AVESH SHAH
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Website: www.avesh-shah.com

Core Skills

- Software: MATLAB/Simulink/Stateflow(8/10), Python(7/10), C++ (4/10), ROS2, Docker, Labview, JSON/YAML
- Communication: CAN, LIN, I2C, Automotive Ethernet
- Controls: Kalman Filters, Particle filter, LQR/LQI, Optimization, Feedback Control
- Hardware: DSpace, INCA, ETAS, MotoHawk, Ecotrons, National Instruments
- Tools: Git/Azure, CI/CD, Polarion, Doors, SysML, Agile, Autosar
- Management: 4 years team leadership, technical reviews, OEM customer engagement
- System Requirements : 3 years with Requirement generation, reviews, system flow diagrams, Electrical architecture, DVP&R and Fault tree analysis

Education

- M.S., Automotive Engineering (GATE Fellow) – Clemson University,
- GPA 3.57 (2012–2014)
- B.Tech, Mechanical Engineering – National Institute of Technology Jaipur, GPA 8.37 (2005–2009)

Professional Experience

Magna International – Troy, MI | Apr 2024 – Present

Sr. Software Engineer

- Developed EKF-based estimation framework for vehicle Vx, Vy, heading, and pose, fusing IMU, GPS, and wheel speeds.
- Implemented IMU line calibration to remove bias; developed roll/pitch estimation using both Kalman and Madgwick filters.
- Designed lateral control strategy to prevent rollover by using rollover index, limiting lateral acceleration (rigid body assumption), and steering impulse.
- Designed Longitudinal control to provide Acceleration/Deceleration and steering commands, DC-DC power, Range estimation and Regeneration blending.
- Generated calibrated steering map and used it with waypoints to control curvature.
- Implemented GNSS moving-base rover corrections via NTRIP caster for cm-level accuracy integrated in ROS2/Docker pipeline.
- Built audio pipeline with ROS2/Python, including audio alert/advertisement mixing and ML-based siren detection using YamNet transfer learning.
- Worked on features such as Mass and Grade estimation using RLS, delivering 10% error margin.

Dana Incorporated – Novi, MI | Jan 2023 – Apr 2024

Technical Lead

- Directed AUTOSAR ASPICE-compliant ASW development for BEV transmissions.

- Managed 6 engineers, led technical reviews and OEM workshops.
- Led torque management, thermal/lubrication, and fault handling feature domains.
- Delivered Autosar Migrated software with ASPICE Compliance within 8 months.
- Generated System requirements for Torque path using Polarion and SysML.

FEV North America(Stellantis) – Auburn Hills, MI | Oct 2018 – Jan 2023

Sr. Controls Engineer / Technical Lead Engineer

- Developed torque path control algorithms including creep, dual-path shift energy management, coast-based torque split optimization, vehicle launch control and creep strategy
- Led supplier/OEM technical workshops and system requirement alignment for predictive control and tactical feature development.
- Delivered torque path logic and optimization strategies for Hybrid DCT and PHEV programs.
- Designed engine start/idle control profiling using LQR for faster actuation with minimal delays.
- Implemented e-coasting and regenerative braking interfaces with brake module for smooth torque transitions during gear shifts.
- Developed dual-path shift intervention logic across hybrid, transmission, and engine controllers.

Hybrid Design Services Inc. – Troy, MI | Dec 2016 – Oct 2018

Controls Engineer

- Developed hybrid/EV control strategies using MATLAB/Simulink & Stateflow.
- Built prototype BMS with SOC estimation via EKF, power limit calculation, and contactor control with weld check logic
- Developed CAN communication network and calibration/testing with MotoHawk controllers.
- Implemented supervisory controller to log faults via OBD-II and FTP to secure server.
- Performed a third party BMS calibration and HV battery pack testing for fuse current, isolation monitoring, contactor weld check , cell balancing etc

General Motors (Contract) – Pontiac, MI | Aug 2014 – Dec 2016

R&D Test Systems Engineer

- Built Labview based FPGA and Real time models for Rapid control prototype ECUs for test cell and Research model integration.
- Setup Matlab models for Integration with Dspace systems for prototype ECU development,validation and CAN communication.
- Performed test cell commissioning by integrating Rapid control prototype ECU with test cell environment and calibrating sensors such as MAF, Cam phaser, crank Encoders, Thermocouples, Solenoids etc.