

**Referenz: TAMES-Tool**

**Thema: Tool Study for Test Automation for Modular (Embedded) Systems (TAMES)**

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

Start: As soon as possible

Ende: To be defined

Kontakt: Dietmar Winkler (dietmar.winkler@tuwien.ac.at)  
 Stefan Biffel (stefan.biffel@tuwien.ac.at)

### 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.

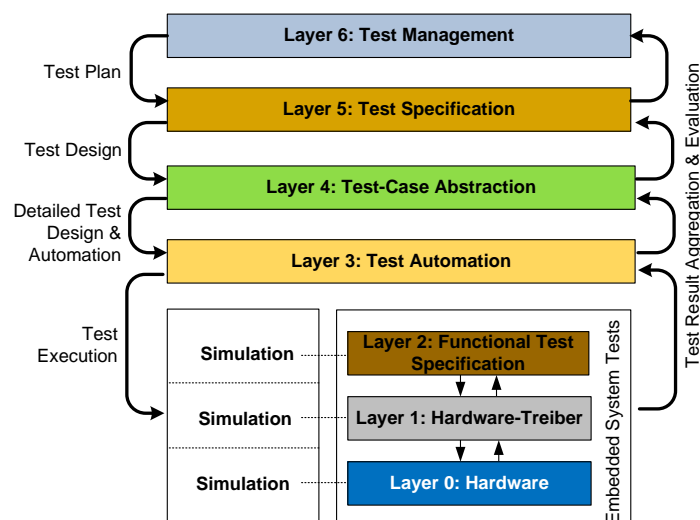


Figure 1. Schematic Level Concept of the TAMES Framework.

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 investigating tool support (i.e. a tool study) for modular (embedded) systems on different layers for test automation. Note that research and industry partners will support this topic.

**Tasks:**

- Requirements elicitation for each layer of the test automation framework (see Figure 1) with focus on automating the test process. Specific requirements should also consider integration capabilities for linking tools across layers.
- Survey of available tools assigned to a specific testing layer.
- Definition of evaluation scenarios to analyse identified candidate tools.
- Design of a tool study to efficiently evaluate selected tools based on requirements and scenarios and execution of the tool study.

**Expertise:**

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

- 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.