

SATVIK KHUNTIA

<https://www.linkedin.com/in/satvik-khuntia-3b1712106/> (380)710-4900 /khuntia.2@osu.edu/ satwik100@gmail.com

Academic Qualifications

M.S. in Mechanical Engineering	The Ohio State University (OSU)	2022	3.959/4.0
B. Tech in Mechanical Engineering with Specialization in Automotive	Delhi Technological University (DTU)	2019	8.05/10 (1 st Class with Distinction)

Experience/Projects

Fleet Connectivity Engineer Full Time PACCAR Technical Center	<i>Jan '23 – Present</i>
<ol style="list-style-type: none"> Define scope for connected trucks on DOE SuperTruckIII. Interact with other partners to integrate features such as route optimization, driver eco score. Interact with teams to integrate electric powertrain, battery pack for electric trucks. 	
Advanced Powertrain Control Engineer Summer Intern PACCAR Technical Center	<i>May '22 – Aug '22</i>
<ol style="list-style-type: none"> Worked on SuperTruckII assisting on vehicle network architecture for controller communication and electrical hardware connections. Integrated HVAC load estimator software into Simulink model for New Eagle RCM 112 controller to enable e-hoteling feature that saves \$40 per day per truck for the owner operators. Retrofitted energy management powertrain controller software into vehicle energy management controller (New Eagle GCM 196) to obtain optimal engine and electric motor torque for regeneration in hybrid electric class 8 truck to enable e-hoteling feature. Interacted with 1st tier suppliers for HVAC and powertrain requirements and control integration; and controls and electrical in house teams to understand electrical wiring connections for a proof of concept truck. 	
Predictive powertrain control for optimal hotel loads management in a 48V mild hybrid long haul heavy duty truck Graduate Research Associate Center for Automotive Research The Ohio State University	<i>Mar '21 – May '22 Aug '22 – Dec '22'</i>
<ol style="list-style-type: none"> Developed a component level physics-based model on MATLAB SIMULINK for the powertrain cooling system, HVAC system, and vehicle cabin to estimate dynamic power load. Achieved an improvement of 35% & 70% in temperature estimation model for heating and cooling phase. Developed driver behavior model with 90% accuracy for auxiliary load prediction during hoteling period using Machine Learning. Developed a powertrain cooling system model with ODEs calibrated it against test data. Studied the effects dynamic auxiliary load profile on optimal fuel consumption & battery SOC trajectories using optimal control (DP). 	
Community Conscious Smart School Bus System Graduate Research Associate Center for Automotive Research	<i>Aug '22 – Dec '22'</i>
<ol style="list-style-type: none"> Developed system level model for an electrified powertrain for energy analysis and route optimization. Performed empirical energy analysis for battery power consumption of e-bus for vehicle heat up during pre duty charging. Managed new intern to develop multi zone cabin model. 	
Impact crash worthiness analysis of Heavy Truck with CNG Gas Cylinder Cascade Rig in Indian Traffic Scenario Research Assistant Design Center Delhi Technological University	<i>July '19 – Oct '20 Jan '18 – Jul '18</i>
<ol style="list-style-type: none"> Built a CAD model of the truck on SolidWorks using survey and used ANSYS for Explicit Dynamics model. Analyzed the effect of head-on collision on the cascade rig on carrier trucks and suggest structural alterations to reduce the effect on the payload. 	
Design, Development and Analysis of a Magnetorheological Damper Major Project	<i>Aug '18 – Jun '19</i>
<ol style="list-style-type: none"> Proposed a novel design for an MR damper through 3D modeling and magnetostatics simulations on ANSYS for design optimization. Developed a cheaper alternative for industry level MR fluid at home lab. Fabricated the damper according to the new design. 	
Modeling and Simulation of Tractor-semitrailer with Split Fifth Wheel Coupling Research Intern IIT	<i>Jun '18 – Jul '18</i>
<ol style="list-style-type: none"> Modelled and completed simulations for two ISO standard tests on TruckSim in different conditions and analyzed the results for various dynamic tests on AASHTO WB-62. Developed a MATLAB script for off-tracking calculation and analysis for the different ISO standard tests. 	

Academic Projects

Powertrain Cooling System Management with Reinforcement Learning in Heavy Duty Vehicle
<ol style="list-style-type: none"> Developed optimal control algorithm using Reinforcement learning for powertrain cooling performance of a heavy duty truck. Analyzed and compared Monte Carlo and 2-step temporal differencing methods.
Engine Idle Speed control
<ol style="list-style-type: none"> Explored 3 different control strategies: PID, Integral control, LQR for vehicle idle speed controller during stops on MATLAB Simulink. Performed state estimation using Kalman Filter using MATLAB Simulink toolbox.
Passive BMS on a Li ion Battery pack (Battery Management System)
<ol style="list-style-type: none"> Built an algorithm to estimate the power limits. Implemented rule based thermal management control. Implemented charging control based on CC-CV protocol. Demonstrated passive balancing on one cell in the pack.
Modelling a Micro Gas Turbine (MGT)
<ol style="list-style-type: none"> Built a dynamic model of an MGT with a compressor, combustion chamber and turbine for distributed power generation. Simulated the system performance when connected to a power demand. Designed a feedback controller (PID) to stabilize the shaft speed.

Technical Skills

MATLAB, SIMULINK, C, C++, Java, Python, R, Ansys, Catia, Solidworks, TruckSim.