

Sunil Talwar

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Professional Profile

A dedicated Principal Control Engineer with 14 years' experience in automotive control domain. Specializes in functional safety, reducing costs and increasing efficiency. Skilled in Powertrain, Chassis and ADAS control, functional safety system design, software architecture design, requirement engineering and vehicle platforms such as PHEV, HEV, EV and Autonomous vehicle

Career Summary

January 2018 – Present

Principal FUSA Engineer, MIRA China, Shanghai, China

Key Achievements

- Designed functional safety architecture for fail operational HV battery management system and Powertrain control system which improved system availability and safety
- Invented functional safety monitoring concept and *platform* architecture of battery management system of BEV
- Designed functional safety strategies for wireless battery management system to reduce BMS failure
- Improved functional safety product quality by implementing ASPICE process assessment model

Responsibilities

- Responsible for all documentation needed to establish a safety case report, including all work products from ISO 26262 Functional Safety starting from the Concept phase through the Production and Operation phase of BMS and Powertrain control system
- Leading qualitative and quantitative analysis (FMEA, DFMEA, FTA, HAZOP) of advanced wireless BMS
- Developing functional and technical safety concept for advanced BMS and Powertrain control system
- Conducting reviews to ensure BMS System Test Plans and Specifications compliance with safety plan with respect to the verification of derived Safety concepts for BEV
- Leading efforts to derive and validate functional safety and technical safety requirements of BMS on HIL and on BEV
- Sign-off for production system safety case report

October 2015 – January 2018

Principal Control Engineer, Great Wall Motors, Baoding, China

Key Achievements

- Invented functional safety monitoring architecture for entire torque and energy path that improved system safety coverage rating and robustness level
- Designed common fault and latent fault avoidance strategies which improved safety system failure coverage
- Developed safety function/software requirements using model architecture approach for Powertrain control, Chassis and BMS systems which improved functional safety performance and control matrix
- Invented functional safety arbitration algorithm for multiple safety intervention on ACC/VLC (ADAS), torque and energy path
- Designed and developed functional safety software commissioning and pre calibration virtual test bench to reduce vehicle calibration work and test events hazards

Responsibilities

- Defined Powertrain, Chassis and BMS control system technical safety and software requirements for level 2 and level 3 layers
- Led the development of functional safety assignments (HARA, FSC, TSC, FTA and FMEA) at system and subsystem level
- Leading functional safety commissioning and pre-calibration work on vehicle for Chassis and powertrain control systems
- Ensured Powertrain, BMS and communication HSI meet functional safety requirements and safety compliance ISO26262
- Preparation of functional safety assessment and vehicle controllability report for all safety goals (ASIL B to ASIL D) of safety critical systems
- Implementation of Safety in hardware by deploying detection and mitigation of single point, latent and dependent faults.
- Leading safety system design reviews and supplier audits, assessments

February 2012 – October 2015

Team Lead, Tata Motors Limited, Pune, India

Key Achievements

- Invented parallel path control strategies for torque structure and high voltage monitoring
- Integrated ADAS and ESC safety interfaces in to torque path monitoring which enhanced system mechanism performance and diagnosis in target FTTI
- Designed modular functional safety platform architecture to support all project variants which improved system variant management and reduced system complexity
- Developed functional control safety control mechanism for HV system which improved system safety by avoiding out gassing hazard
- Earned Imagineering Leader Award for functional safety research papers

Responsibilities

- Developed function and technical safety requirements for power split hybrid powertrain program for entire torque path
- Implemented control algorithm interfacing function diagnostics and monitoring system modules for ADAS system

- Developed technical work product of functional safety assignments functional safety concept, technical safety concept and FSR,TSR of powertrain and Chassis safety systems (Brakes and Steering)
- Led the development of safety components interfaces (high voltage Inverter, DCDC, ACU) complying with ISO26262 for ASIL B, ASIL C and ASIL D
- Developed design verification methods to test safety requirements and applied them using a variety of tools including MIL, HIL, and prototypes
- Worked closely with internal, external teams and suppliers to ensure safety compliance from specifications design to production

May 2010 – January 2012

Lead Engineer, Daimler India Commercial Vehicle Ltd, Chennai, India

Key Achievements

- Designed E & E control architecture and components interface that reduced vehicle circuitry costs and quality issues
- Invented functional diagnostics strategies for electrical and electronics control system
- Reduced cost of vehicle electronics components by 12% using standardization approach
- Improved new energy vehicle fuel economy by 7% by designing an automatic clutch control and shift advisor

Responsibilities

- Designed technical product concept /architecture, platform definition, and components technical requirements
- Led delivery of all engineering deliverables for E & E components such as system specification requirements, control architecture, component sizing, FMEAs, and engineering sign-off
- Determined vehicle/powertrain system functional & diagnostic issues, validated corrective actions & preventive measures, and led testing activities to meet vehicle regulatory and safety requirements
- Owned and maintained safety related analysis across electrical and electronics hardware and software

November 2008 – May 2010

Senior Engineer, QuEST India Private Ltd, Bangalore, India (Contract)

Responsibilities

- Design and development of FADEC control system interface of aero engines in Derby, UK
- Worked on functional safety procedures and guidelines to satisfy DO-178B,MIL-STD 882 and DO-254 standards

November 2006 – November 2008

Project Engineer, Volvo India Private Ltd, Bangalore, India

Responsibilities

- Design ,development and vehicle integration of control units and components of new generation vehicles TEA2+

August 2004 – October 2006

Design Engineer, Caterpillar India Private Ltd, Chennai, India (Contract)

Responsibilities

- Design, development and vehicle integration of control units and accessories of hybrid off-highway machines
- Worked on hazard analysis and TSC implementation

Education and Qualifications

MSc

Computer Science & Controls (2016), Bhartiya Vidyapeeth University, India

Bachelor of Technology

Electrical (2004) U.P Technical University

Professional Training

MATLAB/Simulink, safety tool, CAN Tools, INCA, DOORS ,HIL and Test Vehicle, ETAS HIL test bench, CAN analyser, & ISO 26262, SysmL, ASPICE ,FTA and FMEA tools

Awards & Recognition

- Awarded with technical pioneering award at GWM for introducing new functional technology in the field of power train control and functional safety systems
- Awarded with Imagineering technology leader for introducing new technology in vehicle safety systems at TML