

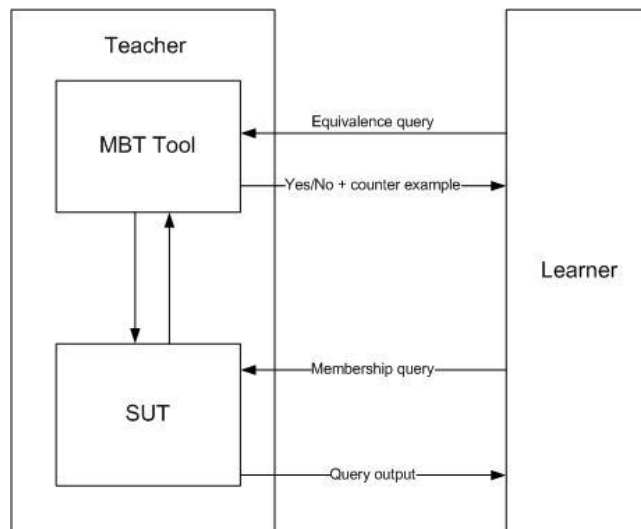
Model-Based Testing and Model Learning of Embedded Systems

A printer consists of several modules, e.g. paper input, paper transport and finishing modules. These modules are steered by complex embedded software developed in C/C++ with Rational Rose RealTime.

Currently this software is tested via manually written test cases.

The assignment is to automate regression testing for one of the modules to assure that small changes in the software do not cause regression, i.e., the introduction of new failures, in the software. Therefore model learning techniques shall be used to automatically generate a model from the old system, which can then be used for model-based regression testing of the modified system.

This assignment is done within the context of the ITALIA project (Integrating Testing and Learning of Interface Automata www.italia.cs.ru.nl), and is a follow-up of the assignment of Wouter Smeenk (Applying Automata Learning to Complex Industrial Software).



Challenges of this assignment are:

- Model learning will be done with the tool LearnLib (<http://ls5-www.cs.tu-dortmund.de/projects/learnlib>); for model-based testing a suitable tool must be selected, and probably adjusted to the Océ context;
- Development of an interface adapter between LearnLib/MBT tool and the SUT (System Under Test, i.e., the Océ embedded software; this software has a clear interface);
- Use of model learning and model-based testing together with SIL (Software In the Loop simulation, which is used to simulate the hardware such as paper feeder and paper transport);
- How to integrate timing requirements and parameters in learning and model-based testing;
- How to handle non-deterministic behavior of the SUT in learning and model-based testing.

Do you recognize yourself in the next description?

You are currently studying computing science on master level. You think it's a challenge to work in a multidisciplinary environment and like your assignment to contribute to the software development within the organization.

Are you interested in this assignment?

If you want to know more about the assignment you can contact Reinier Dankers (+31(0)77 359 3754, reinier.dankers@oce.com) or Harald Schwindt (+31 (0)77 359 3016, harald.schwindt@oce.com) or Jan Tretmans (jan.tretmans@esi.nl, tretmans@cs.ru.nl).

Would you like to apply directly? Please click on the button above and fill in all your personal details!

Embedded Systems Institute

Located in Eindhoven, the Embedded Systems Institute (ESI) is a leading research institute that focuses on embedded systems technology. It distinguishes itself through its open innovation approach, with strong connections with academia and industry and a strong focus on research valorization. The mission of ESI is 'to advance industrial innovation and academic excellence in embedded system engineering.' For more information, please visit www.esi.nl.

Radboud University Nijmegen

The Model Based System Development group (MBSD) at the Radboud University Nijmegen performs research and teaching on the use of models in software development, with emphasis on model checking, model analysis, model-based testing, and model learning. The MBSD group coordinates the STW project ITALIA.

Océ Technologies

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