

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.

Julio Mariño

Modeling and verification of concurrent systems using shared resources

“Shared resources” is a high-level, language independent model for concurrent programming based on a sharp distinction between active (threads, processes) and passive (interactions) entities. It is supported by a formal notation and companion methodology which, together, constitute a usable approach to the model driven development of concurrent applications. Shared resources have been used at UPM for teaching concurrency at the undergraduate level for the last 15 years. Originally conceived as a gentle extension of a formal notation for teaching abstract data types -- just adding the extra synchronization component -- they have recently proved useful out of the classroom to model and analyze complex, real world systems. From the point of view of software design, shared resources fill a gap in widely used modeling notations regarding concurrency. At the code level, they have been used for semi-automatic generation of correct-by-construction code. Finally, wrt. analysis and validation, they can be seen as automata generators.

The talk will give an overview of the formalism and methodology from the different points of view mentioned above. Then, a representative suite of examples of increasing complexity will be presented in order to demonstrate the expressiveness of the model. Finally, we will show the application of the formalism to requirements validation and code certification with the help of various analysis tools.

Julio Mariño is an associate professor at Universidad Politécnica de Madrid where he currently leads the Babel research group, devoted to the application of declarative technology to the development of reliable software. Most of his research deals with logic and constraint programming and the integration of the functional and logic paradigms. He has lectured on nonclassical logics, type systems, object-oriented analysis and design, and is currently responsible for teaching concurrency at undergraduate level and formal methods at graduate level at the School of Computer Science at UPM.
