Institut für Softwaretechnik
und Interaktive Systeme

The Women's Postgraduate College for Internet Technologies (WIT), the Faculty of Informatics of the Vienna University of Technology and the Austrian Computer Society (OCG) invite to:

WIT-Kolloquium

A Grand Challenge: Full Reactive Modeling of a Multi-Cellular Animal

David Harel
The Weizmann Institute of Science, Israel

When: Monday, December 12, 2005
               17:00 - 18:00 +

Where: Vienna University of Technology
               Zemanek Hörsaal
               Favoritenstr. 9-11, 1040 Wien
               Ground floor

Abstract
Biological systems exhibit the characteristics of reactive systems remarkably, and on many levels; from the molecular, via the cellular, and all the way up to organs, full organisms, and even entire populations. Thus, a different brand of bioinformatics arises, in which, rather than "we" solving "their" computational problems, we use "our" languages, methods and tools to model and analyze "their" complex systems. This talk proposes a grand challenge for computer scientists and biologists: to model a full multi-cellular animal as a reactive system. We would like to construct a full, true-to-all-known-facts 4-dimensional model, that would be animated, flexible and comprehensive, and would enable full and realistic simulation of the animal's development and behavior over time (the fourth dimension). The talk will argue the (long-term) feasibility of the challenge, by describing two pieces of preliminary modeling work: (i) T-cell behavior in the thymus, using statecharts with Rhapsody, linked with Flash animation, and (ii) parts of the vulval development of C. elegans, using LSCs with the Play-Engine.

Bio
David Harel has been at the Weizmann Institute of Science since 1980. He was Department Head from 1989 to 1995, and was Dean of the Faculty of Mathematics and Computer Science between 1998 and 2004. He is also co-founder of I-Logix, Inc. He received his PhD from MIT in 1978, and has spent time at IBM Yorktown Heights, and at Carnegie-Mellon and Cornell Universities.
In the past he worked mainly in theoretical computer science, and now he works in software and systems engineering, modeling biological systems, and the synthesis and communication of smell. He is the inventor of statecharts and co-inventor of live sequence charts, and co-designed Statemate, Rhapsody and the Play-Engine. He received the ACM Outstanding Educator Award (1992), the Israel Prize (2004), an honorary doctorate from the University of Rennes (2005), and is a Fellow of the ACM and of the IEEE. More info: http://www.wisdom.weizmann.ac.il

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Funding

Note
Attendance free!
After the talk there is the opportunity for an informal exchange of opinions at the buffet.