



Bachelor-, Master- und Doktorandenseminar  
des Instituts für Informatik

## Modular Modelling Support for Multi-Agent Based Simulation

Tobias Ahlbrecht, B.Sc., TU Clausthal

Multi-agent based simulation (MABS) is an emerging field in the ever-growing simulation landscape. As its focus lies on individually behaving actors and how they change the system, it is a suitable approach whenever the system to be simulated comprises a number of entities exhibiting complex behaviour, which is to be modelled and studied explicitly, resulting in a kind of micro perspective.

While offering many advantages, describing each actor and its individual behaviour means more work for simulation developers. To support them in their tasks, a variety of simulation tools and platforms, modelling methodologies and metamodels with accompanying models have been devised, mostly in the last 10 to 15 years. An inherent problem here is that most of these tools are bound to a certain application or niche, e.g. some tools might only support certain kinds of traffic simulation, while others are tailored to a particular methodology.

Those examples are highly specialized in their field and might even perform very well, however, only very rarely are they providing features like compatibility, reusability and even interoperability of simulation models to facilitate model creation and comparison.

Going in this direction, simulation modelling would need a common starting point, that guarantees simple integration of arbitrary models and a shared point of view when comparing models while being non-restrictive in what can be modelled and how it is to be done.

Thus, the aim of this work lies in analysing existing modelling frameworks for multi-agent systems and multi-agent based simulation and - building on that - the development and evaluation of a general base framework, consisting of

- (i) a modular metamodel,
- (ii) a common exchange format for metamodels, models and other necessary artefacts, and
- (iii) elementary tool support for each part of the modelling process, including code generation to derive concrete simulations.

Dienstag, den 12.07.2016, 9 Uhr s.t. im  
Seminarraum 210, Ifl, Am Regenbogen 15