Title: Thesis Work: Energy optimization tool for mild hybrids

Background

Starting in 2019 all of our new combustion engines will be equipped with a Kinetic Energy Recuperation System (KERS). This system includes a 48V battery pack and an electric machine, which can reduce fuel consumption by recuperating energy through regenerative braking and adding a degree of power assist to the engine. Due to the limited capacity of the battery, the efficiency of the vehicle is highly dependent on where and how the electric energy is used.

Modern navigation systems output relevant route data including speed limits and altitude, and this information can be used to predict the energy requirements and expend the electric energy where it will be most beneficial.

Scope

The objective of the thesis is to design and implement an offline optimization tool that, when given vehicle and route information, computes how the electric energy should be used in an optimal fashion to minimize fuel consumption. The problem is challenging due to the length of the considered routes, the limited capacity of the battery in mild hybrids, and thermal considerations for battery performance. Moreover, the limited computational power of the processors in a car requires a method that is not overly computationally demanding but which still provides tangible improvements. The purpose of the optimization tool is to benchmark control strategies against the theoretical optima.

Do you fit the profile?

- Applied physics, mechanical/electrical/mechatronics engineering, M.Sc., or similar
- Knowledge in optimization, optimal control and mathematical modelling
- Knowledge and experience in methods such as dynamic programming, model predictive control and convex optimization is meritorious
- Knowledge in MATLAB required. Knowledge in Java or other object-oriented programming language meritorious
- Analytical and independent
- Driver’s license (B)
**Duration**

- 20 weeks / 30 ECTS
- Starting date: December-February (Flexible)
- Estimated end date: Summer 2018
- Number of students: 1 or 2 students
- The work will be performed at dept. 94622 “Propulsive Strategy & Concept”, Volvo Car Corporation, Gothenburg

**How to learn more and to apply:**

Apply by following the link below:

Attach your resume and cover letter stating your interests within the given area and your thoughts and credentials. Please note that applications arriving later than the last application date will not be taken in consideration. Selection will be ongoing during the application period. Please note that applications via email will not be accepted.

**Contact**

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**Last application date**

2018-12-02