

Referenz: TAMES-Prototype

Thema: Prototype for Test Automation for Modular (Embedded) Systems (TAMES)

LVA-Typ: Seminar, Praktikum, Bakk-/Masterarbeit

Start: As soon as possible

Ende: To be defined

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Background

In software-intensive systems, such as complex component-based applications or robots in a manufacturing cell, the flexibility and configurability of systems and related components are critical aspects to enable efficient engineering, operation, and maintenance processes. A test automation system includes a set of architecture levels from business applications (test management) to software components and hardware layers that enable physical operations on hardware components, such as individual software components, robots, or data received from sensors.

Main goal of a system reconfiguration is reducing the risk of system downtime during operation. For example, downtime for exchanging a software component or a hardware sensor should require a minimum time. Thus, a main challenge is to test exchanged components beforehand, i.e., prior to physically exchanging the component.

Figure 1 presents a seven-layer testing framework for software-intensive systems, providing method and tool support for *Test Automation for Modular (Embedded) Systems* (TAMES). For every layer, a set of tools and methods is available as foundation for a test automation tool chain.

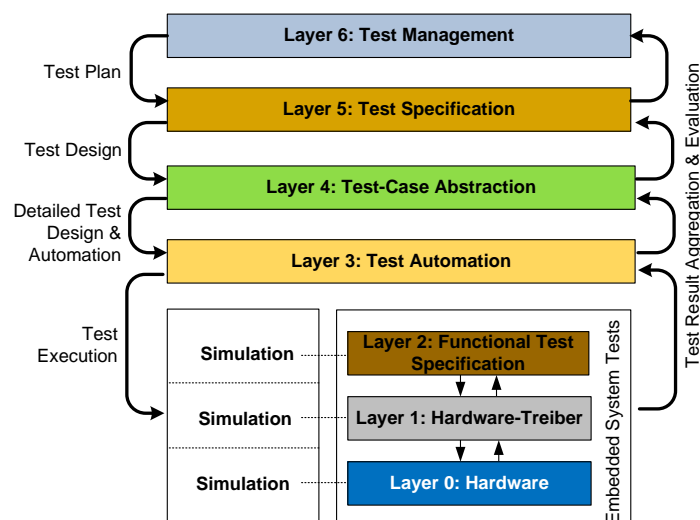


Figure 1. Schematic Level Concept of the TAMES Framework.

The overall goals of this project include (a) the identification and evaluation of individual tools suitable on individual layers, (b) the definition of interfaces to support the interaction between two or more tools, and (c) the prototype implementation of selected tool chains.

This specific topic focuses on prototyping a tool chain for selected tools (including at least two layers of the testing framework) to support related areas such as test management, test case / test data design and generation, automated test execution, and reporting. Note that research and industry partners will support these topics.

Tasks:

- Concept for a tool chain towards a comprehensive test automation approach (for a subset of the layers).
- Concept of interfaces to enable the efficient and effective data exchange and transfer between different layers (towards a full test-automation architecture stack).
- Prototype implementation of selected tool chains segments based on real-world scenarios and with simulated/real-world hardware applications.

Expertise:

For this topic a set of skills is recommended (at least two are mandatory).

- Java and the standard technology stack (e.g., Maven, issue tracker, SCM).
- Quality assurance methodologies, such as test automation.
- Testing concept knowledge on selected testing levels (according to Figure 1).
- Tool knowledge related to individual testing levels.
- Interest in Quality assurance / tooling and tool development.
- Experience in team work in distributed (software) engineering projects.