

AVESH SHAH

11 Village Circle, Apt 204, Rochester Hills, Michigan, USA -48335 • (864) 991 6480 • aveshshah@gmail.com

Education:

Master of Science (MS) Automotive Engineering (GATE Fellow)	Clemson University- International Center of Automotive Research	2012-2014	3.57 GPA
Bachelor of Technology; Mechanical	National Institute of Technology, Jaipur	2005-2009	8.37 GPA

Software skills: Matlab/Simulink/Stateflow, Python, Cpp(reading and debugging) , CAN Communication, ROS2, Docker, Json/yml

Hardware skills: DSpace (Microprocessors and IO boards) , ETAS-INCA, Canape, CANAlayser, , Motohawks, Ecotrons

Controls Skills: Kalman filters, Linear quadratic optimization, Feedback Control

Management tools: CI/CD, Git/Azure, Agile, Polarion

Team management experience - 3 years

Academic Knowledge: Applied Machine Learning using Python (certification)

Current Employment: Magna International (Troy, Michigan)

April 2024- Present

Designation : Sr. Software Engineer

Functions:

- Model based controls development for Longitudinal and Lateral controls of 3 wheeled robot
- Support Software development for Gateway module using ROS2 and Docker
- Leading Autosar model development

Major Project:

- Worked on IMU development to measure corrected accelerations and calculate Roll and Pitch of the vehicle
- Worked on development of Longitudinal control of a 3 wheeled autonomous robot to run it on a desired speed considering power and acceleration constraints. Developed EKF based vehicle speed and heading estimation using Wheels speeds, IMU and GPS data.
- Worked on development of lateral model to correct the curvature of the robot and to limit the velocity of vehicle while taking turns to avoid rollover. Used Roll over index to provide steering impulse to control the roll moment.
- Worked on GNSS development using python ,utilizing moving base and rover and applying correction over NTRIP caster to provide centimeter level accuracy. The data was transmitted over the ROS2 topic from Docker container.
- Worked on Speaker software development , using python ,to develop Audio alert and audio advertisement playback and mixing. Developed APIs with CODEC (over I2C) in python to provide access to the Docker containers
- Worked on Microphone API development to interface with CODEC (over I2C). Also developed a ML model to detect Emergency vehicle approaching by using transfer learning method, using Yamnet model as a reference.

Past Employment: Dana Incorporated (Novi, Michigan)

January 2023- April 2024

Designation : Technical Lead

Functions:

- Lead Technical meetings with Customer and execute decisions on Implementation and timelines.
- Leading product development process from application software point of view following AUTOSAR and ASPICE
- Support Team members in logic development , provide feedback and conduct reviews
- Participate in cross functional team meetings and workshops and act as a bridge to fulfill team needs

Major Project:

- Leading the ASW development activities for 2 speed BEV Transmission for an OEM.
- Managing a team of 6 members in AUTOSAR work flow development fulfilling the path for ASPICE

- product development process.
- Leading Technical areas such as Fault handling, Thermal and Lubrication controls and Gearbox Torque path management .

Past Employment: FEV North America(Auburn Hills, Michigan)

October 2018- January 2023

Designation : Senior Controls Engineer/Technical Lead Engineer

Functions:

- Keeping requirements (Use case development) align with Algorithm for various platforms focusing on Torque path control.
- Tactical Feature development including cost based Optimization (predictive control) enhancement and Physics based equations deployment
- Leading the technical discussions in workshops with suppliers
- Develop/modify Tactical torque path logic to achieve desired functionality such as creep, torque split optimization, shift energy management, coast and regen torque interface implementation etc

Major Project:

- Leading from Tactical domain on torque path requirements development for a Hybrid Dual Clutch Transmission system and a full Hybrid PHEV.
- Supported on Engine start and idle control profiling using full feedback LQR and performing fast path actuation for minimizing actuation delays and close loop torque
- Worked on designing e coasting and regenerative braking interface with brake module to perform smooth operation during gear shifts.
- Worked on dual path shift intervention logic between hybrid, trans and engine controller.

Past Employment: Hybrid Design Services Inc.(Troy, Michigan)

December 2016- October 2018

Designation : Controls Engineer

Functions:

- Utilizing Matlab/Simulink and related modeling tools to develop controls for a variety of hybrid-and electric-vehicle applications.
- Performing vehicle modeling and simulation activities to predict performance and efficiency.
- Developing or modifying vehicle controls systems which include electric propulsion, chassis controls and battery management systems.
- Utilizing off the shelf controllers to implement control solutions for BMS and BDU development, vehicle modification as well as Testing.

Major Projects:

- Worked on Development of Control algorithm using Simulink and Stateflow to optimize Hybrid vehicle performance at 10KW higher load requirements. Development of CAN communication network with vehicle Controller. Also performed Calibration and testing of Model using Moto hawk Controller
- Worked on a project to build a control strategy for prototype Battery management system and supported features such as SOC estimation using Kalman filter(EKF), Contactor control, Power limit calculation etc to integrate and demonstrate with an energy storage system.
- Worked on development of a supervisory control that can log data from DLC port of an electric dump truck, transfer files using FTP to a secure server and alert passenger when a fault is detected.

Past Employment: General Motors (Contract), Pontiac, Michigan

August 2014- December 2016

Designation : R&D Test system implementation engineer

Functions:

- Understanding of Gasoline and Diesel Engine controllers. Implementation of Prototype ECU for Research Engines.
- Development of CAN communication code as well as controls on Matlab/Simulink and LabVIEW for Test engines.
- Creating/modifying FPGA models in Labview along with SCM or Veristand interface.

Major Projects:

- Worked on Test cell instrumentation and commissioning of both Gasoline and diesel Engines.
- Worked on development of Simulink model for Gasoline Engines open loop controller to run on DSpace for Test cell operation.