Pranay Verma

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Senior Simulation Engineer, System Simulation, Electromobility

An automotive enthusiast working as Senior Simulation Engineer in System Simulation department, Electromobility division of Volvo Group India Private Ltd with experience of 12 years in xEV control strategy development and Model Based Development for Vehicle Functions. Looking forward for a new challenging opportunity in career.

- Core Competencies -

- MATLAB-SIMULINK
- ETAS INCA
- HILS Testing
- dSPACE Microautobox
- Vector CANoe/CANalyzer
- Python
- SQL
- xEV Modelling & Simulation
- ETAS ehooks/INTECRIO
- Optimization algorithms
- Git
- Model Based Development
- Machine Learning
- Deep Learning
- Statistics

PROFESSIONAL EXPERIENCE

System Simulation Electromobility, Group Trucks Technology, Volvo Group India Ltd

Senior Simulation Engineer (February 2023 - Present)

- **Charging and driving simulations for ESS selection for MHD/MD BEV trucks:-**

  Performed charging and driving simulations for ESS selection with different ESS configurations/ Chargers type. Estimated suitable SOC window of operation considering BOL/EOL SOH consideration

- **Power split algorithm development for three motor BEV truck:-**

  Developed a power split algorithm for three motor BEV truck as scope of improvement in control strategy**.**

- **Charging simulations for Articulated busses:-**

  Performed charging simulations for articulated busses considering different battery packs and charger specifications to develop power BI dashboard metrics for sales team.

- **Battery prognosis algorithm development (Volvo Hackathon):-**

  Lead a cross functional team of data analytics, system simulations and ESS to develop battery prognosis algorithm options which can be implemented in future projects.

- **Supervision of M.Tech thesis on Vehicle Dynamics:-**

  Supervised a team member's BITS Pilani M.Tech thesis on vehicle dynamics (Title: Integration of Volvo Traction Model in Global Simulation Platform)

- **Global Simulation Platform development and maintenance:-**

  Reviewed model updates before giving approval for model release for different cases like ESS model updates, driver model updates, charger model updates, DC/DC model updates etc.

Low Voltage System and Controls Team, R&D, Maruti Suzuki India Ltd

Deputy Manager (August 2016 – February 2023)

- **Model Based Development for Vehicle Functions:-**

  Developed Vehicle Function (Vehicle speed calculation, Charge warning lamp, Eco lamp, Oil pressure lamp, Cruise Control, Gear shift indicator, Auto detection, Speed Limiter) models from requirements and performed Model based development process (V-cycle) up to SIL level.

- **Vehicle Function development and validation:-**

  Coordinated with ECM suppliers and MSIL PICs for vehicle function software development. Validated ECM software on HILS for all vehicle functions and performed validation on vehicle for Cruise control, Vehicle Speed Calculation and Gear Shift Indication.

- **Mild hybrid function and diagnostic validation:-**

  Performed mild hybrid software specification validation on vehicle and diagnostics validation on HILS for a Maruti Suzuki mild hybrid production model.

Simulation and Controls Team, R&D, Maruti Suzuki India Ltd

Assistant Manager (August 2012 – July 2016)

- **Idle Start Stop & Alternator management control strategy simulation and validation:-**

  Developed an Idle Start Stop & Alternator management control strategy in Matlab Simulink to estimate fuel economy benefit potential and achieved benefit close to simulation by calibration on MIDC cycle.

- **Full hybrid fuel economy, emission and Gear shift optimization:-**

  Performed fuel economy, emission and gear shift optimization for full hybrid architecture using Equivalent Consumption Minimization Strategy

- **Onsite training on two battery (Pb + Li) Mild Hybrid Control Strategy development & Validation:-**

  Attended training at Suzuki Motor Corporation, Japan to understand 12V two battery mild hybrid control strategy. Supported in ISS and regenerative braking control strategy development using RCP approach. Learned about plant modelling for two battery mild hybrid system for HILS testing. Supported in Conformity of Production in Maruti Suzuki India Ltd.

- **Battery in loop test setup development:-**

  Developed a real time mild hybrid simulation model using battery in loop setup. Actual Pb battery was integrated with vehicle model developed in Simulink. Published a research paper on the work **(doi: 10.4271/2016-28-0031)**

- **Development of Real Time Control Strategy for a parallel mild hybrid vehicle:-**

  Developed real time control strategy in Simulink and validated it using dSPACE Microautobox on a prototype parallel hybrid vehicle. Published a research paper on the work. **(doi: 10.4271/2015-26-0112)**

PUBLICATIONS AND PATENTS

- Development and Implementation of an Optimal Torque Split Strategy on a Parallel Hybrid Vehicle **[SAE publication (2015-26-0112)]**
- Development of Real Time Mild Hybrid Simulation Model using Battery in Loop **[SAE publication (2016-28-0031)]**
- State of Health Prediction System for Automotive Battery **(Application No. 201911053622 A)**

CERTIFICATIONS

- Advanced Certification in Data Science and Artificial Intelligence (Indian Institute of Technology, Madras & Intellipaat)
- Complete AI and Machine Learning, Data Science Bootcamp (Udemy Certification)

EDUCATION QUALIFICATION

- **National Institute of Technology**, **Agartala**, Tripura, India

  Bachelor of Technology in Mechanical Engineering (Year of Passing: 2012) ***CGPA*** *6.86/10*