Aspect-Oriented Linearizability Proofs

Ali Sezgin
IST Austria

Where: Jakob-Haringer-Str. 2, Room T02

When: Thursday, June 20, 2013, 17:00 Uhr c.t.

Linearizability of concurrent data structures is usually proved by monolithic simulation arguments relying on identifying the so-called linearization points. Regrettably, such proofs, whether manual or automatic, are often complicated and scale poorly to advanced non-blocking concurrency patterns, such as helping and optimistic updates.
In response, we propose a more modular way of checking linearizability of concurrent queue algorithms that does not involve identifying linearization points. We reduce the task of proving linearizability with respect to the queue specification to establishing four basic properties, each of which can be proved independently by much simpler arguments. As a demonstration of our approach, we verify the Herlihy and Wing queue, an algorithm that is challenging to verify by a simulation proof.
This is joint work with Thomas A. Henzinger (IST Austria) and Viktor Vafeiadis (MPI-SWS).

Ali Sezgin obtained his PhD from the University of Utah in 2004. He is currently a post-doctoral researcher with Thomas A. Henzinger at IST Austria.

UNIVERSITÄT SALZBURG

embedded Software & Systems Center
Colloqium Series