

## TEK012045 (Embedded Systems Development - 9 + Year)

■ Masters of Engineering

### Highlights

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- Have Good Experience in the automotive controls embedded software development and calibration / testing area in Autosar Classic environment,
- Embedded hardware and software design, control theory, algorithm design, Functional Safety (ISO26262), design reviews, issue resolution, and unit testing and test automation, FreeRTOS
- Successfully cleared the IKM Embedded C Programming scored
- Familiarity with agile software development, using tools like JIRA, Azure Devops, GitHub, Jama

### Skills

#### Primary Skills

- C Programming
- Embedded Programming

#### Secondary Skills

- Debugging Tools (JTAG, Logic Analyzers)
- Protocols (SPI, I2C, UART, CAN)

#### Other Skills

- **Programming Languages** : MATLAB, Simulink Stateflow, Embedded C, C++, Python, Selenium Webdriver Python, Linux, SQL
- **Hardware Debugging Tools** : JTAG, Logic Analyzers, Oscilloscopes
- **Communication Protocols** : I2C, SPI, UART, CAN, Ethernet
- **Engineering Tools** : MATLAB/Simulink/Stateflow/SimDriveline/Simscape Power Electronics/Simulink Control system Design, Dspace Targetlink, RTW Embedded Coder, CANalyser, Labview, Microsoft FTIDE, Log Analysis Tool, PikeTec TPT, Reactis, m-scripting, Msc ADAMS, Trace32, Autonomie 2011, Embedded C/C++, Python/Pytest/Slash/Python socket scripting, Ceedling, Polyspace, Power Automate Flow/Selenium Webdriver Python, Jenkins, VBA scripting, Linux programming, SQL
- **Requirement Management Tools** : IBM DOORS, Jama
- **Configuration Management Tools** : IBM RTC, Tortoise SVN, Serena PVCS, JIRA, Azure Devops, GitHub

## Projects

### Project - 1 (22 months)

**Role : Software Developer**

#### Responsibilities :

- Working under the Body control Module division- VMCU- Battery Management systems team, am responsible for requirement based controller modeling and model optimisation using MATLAB/Simulink/Stateflow based on AUTOSAR standard, performing RTW Embedded Coder- code generation, scripting/unit code testing in Embedded C .
- Handling the verification and validation activities like identifying and creating new test suites using ceedling unity tool, using Jenkins automation for the activities
- Performing SIL testing, analyzing results and debugging issues in unit models, source code and tests suites, Polyspace MISRA static code analysis
- Developing automation test cases using Python/Pytest/Slash/Python socket scripting for Jenkins CI/CD pipeline, for different BMSys applications across the vehicle series for various FNV4 software releases.
- Created and executed unit tests using ceedling unity tool and Jenkins automation, performing SIL testing and debugging issues in unit models and source code written in C.
- Unit test automation using ChatGPT AI to automatically generate unit test cases from uploaded Source Files.
- Automating ChatGPT interactions through Power Automate Flow/Selenium Webdriver Python script
- Working under the Cummins- DCDC Convertor team, understanding the reference design and system architecture documents
- Responsible for requirement based controller modeling and debugging model simulation issues using MATLAB/Simulink/Stateflow/ Simscape Power Electronics/Simulink Control system Design and Tuning/Frequency Response and Transfer function estimation for the DCDC Convertor Power Electronics Model, performing RTW Embedded Coder- code generation in Embedded C.
- Developed Board bring up process for the ST-Micro Eval kit, using vendor provided IDE for debugging/flashing binary on target MCU, CAN and LIN communication testing using CANalyser, Labview for BMSys application. ADC/Timer SDK config as per FreeRTOS.
- Project planning, estimating the work & coordinating with counterparts in US for all technical discussions.
- Following Agile development methodologies, used JIRA/Azure Devops for sprint planning, Github

### Project - 2 (39 months)

**Role : Tech Lead**

#### Responsibilities :

- Working under the Body control Module division- Vehicle Starting Control systems team, was responsible for requirement based controller modeling and model optimisation using MATLAB/Simulink/Stateflow based on AUTOSAR standard, performing RTW Embedded Coder- code generation, unit model testing.
- Handling the verification and validation activities like Model Integration, identifying and creating new test suites using FTIDE/Reactis tool, using Jenkins automation for the activities, performing MIL, SIL testing, analyzing results and debugging issues in Plant models and tests suites, for different vehicle starting control feature applications across the vehicle series for various software releases.

- Analysed requirements to create system architecture models, automated the process in VBA
- Project planning, estimating the work & coordinating with counterparts in US for all technical discussions.
- Completed certificate trainings on Agile and Lean Six Sigma development methodologies

### **Project - 3 (9 months)**

#### **Role : Advanced Engineer**

#### **Responsibilities :**

- Working under the Body Control Module division- body electronics application tools team, was responsible for controller modeling and library development of models using MATLAB/Simulink/Stateflow based on AUTOSAR standard, model upgradation from R16 to R17
- Performing Dspace Targetlink- code generation, MIL, SIL testing using TPT tool, and debugging issues in models and tests, for different S, E and C- Class vehicle series Infotainment cluster applications.
- Coordinating and supporting the German counterparts and the application team

### **Project - 4 (19 months)**

#### **Role : Senior Software Engineer**

#### **Responsibilities :**

- Working in the Model based design area, under the Chassis Control Module division- vehicle dynamics systems team, was responsible for controller modeling using MATLAB/Simulink/Stateflow, model upgradation from R06 to R15
- Performing Targetlink- code generation, MIL, SIL testing and debugging issues in models and tests, for different JLR chassis control applications.
- CAN and Flexray communication testing using CANalyser for Convertor Box application.
- Project planning, estimating the work & coordinating with customer.
- Customer coordination and offshore team central point of contact for all technical discussions & mentorship

### **Project - 5 (16 months)**

#### **Role : MBD / CAE Modeling Engineer**

#### **Responsibilities :**

- Performed modeling and simulations of MultiBody Dynamics models for vehicle dynamics analysis as per requirement of different projects using Msc Adams.
- Performed co-simulations with Matlab/Simulink models.
- Modeled the front McPherson suspension template for the Jeep Cherokee in Adams/Car and validated suspension analysis results.
- Performed rigid to flex chassis conversion for the new D-class sedan & Jeep Cherokee, and analyzed full vehicle analysis results in comparison to rigid body in Adams/Car.
- Analyzed the effect of variation of UA-tire parameters on output long force/slip in Adams/Car.
- Measured the driveline displacement, forces & acceleration through requests created in Adams/View for the Ram 2500 truck.
- Created Excel spreadsheet to be used as a tool for chassis load location calculation, used Adams/Car to validate results.
- Also created an Excel spreadsheet for automatic calculation of the output transmission torque for a torque convertor mechanism.
- Also developed other technical documentation as per requirements of the project.

- Underwent training on vehicle dynamics theory offered by IIT Madras.
- CAE Modeling: Was responsible for meshing BIW and plastic components as per project requirements using ANSA.

## **Project - 6 (12 months)**

**Role : Graduate Research Assistant**

### **Responsibilities :**

- "Front/Rear Axle Torque Split Limits for Vehicle Stability Control"
- Used MATLAB/Simulink/SimDriveline to create a vehicle dynamics plant and controller model.
- Performed simulations during acceleration and deceleration to analyse and determine limits on the vehicle controller for torque splitting between front and rear axle to prevent the vehicle from slipping at longitudinal and lateral motion with and without differential braking system engaged.

## **Awards**

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- Received Silver Medal for being Second in academic performance in the mechanical and automation engineering department
- Achieved first position in German language class throughout bachelor's degree