Graduation Project proposal

Company:

Supervisor(s) at company (name + e-mail addresses):
Ramon Schiffelers (ramon.schiffelers@asml.com)

University

Supervisor(s) at university (name + e-mail addresses; TU/e will look for suitable supervisors if left blank):
Bram van der Sanden (b.v.d.sanden@tue.nl)

Project title (or topic):
Controller synthesis for modular software design

Short project description:
The goal of this Master Project is to study synthesis of controllers for an architecture with controllers and interfaces as utilized by ASML, the world-leading provider of lithography equipment. The models will be created in CIF3, using a clear separation between the modeling of system capabilities and requirements. The controllers that are currently modeled within ASML will also be translated to CIF3. Using CIF3, a comparison will be made between the manually designed controllers and the synthesized controllers, to verify whether the behavior is equivalent. After comparison, the synthesized controllers are translated to the ASML environment potentially allowing integration into the software system.

Technical assignment:
This assignment contains the following steps:
1. Getting acquainted with the problem domain.
2. Extracting the requirements of components that are now manually integrated in the controller design.
3. Creating formal models of the requirements and the low-level system interface in CIF3.
4. Using synthesis to automatically obtain a controller.
5. Translating the current controller designs into CIF3 models.
6. Comparing the two controllers to verify whether they exhibit the same behavior.
7. Translating the CIF3 models back to ASML controllers, so that the generated controllers can in principle be integrated into the existing architecture.
8. Reporting approach and findings in a Master thesis or graduation paper and a public presentation.

Business assignment*:

*This part is only relevant for graduation projects carried out by students of the EIT ICT Labs (www.ictlabs.eu) variant of the Embedded Systems program. In addition to the MSc thesis about the technical aspects of their graduation project, these students need to write a short additional report discussing the business-related aspects of their graduation project. Please fill in this part if you wish your project proposal to be considered for this option.