Social Science Microsimulation

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With 128 Figures
and 20 Tables

Springer

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Preface

In the social sciences microsimulation is the simulation of dynamic feedback (in both directions) between individual states and states of the population as a whole or certain groups within a population. It should also include dynamic feedback between the individuals and the emergence of new phenomena on the group or population level. Social science microsimulation in this sense is a task which still suffers from a number of deficiencies:

If a model is straightforwardly described in a high level simulation language (like DYNAMO in the Systems Dynamics Tradition, or MIMOSE in the younger, concept based microsimulation approaches), then large scale models with a great number of interacting individuals cannot be run efficiently (in the case of MIMOSE and also in SmallTalk based multi agent models) or are impossible or extremely difficult (DYNAMO).

If a model can be run efficiently with a large number of individuals, then it must have been written down in a general purpose language and is only difficult to communicate in its details, as is the case with most data driven microsimulation models (as, e.g. the models of Sonderforschungsbereich 3 or the Darmstadt Micro Macro Simulator).

There are at least two different traditions (of course, very short traditions) of social science microsimulation: (1) data based dynamical microsimulation with no or little interaction between the individuals, and the individuals regarded as black boxes behaving stochastically, and (2) concept driven microsimulation based on the distributed artificial intelligence approach, with the individuals modeled as agents with memory, goals, and rules, and acting in an environment. Both approaches have evolved in almost total ignorance of each other and a synthesis might be valuable.

Social science modellers need to be able to describe their models in a problem oriented language which other social scientists can understand (for example, MIMOSE); define models using a comprehensible computer-user interface; and run models efficiently. This book discusses the solutions which computer scientists have found or are developing for these problems.

First drafts of the contributions to this volume were presented at an inter-

national seminar held at the Internationale Begegnungs- und Forschungszentrum für Informatik at Schloß Dagstuhl in May 1995. Participants included economists and social scientists applying microsimulation techniques of various different kinds as well as computer scientists interested in helping the former to solve their problems more elegantly and efficiently. Thus representatives of at least three different scientific communities gathered in order to discuss their problems and to help each other find solutions.

We hope that readers of this volume will find that some of the problems mentioned above have been solved and others are approaching their solution.

* * *

It is a pleasure to express our thanks to Ali Achiri, computer science student at Koblenz University, who fulfilled the sometimes tedious task of preparing the authors' files (which, as usual, came in many different electronic formats) for the final camera-ready printout, as well as to all authors who also acted as reviewers and made sure that all the remarks from the enlightening discussions we had during the Dagstuhl seminar were incorporated into the final versions of the contributions. Moreover, we express our gratitude to the staff of the Internationale Begegnungs- und Forschungszentrum für Informatik at Schloß Dagstuhl who granted us a five days' stay in a very pleasant ambiance.

In addition, we want to thank the University of Koblenz–Landau who paid for Ali Achiri's valuable work, and last but not least Dr Werner Müller of Springer Verlag who showed his interest in publishing this volume at a very early stage, and thus motivated all authors to do their best in writing and revising their contributions.

Koblenz, Marburg, Guildford, and Colchester, May 1996

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