

First Prometidos Summer School

Madrid, 19-21 September

PROMETIDOS-CM (*Madrid Program in Rigorous Methods for the Development of Software*) is a R+D program funded by the regional government of Madrid, Spain, that involves some leading research groups in Computer Science in the region (IMDEA-Software, CLIP-UPM, BABEL-UPM, FADOSS-UCM, GPD-UCM). The scientific interests of PROMETIDOS-CM cover all aspects of development of software based on modular, scalable and realistic rigorous methods.

One of the strategic purposes of PROMETIDOS-CM is the realization of effective training actions to introduce young post-graduate and PhD students in the research area of rigorous methods. The announced Summer School attempts to be a contribution in this sense.

Lars-Åke Fredlund - Clara Benac Earle Erlang and the McErlang model checker

Developing reliable concurrent software is a hard task given the inherent non-deterministic nature of concurrent systems. A technique which is often used to check that a concurrent program fulfils a set of desirable properties is model checking. In model checking, all the states of a concurrent system are systematically explored. We have developed McErlang, a model checker for Erlang. The Erlang program to be analyzed is run under the McErlang run-time system, under the control of a verification algorithm, by the normal Erlang byte-code interpreter. The pure computation part of the code, i.e. code with no side effects, including garbage collection, is executed by the normal Erlang run-time system. However, the side effect part is executed under the McErlang run-time system which is a complete rewrite in Erlang of the basic process creating, scheduling, communication and fault-handling machinery of Erlang. Naturally the new run-time system offers easy check pointing (capturing the state of all nodes and processes, of the message mailboxes of all processes, and all messages in transit between processes) of the whole program state as a feature. McErlang has been used to verify critical parts of a number of Erlang applications.

Lars-Åke Fredlund first learned of Erlang when attending a course on "Declarative Real-Time Programming" at the Royal Institute of Technology in Stockholm, Sweden, in 1991. Working at the Swedish Institute of Computer Science (SICS), the relationship with Erlang continued; one outcome was a formal semantics for Erlang (part of his PhD thesis in 2001). Lured to Madrid in 2005, Lars-Åke found more free time to work with Erlang resulting in a number of articles concerning the "real" communication guarantees of Erlang (more tricky than you think...) and a new tool to verify concurrent Erlang software: McErlang. He also tries, mostly in vain, to convince his office mates and students at the Technical University of Madrid that Erlang has a much better process model than ADA.

Clara Benac Earle currently works at the Universidad Politécnica de Madrid where she lectures and works as a post-doc researcher in the EU FP7 ProTest Project. She first learnt of Erlang when working at the Ericsson CSLab in Stockholm, Sweden, in 1999. Her main research interest lies in the formal verification of concurrent programs, in particular applied to the Erlang programming language. She holds a PhD from the University of Kent, UK, since 2005.
