are mapped to steering wheel buttons and sliders.
* Completed the project in 3 months without delay.

ARi, Peoria IL USA 07/2023 – 12/2023

Senior Embedded Software Engineer (07/2023 –12/2023)

* Project 1 (Contract with John Deere)
  + Device Driver updates and code fixes for Infenion TC23xx, TC27xx)
  + Updating the TC23xx, TC27xx pinout configuration
* Project 1 (Internal Embedded Hypervisor)
  + XEN Hypervisor
  + Creating framework using XEN hypervisor using NXP platform
* Project 1 (Contract with Lippert)
  + Mazda Trailer LED blink not in sync
  + NXP microcontroller

KEY ACCOMPLISHMENTS

* To understand the architecture used in Caterpillar for communication over J1939 and Ethernet.
* To fix the issue related to Lippert Mazda Trailer LED sync issue
* To Create the Framework for Embedded Hypervisor using XEN hypervisor

NIKOLA MOTORS, AZ USA 04/2023 – 06/2023

Senior Embedded Software Engineer (04/2023 –06/2023)

* Working as part of BMS (Battery Management System) Application Software Team.
* Working on updating the test frameworks consisting of CAPL scripts with Canoe Tools.
* To parse and save the specific J1939 data (PGN/SPN) data to NVM.

KEY ACCOMPLISHMENTS

* Writing UART drivers for the controller to interface the EEPROM with HMI.
* Maintaining and updating the Application Software for BMS ECU.
* Porting the legacy software from TI microcontroller TMSSL5701224LS1227 to Infenion Micro TC389.
* Working on different application modules like
  + CAN module
  + NVM (EEPROM) module
  + Flood sensor
  + SOC/SOH/SOP modules
* Understanding the different BMS architectures available.
* Updating the CAPL scripts for existing test frameworks.
* Updating the python scripting for auto generation of test frameworks.

Grundfos Pumps 03/2020 – 08/2021

Senior Software Engineer (03/2020 – 08/2021)

* Work on updating and new platform components development.
  + UART components
  + Modbus RTU
  + Modbus TCP
  + Hardware configuration and port test components
* Support in solving integration and field level issues mostly related to Modbus, UART and network connection issues related to LTE connections for Modbus.

Grundfos Pumps 11/2011 – 12/2017

Senior Software Engineer (11/2011 – 12/2017)

* Design, Develop, Implement porting of Fieldbus protocols from serial communication to IP (Industrial Protocols) like ModbusTCP, PROFINET IO.
* Develop complete GSDML configuration files for PROFINET IO and support for protocol conformance testing and market deployment.
* Porting, Development and supporting of GRM(Grundfos Remote Management) from 2G/3G network to internet network.
* Integrate WolfSSL security package and implement OTA (Over the Air) software update securely.
* Support in solving field critical issues.

KEY ACCOMPLISHMENTS

* Develop complete GSDML files from scratch for PROFINET IO configuration to support for product communication with different PLCS including Siemens, ABB and be in line to get protocol conformance test pass and get the product certified.
* To work with eCos RTOS and NOISII IDE which supports for the product development.
* To design and develop memory management to in-corporate multiple protocols in a single board and work accordingly whenever a different fieldbus protocol is selected with a protocol selector and not to effect the other protocols configuration whenever the selection is changed.
* Integrate WolfSSL Security package to have a secure internet connection whichever is supported.
* Created webpages to support the production and service people to configure or troubleshoot any possible situation which could help for solving or study purpose for future course.
* Created PLC programs and frameworks to support ModbusTCP and PROFINET IO to simulate the market conditions.
* Developed local and secured OTA.
* Developed python scripts for automated multiple software updates and certificate updates for TLS communications.

Visteon Technical Service Center 09/2005 – 10/2011

Senior Software Engineer (05/2005 – 10/2011)

* Design, Develop, Implement software for Automotive Instrument Cluster.
* Support for in-market software requirements for North, South America, Asia-Pacific, Europe regions related to Instrument Clusters.
* Software Implementation and support for OEMS like FORD, NISSAN, General Motors.

KEY ACCOMPLISHMENTS

* Work on Instrument gauges like Speed, Fuel, RPM.
* Work on Configuration files for Gauges for desk testing and for production support.
* Work on controller sleep cycles to maintain and save battery life.
* Work on configuration of CAN HS/MS
* Work on CAPL scripts for testing and market issues.

LARSON & TOUBRO LIMITED 05/2005 – 08/2005

Software Engineer, Embedded Systems & Software Division

* Worked on preparing framework for passing commands via IPC in Linux environment.

CG-Smith INDIA PVT. LTD. 11/2004 – 05/2005

Software Engineer

* Worked on implementing, updating test frameworks for software.

CENTRONIX 9/2003 – 05/2004

Software Engineer (Trainee), Embedded Systems

* Completed projects on time and within budget, ensuring the applications complied with client requirements.

NET INDIA PVT. LTD. 9/2001 – 10/2004

Software Engineer(Trainee), Embedded Systems

* Completed projects on time and within budget, ensuring the applications complied with client requirements.

KEY ACCOMPLISHMENTS

* Gained valuable experience firmware design and development activities in Telecom/Embedded Networking domain.

### Education & Certifications

**BE in Electronics and Communications**

RTEREC Hulkoti, Karnatak University Dharwad, India(passed out in 2000)

*PCEP Certified*