Abstract

The goal of this workshop is to discuss different facets of computer-based modelling tools and processes supported by these tools. This includes discussion of various types of modeling, representations of models, the role of visualizations and of executable models as well as intelligent support for the modeling process, reporting and documenting the process in single user environments and in collaborative, co-constructive environments.

1. Theme

The importance of modelling as a cognitive activity was propagated in recent years [7] and resulted in reinforced research and the development of a multitude of computer-based modelling environments, such as Belvedere [8], Co-Lab [1], Cool Modes [6], Modelling Space [5], and WISE [4] to name a few. The use of models for learning can be roughly distinguished between “learning with models”, e.g. in the student using a predefined model for experimentation purposes (these models are mostly executable to facilitate experimentation), and “learning by modelling”, i.e. the process of creating the model (maybe even in different representations or at different abstraction levels) is the main task of the student in gaining the insight in the phenomenon or the system to be modelled.

A special area of research within modelling is collaborative modelling, which has its roots in socio-constructivist approaches, where knowledge is claimed to be socially constructed facilitated by interactions between learners. Especially the collaborative construction of models is a process well suited for these learning theories. The support of collaborative modelling by special modelling tools for discovery learning [3] lead to a fusion of the two concepts of “collaborative modelling tools” and “mind tools / objects to think with” [2] which resulted in the notion “collaborative mind tools”.

2. Expected Outcomes

The goal of this workshop is to discuss these different facets of computer-based modelling tools and processes supported by these tools.

Main topics of interest for discussion include but are not limited to:

- various types of modeling (inquiry modeling, glass-box modeling)
- (multiple) representations of models
- the role of visualizations for modeling
- the role of executable models
- intelligent support for the modeling process
- intelligent support for reporting and documenting the modeling process
- collaborative and co-constructive modelling tasks
- monitoring and visualization of collaboration in modelling tools
- design principles for modelling environments

3. Committee and Organization

Members of the Committee

- Nikolaos Avouris, University of Patras
- Angelique Dimitracopoulou, University of the Aegean
- Andreas Harrer, University Duisburg-Essen
- Ulrich Hoppe, University Duisburg-Essen
- Wouter van Jooleing, University Amsterdam
- Marcelo Milrad, University of Växjö

The workshop will have a duration of 2 ½ hours and will be a combination of short position statements (5-10 mins, reflecting results of research, principles of
implemented tools, and comparison of different approaches), software demos, and a general discussion mediated by the committee.

List of Position Papers:
- Visualization of Synchronous Collaborative Modeling Activities, Margaritis/Avouris/Komis
- MODELLINGSPACE: Supporting Young Students to be Thoroughly Involved in Modelling & Collaborative Modelling Activities, Dimitracopoulou/Komis
- Learning with Models and Learning by Modelling: Exploring the Role of Multiple Representations Using Computational Media, Milrad
- An Integrated Approach for Analysis-Based Report Generation, Bollen/Harrer/Hoppe
- Roles of Modeling in Inquiry Learning, van Joolingen

4. References

[1] CoLab – Collaborative Laboratories for Europe, website www.co-lab.nl