Abhishek Kolekar

abhishek_kolekar@outlook.com
+46-727777635
Göteborg, Sweden
/kolekar-abhishek
Transcript
Have IDP, B-level ongoing

Professional Summary

Passionate engineer with a strong interest in the automotive industry, with multifaceted knowledge in areas of vehicle dynamics and control systems. I hold a Master of Science in Mobility Engineering, focusing on testing, verification and validation (V&V), and data analysis. Through various roles during my Formula Student tenure and projects, I have developed skills and knowledge with a data-driven approach to engineering, with a focus on sustainability and performance. I am eager to bring my expertise and enthusiasm to your company, where I can grow professionally while contributing to shaping the future of mobility.

Education

Chalmers University of Technology 08/2022 – present | Göteborg, Sweden
Master of Science (MSc.) in Mobility Engineering
- Coursework: Vehicle Dynamics, Control Systems, Active Safety

PCT's A. P. Shah Institute of Technology 08/2018 – 11/2022 | Thane, India
Bachelor of Engineering (BE) in Mechanical Engineering

Professional Experience

Master's Thesis 01/2024 – 06/2024
Volvo Car Corporation
Title: Tire Warmup Relation to Rolling Resistance
- Designed an data-driven **MATLAB model** for calculating **transient rolling resistance using tire temperature** as a model input, enhancing the precision of **energy efficiency assessments** and adding insights to the tire selection process.
- **Verified and validated (V&V)** an existing Thermal-Schuring model for rolling resistance through **statistical analysis** of **experimental data**, achieving model accuracy within 5% of measured values.
- Developed **test methodologies** and **conducted on-site rolling resistance tests** on steel drum and full vehicle dynamometer rigs over 4 months; employed **INCA, MDA, and MATLAB** for comprehensive data analysis.
- Proactively identified opportunities to **improve vehicle efficiency from a rolling resistance perspective**, with modeled rolling energy loss deviating between 3% and 6% from measured values.

Automotive Engineering Project 08/2023 – 01/2024
Volvo Car Corporation
Title: Method to Improve a Wheel Suspension Design using VI-CarRealTime and optimization techniques
- **Automated vehicle simulations** in VI-CarRealTime by integrating it with a Reinforcement Learning Agent via the MATLAB API.
- Utilized **Reinforcement Learning to optimize polynomial curve coefficients of wheel motion splines**, consistently achieving specified target ranges.

Projects

Drivetrain Anomaly Troubleshooting and HIL Integration of ECU using CAN Protocol for Formula Student Vehicle 06/2023 – 08/2023
Summer Project at Chalmers REVERE
- Conducted **Hardware-in-the-Loop (HIL) testing for motor control**.
- Assisted in developing a Python script to **establish communication between the motor controller and the ECU** using the **CAN** protocol.

Virtual Vehicle Control Design & SIL Testing using IPG CarMaker 03/2023 – 05/2023
Vehicle Motion & Control - Course Project
- Designed a **normal force estimator** for model vehicle in IPG-CarMaker and implemented a **low-normal force warning function**.
- Simulated yaw-rate frequency response for model vehicle and validated with a simulation of bicycle model.

- Modeled **vehicle motion control functions** such as **cruise control and lateral acceleration control**; executed function **verification and validation (V&V)** and **performed Software-in-the-Loop (SIL) testing using IPG CarMaker**.
- Optimized suspension tuning parameters and compliances, achieving the desired handling characteristics.

Development of a Lap-Time Simulation and Energy Consumption Estimation Software for Electric Vehicles 09/2021 – 05/2022
Bachelor's Capstone Project

- Developed a Lap Time Simulation (LTS) with an energy consumption estimation feature for Electric Vehicles in order to maximise vehicle performance and optimize battery design in vehicle's pre-design phase using MATLAB.
- Parameterized a Formula Student prototype vehicle in a Quasi-Static Bicycle model, comparing and validating it against a commercially available Steady-State Point Mass Model.
- Demonstrated that the Bicycle Model, due to its complexity, yields lap times of higher accuracy.

Other Notable Relevant Projects

- Driver Behaviour Analysis & Active Safety Systems in Critical Rear-End Situations
- Microservice Development with **CI/CD** Integration
- CFD Analysis, Wind Tunnel Testing, and Shape Optimization of a Bus Model.

Positions of Responsibility

Modified Auto Club Racing - Formula Student 02/2021 – 11/2021
Team Manager

- As Team Manager, led the team to a top 10 finish in Formula Bharat Virtuals 2021, showcasing **exceptional teamwork and engineering prowess**.
- Communicated cross-functional requirements within the team, and ensured progress tracking and collaboration.
- **Prepared design critical documents** like FMEA, Design Verification & Validation Plan, Design Spec Sheet, Production Planning Gantt Chart, and Cost Report of the vehicle.

Modified Auto Club Racing - Formula Student 02/2021 – 11/2021
Powertrain Department Lead

- Led a team in designing a high-performance Formula Student vehicle's drivetrain, achieving a **0-100 km/hr theoretical time under 3.5 seconds** and a **top speed of 115 km/hr**.
- Optimized drivetrain parameters for performance and energy efficiency, as well as **durability and vibration-freeness** using **MATLAB improving efficiency by 12% from baseline spec.**
- Designed parts and assemblies of the drivetrain subsystem in **SOLIDWORKS** & **CATIA V5**, and carried out structural FEM analysis using **ANSYS Mechanical**.

Certificates

- Certified SOLIDWORKS Associate - Mechanical Design
- Certified SOLIDWORKS Associate - Additive Manufacturing
- ENGR2000X: A Hands-on Introduction to Engineering Simulations - CornellX - EdX

Skillset

Python — Expert

MATLAB/Simulink — Expert

C++ — Proficient

HIL/SIL Testing and Analysis — Proficient

CI/CD (Gitlab, Docker, Jenkins) — Competent

Languages

English — Native/Bilingual

Swedish — Conversational

Additional Information

References Available Upon Request