**CHARAN REDDY AKULA**

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# SUMMARY

* Around 5 years of experience in Automotive industry working on System Engineering, Software development and Testing.
* Experience in Requirement analysis and Architecture design using IBM DOORS and IBM DOORS Next Gen.
* Proficient in AUTOSAR ECU architecture and RTE.
* Highly proficient in Model based development (MBD) using MATLAB/Simulink.
* Programming experience in Embedded C for 16-bit and 32-bit microcontrollers.
* Good knowledge on MIL, SIL and HIL testing.
* Experience in using CAPL Script for programing CAN nodes and performing serial communication testing.
* Proficient in automotive communication protocols CAN, FLEXRAY, LIN, MOST and Ethernet.
* Proficient in developing communication drivers for UART, SPI, I2C and SENT protocols.
* Hands-on experience with CAN tools like Vector CANoe, CANalayzer, CANape.
* Sound knowledge on Unified diagnostic services (UDS).
* Utilized Linux OS expertise, including multi-threading, to develop stable and responsive embedded software.
* Proficient in using ASPICE 2.5, ASPICE 3.1, MISRA, ISO-26262 standards.
* Working Knowledge on Functional Safety (FuSa), HARA analysis and DFMEA.
* Experienced in using IBM RTC, IBM Jazz, IBM Synergy, Jira and Bitbucket for Change Management and Source Control.
* Experience working in both Waterfall and Agile methodology.

# EXPERIENCE

**Nexteer Automotive** Michigan, USA

**Embedded Engineer** August 2022 – present

* Design and development of Autosar based software for Electric Power Steering module.
* Working on System Requirements, Software Requirements and Architecture (SysML) using IBM DOORS and Enterprise Architect.
* Developing and Maintaining HW-SW interface document.
* Performing Safety Analysis, Dependent Failure Analysis and DFMEA to ensure accommodation of functional safety in accordance with ISO26262.
* Developing Application software by Model-based software development (MBD) using MATLAB/Simulink and Embedded C programming.
* Developing Autosar software components at application level using DaVinci Developer.
* Exhibited proficiency in administering and setting up Linux-based systems, maximizing test environments for IPC project specifications, and guaranteeing platform compatibility.
* Integrating and configuring 3rd party Basic software (BSW) like Vector stack (Diagnostic, Communication, Memory) and MCAL using DaVinci Configurator.
* Performing requirements-based MIL/SIL testing on the software component models.
* Working closely with HIL team to perform functional testing.
* Participating in System Software design and development reviews.
* Identifying Root Cause and Corrective Action for software issues by performing software debugging, bench level and vehicle level testing using Debugger, CANoe and CANape.
* Acting as Product Owner (PO) for one of the software teams and supporting Sprint planning.
* Representing software team in ASPICE and Safety Audits. Working closely with Quality team in enhancing process according to ASPICE.

**Mahindra Electric Mobility Limited** Hyderabad, India

**Embedded Software Developer** January 2019 – July 2021

* Working on high level Requirements analysis and developing Architecture design per ASPICE requirement management process at system level.
* Model based AUTOSAR software components designing for using MATLAB/Simulink.
* Performing requirements based MIL testing on the software component models.
* Developing Functional Safety Requirements based on Technical Safety Requirements and Safety Goals.
* Working closely with FuSa team and supported HARA and Safety Goal reviews from software side.
* Developed Hand-coded algorithms using Embedded C programming language.
* 3rd party complex software driver integration and configuration.
* Utilized Linux-based development environments to create scalable and maintainable software solutions.
* Written unit and integration level test cases based on requirements in Doors.
* Performed on-bench and in-vehicle functional testing using debuggers and Vector tools.
* Analyzed the data collected from the vehicle using playback models and wrote the reports incorporating results and recommended the software changes. Debug integration issues within core models and controller code.
* Developed product release documents and participated in multiple customer demos.

# TECHNICAL SKILLS

**Education**

Embedded C MATLAB/Simulink C++

CANoe CANalyzer CANape

Enterprise Architect

IBM Doors

IBM Doors Next Gen IBM Rational Rhapsody

RTC

Tessy

Bitbucket

Trace 32 MULTI

KEIL compiler IAR workbench Eclipse Arduino

Green Hills

Jira

Linux Kernel

PythonScript CAPL Script

MS Visual Studio MS Office

MS Project

**Master’s Degree** in Electrical Engineering from **Northern Illinois University**, USA August 2023.

**Bachelor’s Degree** in Electronics and Communication Engineering from **BML Munjal University**, India June 2019.

# Certifications

* + Automotive SPICE V3.1 by MethodPark
  + ISO 26262 Automotive Functional Safety by Udemy
  + Advanced Driver Assistance Systems (ADAS) by Udemy
  + Systems Modeling Language (SysML)

# ACADEMIC PROJECTS

### **Switching Power Converters**

* Developed a converter circuit utilizing Power Mosfet and Diode components, with a range of gate resistances.
* Investigated the impact of gate resistance (1k, 10k, 1M) variation on conduction and switching losses.
* Conducted assessments to determine output voltages across different duty cycles (10% - 90%).

### **Simulation of a Three-Phase Inverter using Simulink**

* Designed a three-phase voltage source inverter using IGBT as switching devices with a 400 V DC input, achieving a 10 kW, 230 V AC while maintaining a 95% efficiency.
* Implement a Pulse Width Modulation (PWM) control strategy to generate the three-phase AC output waveform.

### **Study of SiC MOSFETs for Inverter applications and current technologies**

* Conducted an extensive study to compare the performance characteristics of SiC MOSFETs, GaN FETs, and Si IGBTs for electric vehicle (EV) inverter applications over 100kW.
* Analyzed key parameters such as switching speed, on-resistance, capacitance, and thermal conductivity to understand the advantages and disadvantages of each component.