**Rushikesh Dilip Kulkarni**

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**SUMMARY**

Graduate Student specialized in HEV/EV powertrain development, Controls, Battery design. Work experience in engine performance testing, classical controls, and CAN systems. Actively seeking Full-time opportunities starting February 2021

**EDUCATION**

**M.S. in Mechanical Engineering** | GPA: 3.71 | Michigan Technological University | USA  *Dec 2020*

**B.E. in Mechanical Sandwich Engineering** | GPA: 3.5 | University of Pune | India *May 2017*

**COMPUTER AND TECHNICAL SKILLS**

MATLAB | Simulink | GT-Suite | Python | Canalyzer | CAPL | Arduino | CATIA V5 | Amesim | PTC Creo View

**PROFESSIONAL EXPERIENCE**

**Engineering Co-Op | Volvo Trucks, Greensboro, NC | Driving Environment Group** *Jan 2020 – May 2020*

* Generated 1D simulation of Truck HVAC system by using GT-Suite to predict cabin comfort for passenger by using model-based design concepts.
* Created Truck HVAC System model using Matlab-Simulink (SIL) to give generalize idea about sizing of components.
* Performed root cause analysis for the quality problem related to clogging of the heater core.
* Responsible for identifying coolant flow path in the truck and identify materials in contact with coolant by using Creo.

**Engineering Co-Op | Volvo Trucks, Greensboro, NC | Electrical Systems Design Group** *May 2019 – Dec 2019*

* Developed Model Based Simulation of weight-based engine brake system using Matlab-Simulink.
* Implemented Integrator Controller (PID) by using CAPL language (CANalyzer) for weight-based engine brakes.
* Improved engine brakes to obtain same engine braking performance even if weight of truck is different.
* Worked on Canalyzer to read and post process data obtained from CAN messages.
* Part of a group which tested new engine brake algorithm on HIL test bench.
* Derived method in CAPL (CANalyzer) to find weight of the truck by using vehicle dynamics concepts.
* Checked feasibility of Solar panel towards increasing life of auxiliary battery and fuel savings.
* Tested battery performance for hotel loads, analyzed its contribution towards battery life and fuel savings per fleet.
* Built test rig to check efficiency of solar panel according to different variables such as temperature, solar flux, etc.

**Engineering Intern | Volkswagen India, Pune, India | Engine Assembly Shop** *Jan 2016 - Dec 2016*

* Carried out Engine performance testing by using Engine Dynamometer at Volkswagen India Engine Shop.
* Checked different engine performance parameters such as torque, power, blow by gases, soot concentration, oil temperature, coolant temperature, etc. and compared it with ideal parameters.
* Solved the problem of compressor-side leakage from a turbocharger using Quality Control tools.
* Identified and solved the problem of valve stamping and oil leakage from the sump.

**ACADEMIC PROJECTS (Michigan Technological University)** *Sept 2018 – Dec 2020*

**Designed simulation model of HEV using MATLAB, Simulink and Amesim for testing**

* Designed and Sized Electric Vehicle model containing Power Electronics, Battery and PMDC system.
* Developed a driver controller subsystem to control required speed by controlling required torque using Simulink (SIL).
* Tested Miles Per Gallon equivalent of vehicle for different Federal drive cycles and analyzed trends in battery SOC.
* Performed calibration for engine On-Off control strategy which results in improvising fuel economy by 4.71%.

**Intelligent Cruise Control Design (ADAS system)**

* Developed intelligent cruise control system with velocity control & headway control modules using Simulink.
* Integrated PID controller and linear quadratic regulator for velocity and headway controller for vehicle.

**Electric Vehicle Li-ion Battery Sizing and Optimization**

* Designed and optimized vehicle battery- lasting at least 3500 cycles according to DOE FreedomCar Manual.
* Optimized battery size using Lagrangian mathematical model in MATLAB for constraints - voltage, SOC etc.
* Achieved desired battery performance parameters such as pulse power capability, maximum energy, etc.

**Fuel Economy and Computation of Aerodynamic Drag by using OBD-II**

* Collected data by using OBD WIZ for data acquisition from Chevy Volt for City and Highway Drive Cycles.
* Analyzed Vehicle fuel economy and Coast down behavior using vehicle dynamics concepts as per SAE J1263.