



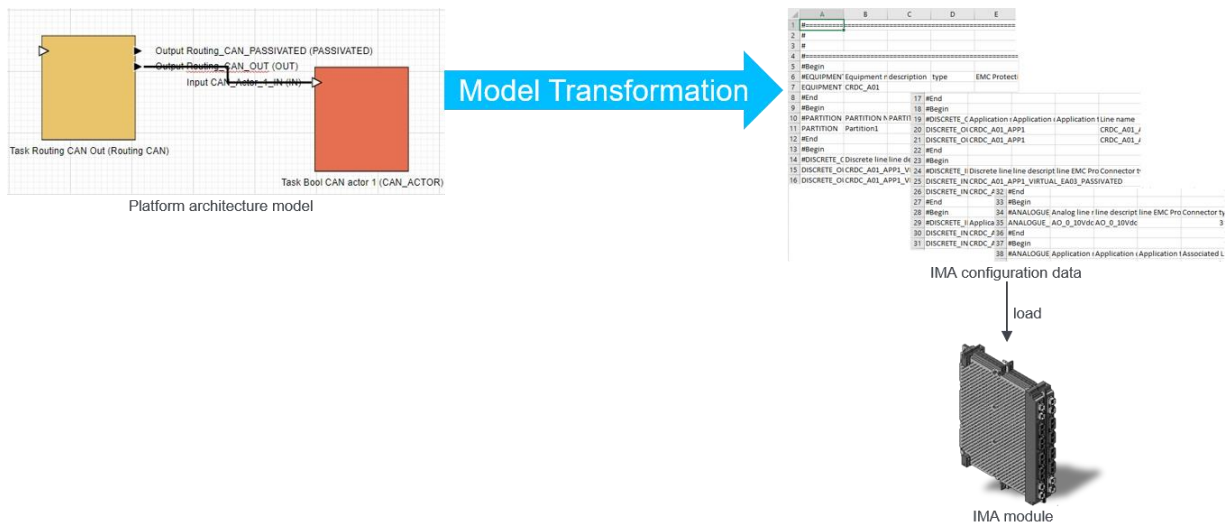
Bachelor / Master Thesis

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Development of a model transformation
for the generation of IMA configurations
from platform architecture models in
the qualifiable model transformation
language TRA

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The use of model transformations in the development of Integrated Modular Avionics (IMA) configurations enables a more efficient development process through automation. IMA architectures are modeled in a domain-specific language. Model transformations generate IMA configurations from the platform architecture models. These IMA configurations are loaded onto IMA hardware modules.

In the TALIA project, a domain-specific modeling framework DOMAINES was developed for use in a safety-critical development process. DOMAINES consists of a qualifiable model transformation language TRA. TRA should be able to generate IMA configurations from platform architecture models. The transformation rules have to be specified in the model transformation language MetaTRA. TRA must implement the transformation rules in code and execute them on platform architecture models.

Task

The goal of this thesis is the development of a graph-based model transformation for the generation of IMA configuration models from Open Avionics Architecture Models (OAAM) in the model transformation language TRA. A domain-specific language for configuration models must be defined. Transformation rules for the generation of IMA configurations from platform architecture models must be developed. The transformation rules must be implemented in qualifiable model transformation code (TRA executor). Finally, the model transformation should be executed on architecture models for demonstration.



Work items:

- 1) Familiarization
 - a. Graph-based model transformations
 - b. IMA configuration
 - c. Model transformation language TRA
 - d. Configuration generation in the Platform Configuration Tool (PlaCoTo)
- 2) Development of model transformation
 - a. Development of configuration model language and configuration models
 - b. Development of graph-based model transformation in TRA
- 3) Implementation of model transformation in qualifiable code (TRA Executor)
- 4) Demonstration of the model transformation on platform architecture models
- 5) Documentation of the results
- 6) Final presentation

Begin: May 2025

End:

Supervisor 1: Constantin Frey

Examiner 1: Prof. Björn Annighöfer

Date, signature student: _____

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