

Master thesis.

Conversion and visual optimization of the Software Components Architecture map from XML files into UML/Simulink view

Description

Vector DaVinci Developer is a tool used in the automotive sector to design the Software Components Architecture following the AUTOSAR standards. This architecture is key for the functionality and performance of the target ECU. DaVinci Developer creates a series of XML files where the designed architecture is stored. However, DaVinci Developer does not offer the possibility to convert these files into UML or Simulink standards.

The student would need to create a tool that generates an UML/Simulink visual map of the software Components Architecture integrated with Vector DaVinci Developer. The input to the tool shall be the XML file/s from Vector DaVinci Developer.

A representative XML file will be given to the student as a reference. The visual map shall follow a defined template, which will also be provided to the student. The location in the map of the components shall be optimized to achieve a straightforward and meaningful view. Guidelines on how to organize the components into categories will be provided to the student.

This Master thesis is proposed by the company Nexteer Automotive Germany, who will support and supervise it. It is needed to work for this project in Rüsselsheim (Germany) for a period between 3 to 5 months. Travel expenses for this need will be covered by the company. Note that the thesis book shall be written in English language.

Objectives

The objective of this thesis is to create a software tool that is capable of:

- Parsing the XML file/s to extract the software components names and links between them.
- Optimizing the map location of these components based on their categories and links between them.
- Generating the output map with UML and/or Simulink format.

The software tool shall run in Windows and/or Matlab environment.

Required skills

- General programming knowledge (C, C++, Visual Basic, ...)
- Mathematical optimization
- Matlab language
- UML language
- XML language
- Fluent English (written and spoken)
- Travelling availability

Benefits/Added values

- Travel costs covered
- Monthly allowance
- Direct contact with the industrial world
- International team work experience
- Insights into the automotive electronics