

Hands-On Workshop on Individual/Agent-Based-Modelling

An initiative of IUFRO group 4.01.06 – “Quantitative Ecology” in collaboration with the Graduate School in Applied Statistics & Scientific Computing at the Swedish University of Agricultural Sciences

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Agent/Individual-based modelling (ABM, IBM) techniques have emerged as crucial tools for analysing and understanding self-organisation processes in various ecosystems as well as in social sciences. ABM/IBM is a methodology for relating the micro-level behaviour to the macro- or system-level behaviour and shares certain similarities with game theory. In combination with new methods of spatial statistics ABM/IBM have become an intriguing method for studying spatio-temporal patterns among other things.

An important part of individual-based models are interaction processes between individuals or agents, e.g. trees, humans or animals. For describing and modelling interaction, IBM modellers mostly use kernel functions. This concept has its origin in various fields of natural sciences such as in the ecological field theory and in shot-noise fields of physics. These interaction functions describe how biological processes such as growth, survival and reproduction of an individual depend on its own size and the size of and distance to other individuals. In the workshop, we will also consider and discuss birth- and death processes including the way how they are related with interaction.

A two-days practical workshop will be held at Umeå where beginners and more advanced modellers in the realm of agent/individual-based modelling mix and meet. The objective of the workshop is to share knowledge, experience and tips and tricks in this important field of modelling and to advance our understanding of how to apply this concept to various fields of ecology. Following 1-3 keynote presentations the participants present their work or state their interest. During these presentations burning issues and problems are identified, discussed and possible solutions exchanged, e.g. the statistical estimation of model parameters, programming issues and model functions. In this workshop, groups with similar interest work on possible solutions to their problems and the results are presented in a final plenary session. Participants are encouraged to bring draft manuscripts or sketches of initial ideas for papers. Ideally – as a long-term outcome of the workshop – several papers are published on this topic by the participants.

Fee: We feel committed to run this workshop at low costs. Therefore we raise only €50 per person to cover the costs of food including a workshop dinner.

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