Western Engineering

Chemical & Biochemical Engineering

CBE 9982 M.Eng Research Project

Project title:	Improving thermal insulation for truck transportation (simulation)
Starting date:	January 3rd 2023
Supervisor(s):	Dr. Gleb Meirson (primary), Prof. Andrew Hrymak
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Brief description:	During the summer months the temperature inside of a truck cargo area can reach well over 50C. Hence truck insulation is an important and difficult engineering problem as it is desired to isolate the cargo from infra-red radiation effects. A company which develops heat insulation solutions has approached Fraunhofer Innovation Platform for Composites Research at Western (FIP) to design an insulation solution including best location and type. A CFD simulation is required due to the involvement of multiple heat transfer mechanisms (conductive, convective and radiation) and the complex geometry within the cargo area. The deliverable is a heat transfer simulation using CFD software allowing different insulation parameter properties and the effect of insulation location on the results. This project provides a great opportunity for problem solving skills improvement and knowledge gain through CFD simulation. No travel to FIP is required for this position.
Objectives:	- Construct a simulation in a CFD software to simulate heat transfer in a truck cargo area incorporating different heat transfer mechanisms and conditions to predict the temperature. - Examine the performance of different insulation materials using the simulation - Examine the effects of insulation positioning in different locations in the truck cargo area using the simulation.
Required knowledge:	- Knowledge of heat transfer at an undergraduate level. - Experience with a CFD software such as Fluent, COMSOL, OpenFOAM etc. is beneficial.

If interested, please contact the supervisor of the project directly for an interview.