Abhishek Kolekar

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Transcript
Have IDP, B-type ongoing

Profile

Passionate engineer with a strong interest in the automotive industry, with multifaceted knowledge in areas of powertrain systems and vehicle dynamics. I hold a Master of Science in Mobility Engineering, focusing on vehicle dynamics, safety, and control. Through various roles during my Formula Student tenure and projects, I have developed skills and knowledge geared toward vehicle propulsion and energy storage systems, balancing performance and efficiency. Motivated and detail-oriented, I strive to build sustainable and impactful technologies. 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 – 08/2024 | Göteborg, Sweden
Master of Science (MSc.) in Mobility Engineering
Coursework: Vehicle Dynamics, Control Systems, Active Safety, Electric & Hybrid Vehicles

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

Projects

Tire Warmup Relation to Rolling Resistance 01/2024 – 06/2024
Master's Thesis with Volvo Car Corporation
- Designed an innovative **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.
- Improved upon and **verified and validated** 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 rolling resistance tests** on steel drum and dynamometer rigs over a 4-month period; 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.
- Acquired knowledge of range testing certification in accordance with the **SAE J1634** standard.

Method to Improve a Wheel Suspension Design using VI-CarRealTime and optimization techniques 08/2023 – 01/2024
Automotive Engineering Project with Volvo Car Corporation
- **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.

Driver Behaviour Analysis & Active Safety Systems in Critical Rear-End Situations 08/2023 – 12/2023
Active Safety - Course Project
- Collaborated in a team to design and evaluate an **active safety system** - Forward Collision Warning (FCW) and Automatic Emergency Braking (AEB) systems.
- Analyzed **driver behaviour from SAFER crash database** and integrated insights into the safety systems.

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** and implemented a **low-normal force warning function**.
- Modeled **AD/ADAS features** such as **cruise control and curve speed 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.

Microservice Development with CI/CD Integration 03/2023 – 04/2023
Connected Fleets - Course Project

- Formulated a **simple microservice using Docker containers**.
- Established a **CI/CD pipeline** using GitLab to automate the build, test, and deployment process for the microservice with **cross-compilation across different architectures** (linux/amd64 and linux/arm64).

Other Notable Relevant Projects

- Development of a Lap-Time Simulation and Energy Consumption Estimation for Electric Vehicles
- Development of Traction Control in Automobiles.
- 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

- **Managed and supervised a team of 32 people**, devising solutions for cohesive working and problem solving, achieving the 7th overall rank in the Formula Bharat Virtuals 2021 competition.
- **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 using **MATLAB and OptimumLap,** 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

Software Skills

MATLAB/Simulink — Expert

Microsoft Office Suite — Expert

Git — Proficient

CAN (using Kvaser CanKing) — Competent

Python — Expert

C++ — Proficient

MDA & INCA — Proficient

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

Languages

English — Native/Bilingual

Swedish — Conversational

References

References Available Upon Request