

## EINLADUNG

**Zeit:** Donnerstag, 11. März, 10.30 Uhr

**Ort:** German Research School for Simulation Sciences,  
Schinkelstraße 2a, Seminarraum 102 (1. Etage)

**Referent:** Prof. Dr. Emilio Luque, Universitat Autònoma de Barcelona

**Titel:** Agent-Based (Individual-Oriented) Models: Simulating Fish School  
and Hospital Emergency Departments

### Abstract:

Computational simulation has been used as a powerful tool to represent the dynamical behaviour of systems based on complex models. In Individual-oriented (IoM)/Agent Based (ABM) Models, the unit of the system is the individual, so the group's heterogeneity can be represented through the differentiated behaviour of each individual. Therefore, "individuals are the building blocks of ecological system. The properties and behaviour of individuals determine the properties of the systems they compose". This means the ABM/IoM modeller defines the behaviour at the agent level and the global, or system, behaviour emerges as a result of the interactions of the many individual agents. Agent Based/Individual-oriented Modelling has its main roots in modelling individual decision making, human social interactions, and the organisational behaviour of biological systems. The development of the Fish School simulator includes the possibility of working with large models that include large numbers of fish (> 10M of individuals), predators and obstacles in the simulated world. In addition to the classical numerical model for the Fish School simulation, we have also implemented a "fuzzy model" for this simulation. Experiments performed demonstrated that our model represents the real behaviour of Fish School. Hospital emergency departments are complex systems, characterised by uncertainty and variability, often operating with limited resources and high demands. Simulations of these departments have proven to be efficient tools in improving their performance in certain circumstances, however the human aspect is often overlooked in the application of modelling and simulation to this field. One of our projects is applying agent-based modelling techniques to the simulation of hospital emergency departments. The work performed included system analysis and a preliminary model, showing the advantages of this technique.

Es laden ein: Die Dozenten der Informatik