

# Informatik-Kolloquium

Der Fachbereich Informatik der Johannes Kepler Universität Linz<sup>1</sup> lädt in Zusammenarbeit mit der Österreichischen Gesellschaft für Informatik (ÖGI) zu folgendem Vortrag ein:

**Cyrille Artho**  
Senior Researcher at AIST, Japan  
und  
**Takashi Kitamura**  
Post-doctorial research scientist at AIST, Japan

Titel:  
**Modbat: A Model-based API Tester for Event-driven  
Systems  
und  
Test-Case Design by Feature Trees**

10.09.2013, 10:00 Uhr  
Johannes Kepler Universität Linz, Raum SP3 218

## **Abstract 1:**

Model-based testing derives test executions from an abstract model that describes the system behavior. However, existing approaches are not tailored to event-driven or input/output-driven systems. In particular, there is a need to support non-blocking I/O operations, or operations throwing exceptions when communication is disrupted.

Our new tool "Modbat" is specialized for testing systems where these issues are common. Modbat uses extended finite-state machines to model system behavior. Unlike most existing tools, Modbat offers a domain-specific language that supports state machines and exceptions as first-class constructs. Our model notation also handles non-determinism in the system under test, and supports alternative continuations of test cases depending on the outcome of non-deterministic operations.

<sup>1</sup> Der Fachbereich (<http://informatik.jku.at>) besteht aus folgenden Instituten: Anwendungsorientierte Wissensverarbeitung (FAW), Bioinformatik, Computational Perception, Computer-Architektur, Computergrafik, Formale Modelle und Verifikation, Informationsverarbeitung und Mikroprozessortechnik (FIM), Integrierte Schaltungen, Pervasive Computing, Systems Engineering and Automation, Systemsoftware, Telekooperation

These features allow us to model a number of interesting libraries succinctly. Our experiments show the flexibility of Modbat and how language support for model features benefits their correct use.

### **Abstract 2:**

We propose a test-case design method for black-box testing, called "Feature Oriented Testing (FOT)". The method is realized by applying Feature Models (FMs) developed in software product line engineering to test-case designs. We develop a graphical language for test-case design called "Feature Trees for Testing (FTT)" based on FMs. To firmly underpin the method, we provide a formal semantics of FTT, by means of test-cases derived from test-case designs modeled with FTT. Based on the semantics we develop an automated test-suite generation and correctness checking of test-case designs using SAT, as computer-aided analysis techniques of the method. Feasibility of the method is demonstrated from several viewpoints including its implementation, complexity analysis, experiments, a case study, and an assistant tool.

### **About the Speakers:**

**Cyrille Artho** obtained his Ph.D. at ETH Zurich, Switzerland, in 2005. After his Ph.D., he moved to NII, Tokyo, Japan, to continue his research, and is now a Senior Researcher at AIST, where he has been working since 2007.

Cyrille Artho's main interests are software verification and software engineering. In his master's thesis, he compared different approaches for finding faults in multi-threaded programs. Later in his Ph.D. thesis, he continued his search for such errors, while also looking at test case generation. His most recent work focuses on analyzing networked systems.

**Takashi Kitamura** obtained his ph.D. from the Chinese Academy of Sciences, Beijing, in 2008. Since then, he has been working at AIST, Amagasaki, Japan, as a post-doctoral researcher and later as research scientist.

His interests include the formal analysis of requirements and formal, model-based approaches to testing. His most recent work focuses on combinatorial approaches to test case generation.

*Prof. Dr. Armin Biere*

*Institut für Formale Modelle und Verifikation*

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