Sandesh Kumar

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PROFILE SUMMARY

- ⇒ 5+ years experienced in developing Embedded design applications.
- ⇒ Knowledge of software development in AUTOSAR and non-AUSTOSAR architectures.
- ⇒ 2+ years of experience in Automotive Powertrain Control Module (PCM) and Battery Management System (BMS).
- ⇒ Experience in Base Software Development (BSW) of Diagnostics Event Manager (DEM) and Diagnostics Communication Manager (DCM) module.
- ⇒ Experience in reading the vehicle diagnostic data & analysis of the UDS and OBD II protocol standards.
- ⇒ Expertise in C, C++ and Object-Oriented Methodologies.
- ⇒ Experience in end-to-end Automotive and Embedded software development life cycle such as Design, Coding, Integration, Verification and Validation of the Software and releasing the software withing the deadline.
- ⇒ Having working knowledge of communication protocols like CAN, UART, SPI, I2C.
- ⇒ Software development debugging and data logger tools like Eclipse, JTAG debugging, Source Insight, Trace32, ETAS INCA.
- ⇒ Knowledge of data analysis and configuration using vector tools like CANOe, Canalyzer, GENy, DaVinci configurator etc.
- ⇒ Experience in Developing the software as per MISRA coding rules & ISO 14229 standard diagnostics.
- ⇒ Be involved in all phases of product development processes from requirements definition to production release, metrics data collection and reporting.
- ⇒ Working knowledge on software version control tools like Accurev, RTC, IBM Synergy and Rational Change.
- ⇒ Requirements gathering, Design, Implementation and Unit Testing of new application/features.
- ⇒ Well versed with methodologies like Waterfall, Agile, scrum.
- ⇒ Excellent communication, analytical and presentation skills with ability to work both in a team and individually.

SKILLSET

Configuration tools	Vector DaVinci configurator, ETAS ISOLAR, Dspace System desk, Vector GENy, Vector CANOe, Vector Canalyzer, Vector CandelaStudio, Matlab.
IDE and Debuggers	Eclipse Luna, Source Insight, Lauterbach Trace32, IAR Debugger
Programming Languages	Embedded C , C++.
Test Equipment's	Oscilloscopes, Multimeters, Power Supplies, Signal Analyzers, Logic analyzers, Network protocol analyzer.
HDL and HVL	VHDL, Verilog
Version Control & Repository	IBM Synergy, IBM RTC, Accurev, SVN
Applications and OS	Microsoft Office including Excel, PowerPoint etc., Windows 10 and Linux

TECHNICAL WORK EXPERIENCE

1#Project   **: Powertrain Control Module (PCM)**
Client   **: Fiat Chrysler Automotive, USA (TechnoSquare Inc)**
Duration   **:** Jun 2019 to till date
Description   **:**   PCM completely manages the Engine control and Transmission control. Involved in Engine control ECU, worked on Diagnostics module. Diagnostics consists of DEM, DCM and FIM. DEM takes care of DTC/Event handling, MIL, OBD II features like IUMPR, event memory displacement. DCM involves in UDS services like read/write DID, Routines, IO control, Clear Diagnostic information etc. and OBD service like Mode 01, 04, 06 etc. Developed according to CARB regulations for OBD features and OEM specific requirements.

Responsibilities:
- ⇒ Requirement gathering and understanding its requirements of AUTOSAR BSW modules of diagnostics (DEM, DCM and FIM) of powertrain control unit.
- ⇒ Understanding the requirements of ISO and OEM specific requirements of Diagnostic protocols – UDS and OBD II Services.

- ⇒ Configuring BSW for Diagnostics module in AUTOSAR architecture for UDS and OBD services in ETAS BSW configurator – ETAS ISOLAR and Vector Da Vinci configurator.
- ⇒ Generating RTA- BSW and RTE and debugging to resolve the RTA and RTE build issues.
- ⇒ Development of AUTOSAR compliant CDD components and Application software components for OBD.
- ⇒ Working with integration team to integrate application components and Base Software and release the software build release.
- ⇒ Implementation of Diagnostic features in Embedded C.
- ⇒ Validating and debugging the functionalities of Diagnostics services and features for DEM, DCM and FIM using the tools such Lauterbach Trace32, CANOe, Canalyzer and Chrysler Diagnostic Analyzer (Diagnostic Tester).
- ⇒ Reviewing Design, Code implementation and test plans.
- ⇒ Worked as SCRUM master in AGILE methodology and involved in Big room & sprint planning and resolving issues in cross functional teams for PCM software development.

Environment: NXP COBRA-55 MPC5777B/C Microcontrollers, Embedded C programming, Vector DaVinci Configurator, ETAS ISOLAR, DSpace System Desk, Vector Candela studio, CANOe, Canalyzer, Trace32, DIAB Compiler, Matlab Models, MS-Visio, IBM RTC and Accurev.

2#Project : **Battery Management System (BMS)**
Client : **Fiat Chrysler Automotive, USA (TechnoSquare Inc)**
Duration : Jan 2018 to Jun 2019
Description : BMS is one of the many ECU's of Electrified Powertrain vehicles. This product completely manages the Battery pack of the vehicle and monitors the charge and discharge through balancing techniques. It consists of BPCM (Battery Pack Control Module, which monitors and controls voltages and current of Battery pack, cell voltages, cell module temperatures, contactor control, Ignition control etc. and CSC (Cell Supervision Circuit), which measures the cell voltages, current and temperatures and does cell balancing during runtime and at power down and monitors the cell faults like over and under voltages, over and under temperatures, ground loss, communication error etc. The BPCM is designed using COBRA-55 microcontroller and CSC using NXP MC3377x microcontroller, which can measure 14 cells.

Responsibilities:
- ⇒ Understanding the CSC requirements and developed a CSC system Design.
- ⇒ Responsible for implementation of CSC module from scratch based on requirements.
- ⇒ Developed the state Machine for CSC.
- ⇒ Involved in implementation of UDS Diagnostics as per the Powernet Architecture requirements.
- ⇒ Generated the CAN communication stack using Vector GENy.
- ⇒ Created DDT and worked on CDD to test the DIDs and RIDs using CDA Tool.
- ⇒ Code optimization and Debugging using Trace32 and INCA.
- ⇒ Coordinated with the team for requirement analysis and design development for CSC and UDS diagnostics.
- ⇒ Involved in software build and release.

Environment: NXP COBRA-55 MPC5777B/C Microcontrollers, NXP MC3377x Microcontroller, C programming, DIAB Compiler, Matlab Models, MS-Visio, IBM Synergy and Rational Change management, Prototype of ECU.

3#Project
Company : **TechnoSquare**
Title : Embedded Software Developer - Intern
Duration : Sep 2017 to Dec 2017
Description : As an intern, involved in requirement gathering and understanding for multiple inhouse projects. Learnt on vehicle diagnostics of UDS and OBD standards. Worked on board bring up and worked on EEPROM module implementation and unit testing.

Responsibilities:
- ⇒ Worked on requirements gathering and understanding for multiple inhouse projects.
- ⇒ Creating software design workflow and documentation based on the requirements.
- ⇒ Developed EEPROM implementation and validated the bench testing.
- ⇒ Worked on software change requests for diagnostics components.
- ⇒ Involved in understanding CARB regulation for OBD II.
- ⇒ Debugged and fixed software defects.
- ⇒ Understanding the Diagnostics standards like UDS and OBD protocols.

4#Project
Company   : **TATA Communication Transformation Services, India**
Title   : Telecom Test Engineer
Duration   : Jun 2013 to May 2015
Description   : Worked on various Telecom and Teleservices Product firmware software. Primarily involved on software integration for various modules for the software update releases of the communication broadcast receiver and transmitter products. Validation of the softwares based on the test plans and analyzed the results before the update releases.

Responsibilities:
- ⇒ Understanding the requirements and system level software design of the software change request.
- ⇒ Developed and worked on code changes for change requests for various telecom and server equipment's software.
- ⇒ Responsible for software integration and creating software baseline/snapshot for the releases.
- ⇒ Unit testing and functional testing were done the change request software development.
- ⇒ Validated the software based on Test plans and Test cases and analyzed the results.
- ⇒ Debugged the software, analyzed the root cause and fixed the software defects/ bugs.

EDUCATIONAL

Texas A&M University at Kingsville, Texas, USA   **Graduation: May 2017**
M.S., Electrical Engineering (Embedded System Design and VLSI)   **CGPA: 3.5/4.0**

Anna University, Chennai (MNMJEC), Tamilnadu, INDIA   **Graduation: Nov 2012**
B.E., Electronics and Communications Engineering   **CGPA: 6.61 /10**

ACADEMIC PROJECTS

1# Project   : **Vending Machine Controller**
Description   : Devised a controller software for a Vending machine, which controls vending of different products based on the user selection and other functioning like change returning. Designed the system using state machine concept using VHDL model and C++ programming.

Responsibilities:
- ⇒ Gathered the requirements and designed a system level flow of a vending machine.
- ⇒ Developed a finite state machine model and implemented in Altera cyclone-V FPGA device.
- ⇒ Schematic layout devised using Vivado IDE.
- ⇒ Developed and simulated the VHDL model and validated the output with test bench.
- ⇒ Synthesized the VHDL model to C++ code and integrated the additional functionality with generated code.
- ⇒ Generated the Register Transfer Level (RTL) schematics of the FSM model using Netlist viewer.

2# Project   : **Train Location System**
Description   : Passengers traveling by AC coaches will have more anxiety for alighting Station especially more in the night times. GPS based train location indicating system shall make the passenger more convenient by giving the information about Present Location of the train, Next Halt station with distance. The passengers shall be provided Alarm facility of their Alighting station.

Responsibilities:
- ⇒ System Software Design.
- ⇒ Implemented Serial communication using I2C protocol
- ⇒ Controlled Display of train status
- ⇒ Run the SOC validation tests and captured the observations and generated validation test reports.
- ⇒ Debug failing tests to root cause and work closely with design engineers to incorporate and verify fixes.
- ⇒ Updating Test Case documentation with observed results.