

Master thesis at Scania and LiU: Energy consumption modeling and route planning of battery electric trucks

Background

An important part of the transition to a sustainable society is the transition to electrified transport. However, commercial transport is characterized by strict demands on punctuality and low cost. This makes it difficult to introduce electric trucks whose range depends on factors such as the weight of the load, ambient temperature, and road topography, to name just a few. These uncertainties are difficult to manage with today's transport planning methods. Managing them requires automated tools that can handle the complexity and help the drivers and transport planners to meet their demands.

Purpose of thesis

In this thesis, modeling for route planning of a battery electric vehicle is studied with the aim of making transport with battery electric trucks more reliable. The goal is to model time and energy consumption based on speed limits, ambient temperature, topography, traffic situation, etc. in such a way that given a vehicle and traffic situation the real-world time and energy consumption of driving that segment can be efficiently predicted. The area of this work is closely related to an on-going research project with Scania and LiU.

Work outline

The thesis work consists of creating models for energy consumption and range estimation, augmenting the models to account for the specific properties of battery electric trucks, adapting the models for routing purposes, and evaluating them on measurement data. It also consists of investigating effects of key factors, such as road characteristics, vehicle design, and ambient conditions on the route selection.

Qualifications

It is desirable that there are two of you, but it is fine to be alone. You are engineering students in Y, M, D, I, or similar and want to help accelerate the transition to a sustainable society. You have knowledge of vehicle modeling, drive cycles, and programming. The work can be partly done remotely.

Location

The supervision will be performed by both Scania and LiU. The student will do most of the work in Linköping, but on a regular basis travel to Scania.

Application instruction

Send your CV, cover letter and grades to
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For more information contact

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