



Master thesis project

Enriched functional modelling software to assess automotive system architectures (30 credits)

Background

The transport manufacturing industry is transforming, bringing in electrical and autonomous technologies into both products and production processes at a faster pace than the past. At the same time, manufacturers have invested in adopting product and production platforms as means to ensure efficiency cost and quality.

The higher rate of technological introduction is challenging the flexibility of current product platforms (e.g., cars and trucks). It is critical to understand the implications the introduction of novel technologies in advance of making decisions where cost is committed. Wrong decisions about the design of product platforms will result in major changes to accommodate technologies that are not compliant with current platforms. In order to do this, new software tools to support such decisions are needed.

Thesis questions and expected outcome

The thesis will focus on the further enhancement of an existing software for functional modelling originally developed at Chalmers, Configurable Components Modeller (CCM)¹. In particular, the expected outcome is to include the possibility to import enriched Design Structure Matrix² models of product architectures back in an existing CCM model. The benefits of this development are the utilisation of historic data and DSM models that exist already in the literature (and in previous projects) within an organisation, but also to support of the creation of an architecture discovery by simulation. This means that initially identified architectures can be exported and communicated with other simulation and analysis tools and the models can be enriched with additional and more detailed information. This can then be used to discover new architectures, or refine and classify the existing architecture.

Student profile and application

Strong interest in combining programming with product development and systems engineering. Desired programming experience in C++, Java, Matlab or Python, as well as basic knowledge in object-oriented programming. Application open to any master program. Start in January or per agreement.

Contact information

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¹ <http://copesweden.se/CCM/index.html>

² https://en.wikipedia.org/wiki/Design_structure_matrix