Thesis Title: Guided Test Execution through Analysis of Test Case Dependencies

Description: Considering the limitation of resources that are allocated for testing activities, e.g., with respect to time and budget, selection of which test cases to execute and their execution order can play an important role in identification of more severe problems in a software product. Various test case characteristics including dependencies that can exist between test cases can help and provide useful information in making optimal decisions on selection and ordering of test cases for execution. The main goal with this thesis is to implement and apply various techniques in order to identify an optimal order for execution of test cases through analysis of their dependencies. The thesis consists of a research part on how an optimal order can be decided from dependency relationships and an implementation part in which a tool is implemented for visualization and analysis of dependencies. The expected outcomes of the thesis are therefore as follows:

- A method for inference and identification of test case dependencies
- A tool for visualization and analysis of dependencies
- Development of the analysis algorithms
- Producing an ordered set of test cases for execution based on the above analysis

This thesis work is defined in the scope of the MegaM@RT (Mega Modelling at Runtime) project (www.sics.se/projects/megamart). MegaM@RT will create a framework incorporating methods and tools for continuous development and validation leveraging the advantages in scalable model-based methods to provide benefits in significantly improved productivity, quality and predictability of large and complex industrial systems.

Competence: Programming experience in Java or C particularly development of GUIs. Familiarity with software testing and Python is a plus. Good spoken and written English skills are required.

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Misc: The thesis can also be taken as a joint-work by 2 students.

Application: To apply please send your CV along with the list of courses you have taken and their grades to sahart@sics.se. In your CV provide a short description of previous projects that you have done.

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