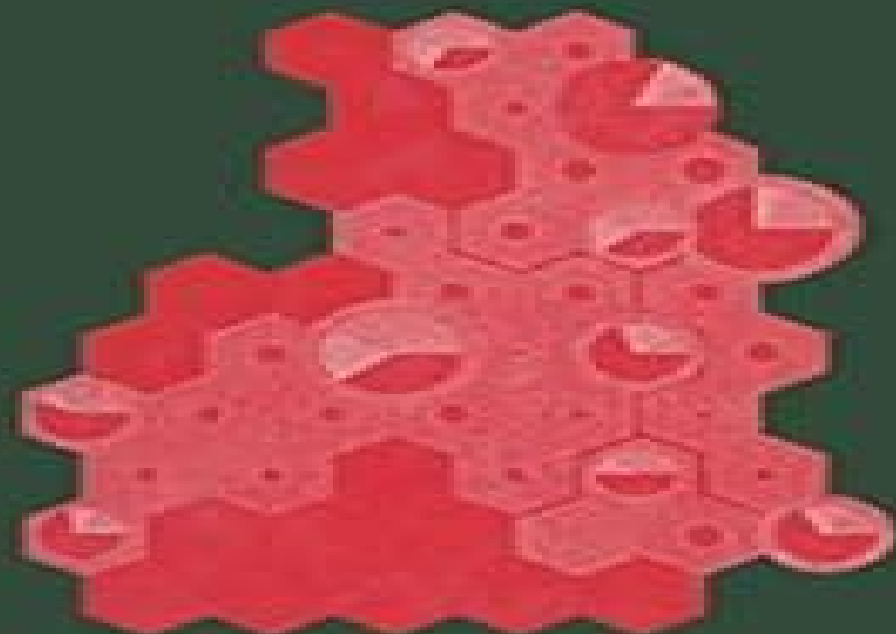


Artificial Societies

The Computer Simulation
of Social Life



Edited by

Nigel Gilbert & Rosaria Conte

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Artificial Societies The Computer Simulation Of Social Life

Ron Sun



Artificial Societies The Computer Simulation Of Social Life:

Artificial Societies Nigel Gilbert, 2006-01-31 Book Cover Book Title Title Copyright Contents Preface Notes on contributors Chapter 1 Introduction Part I The simulation of social theories Chapter 2 A model of the emergence of new political actors Chapter 3 Division of labour and social co ordination modes a simple simulation model Chapter 4 Emergence of kinship structures a multi agent approach Chapter 5 Cities can be agents too a model for the evolution of settlement systems Chapter 6 The EOS project integrating two models of Palaeolithic social change Artificial Societies G. Nigel Gilbert, Rosario Conte, 1995 *Artificial Societies* Rosaria Conte, 1995 Artificial Societies G. Nigel Gilbert, 1991

Simulation For The Social Scientist Gilbert, Nigel, Troitzsch, Klaus, 2005-02-01 Social sciences Simulation methods Social interaction Computer simulation Social sciences Mathematical models publisher *Simulating Social Phenomena* Rosaria Conte, Rainer Hegselmann, Pietro Terna, 2013-06-29 In this book experts from quite different fields present simulations of social phenomena economists sociologists political scientists psychologists cognitive scientists organisational scientists decision scientists geographers computer scientists AI and AL scientists mathematicians and statisticians They simulate markets organisations economic dynamics coalition formation the emergence of cooperation and exchange bargaining decision making learning and adaptation The history problems and perspectives of simulating social phenomena are explicitly discussed **Simulating Social Complexity** Bruce Edmonds, Ruth Meyer, 2017-11-24 This volume examines all aspects of using agent or individual based simulation This approach represents systems as individual elements having their own set of differing states and internal processes The interactions between elements in the simulation represent interactions in the target systems What makes this social is that it can represent an observed society Social systems include all those systems where the components have individual agency but also interact with each other This includes human societies and groups but also increasingly socio technical systems where the internet based devices form the substrate for interaction These systems are central to our lives but are among the most complex known This poses particular problems for those who wish to understand them The complexity often makes analytic approaches infeasible but on the other hand natural language approaches are also inadequate for relating intricate cause and effect This is why individual and agent based computational approaches hold out the possibility of new and deeper understanding of such systems This handbook marks the maturation of this new field It brings together summaries of the best thinking and practices in this area from leading researchers in the field and constitutes a reference point for standards against which future methodological advances can be judged This second edition adds new chapters on different modelling purposes and applying software engineering methods to simulation development Revised existing content will keep the book up to date with recent developments This volume will help those new to the field avoid reinventing the wheel each time and give them a solid and wide grounding in the essential issues It will also help those already in the field by providing accessible overviews of current thought The material is divided into four

sections Introduction Methodology Mechanisms and Applications Each chapter starts with a very brief section called Why read this chapter followed by an abstract which summarizes the content of the chapter Each chapter also ends with a section on Further Reading Whilst sometimes covering technical aspects this second edition of *Simulating Social Complexity* is designed to be accessible to a wide range of researchers including both those from the social sciences as well as those with a more formal background It will be of use as a standard reference text in the field and also be suitable for graduate level courses

Simulating Societies Nigel Gilbert, Jim Doran, 2018-05-15 The most exciting and productive areas of academic inquiry are often where the interests of two disciplines meet This is certainly the case for the subject of this book originally published in 1994 which explores the contribution that computer based modelling and artificial intelligence can make to understanding fundamental issues in social science *Simulating Societies* shows how computer simulations can help to clarify theoretical approaches contribute to the evaluation of alternative theories and illuminate one of the major issues of the social sciences how social phenomena can emerge from individual action The authors discuss how simulation models can be constructed using recently developed artificial intelligence techniques and they consider the methodological issues involved in using such models for theory development testing and experiment The introductory chapters situate the book within social science and suggest why the time was ripe for significant progress before defining basic terminology showing how simulation has been used to theorize about organizations and indicating through examples some of the fundamental issues involved in simulation The main body of the text provides case studies drawn from economics anthropology archaeology planning social psychology and sociology The appeal of this path breaking book was twofold It offered an essential introduction to simulation for social scientists and it provided case study applications for computer scientists interested in the latest advances in the burgeoning area of distributed artificial intelligence DAI at the time

The Dynamics and Evolution of Social Systems
Jürgen Klüver, 2013-03-09 When I started with this book several years ago I originally intended to write an introduction to mathematical systems theory for social scientists Yet the more I thought about systems theory on the one side and theoretical sociology on the other the more I became convinced that the classical mathematical tools are not very well suited for the problems of sociology Then I became acquainted with the researches on complex systems by the Santa Fe Institute and in particular with cellular automata Boolean networks and genetic algorithms These mathematically very simple but extremely efficient tools are in my opinion very well appropriate for modeling social dynamics Therefore I tried to reformulate several classical problems of theoretical sociology in terms of these formal systems and outline new possibilities for a mathematical sociology which is able to join immediately on the great traditions of theoretical sociology The result is this book whether I succeeded with it is of course up to the readers As the readers will perceive the book could not have been written by me alone but only by the joint labors of the computer group at the Interdisciplinary Center of Research in Higher Education at the University of Essen The members of the group Christina Stoica Jom Schmidt and Ralph Kier are named in several

subchapters as co authors Yet even more important than their contributions to this book were the permanent discussions with them and their patience with my new and very speculative ideas Many thanks Complex Systems Rob Stocker, Herbert Jelinek, Bohdan Durnota, 1996 Over the past few years the study of Complex Systems has proven to be a fruitful and expanding field of research Just as the number of discoveries and applications has grown so has level of acceptance in academic government and commercial environments Theoretical and practical contributions to research have continued to provide a springboard for wide ranging discoveries across many disciplines investigating complex phenomena This is the third in a series of collected studies on complexity research This volume addresses one of the central issues of complexity That is how are systems put together How do interactions between individual elements build up into the behavior or properties of an entire system The topics are Organization and Behavior of Computational Systems Criticality and Complexity Nonlinear Dynamics and Fractals Computational Problem Solving with Genetic Algorithms and Cellular Automata Evolution Learning and Artificial Neural Networks From Biological Systems to Artificial Life Cognitive and Social Action Rosaria Conte, Cristiano Castelfranchi, 1995 This monograph addresses the worlds of social science theory and artificial intelligence AI The book examines the interaction of individual cognitive factors and social influence on human action and discusses the implications for developments in artificial intelligence This book is intended for graduate and research level artificial intelligence and social science theory including sociology economics psychology **Social Emergence** R. Keith Sawyer, 2005-10-27 Can we understand important social issues by studying individual personalities and decisions Or are societies somehow more than the people in them Sociologists have long believed that psychology can't explain what happens when people work together in complex modern societies In contrast most psychologists and economists believe that if we have an accurate theory of how individuals make choices and act on them we can explain pretty much everything about social life Social Emergence takes a new approach to these longstanding questions Sawyer argues that societies are complex dynamical systems and that the best way to resolve these debates is by developing the concept of emergence focusing on multiple levels of analysis individuals interactions and groups and with a dynamic focus on how social group phenomena emerge from communication processes among individual members This book makes a unique contribution not only to complex systems research but also to social theory **Handbook of Research on Nature-Inspired Computing for Economics and Management** Rennard, Jean-Philippe, 2006-09-30 This book provides applications of nature inspired computing for economic theory and practice finance and stock market manufacturing systems marketing e commerce e auctions multi agent systems and bottom up simulations for social sciences and operations management Provided by publisher **Agent-Based Computational Sociology** Flaminio Squazzoni, 2012-04-23 Most of the intriguing social phenomena of our time such as international terrorism social inequality and urban ethnic segregation are consequences of complex forms of agent interaction that are difficult to observe methodically and experimentally This book looks at a new

research stream that makes use of advanced computer simulation modelling techniques to spotlight agent interaction that allows us to explain the emergence of social patterns It presents a method to pursue analytical sociology investigations that look at relevant social mechanisms in various empirical situations such as markets urban cities and organisations This book Provides a comprehensive introduction to epistemological theoretical and methodological features of agent based modelling in sociology through various discussions and examples Presents the pros and cons of using agent based models in sociology Explores agent based models in combining quantitative and qualitative aspects and micro and macro levels of analysis Looks at how to pose an agent based research question identifying the model building blocks and how to validate simulation results Features examples of agent based models that look at crucial sociology issues Supported by an accompanying website featuring data sets and code for the models included in the book Agent Based Computational Sociology is written in a common sociological language and features examples of models that look at all the traditional explanatory challenges of sociology Researchers and graduate students involved in the field of agent based modelling and computer simulation in areas such as social sciences cognitive sciences and computer sciences will benefit from this book Introduction to Computational Social Science Claudio Cioffi-Revilla,2013-12-31 This reader friendly textbook is the first work of its kind to provide a unified Introduction to Computational Social Science CSS Four distinct methodological approaches are examined in detail namely automated social information extraction social network analysis social complexity theory and social simulation modeling The coverage of these approaches is supported by a discussion of the historical context as well as by a list of texts for further reading Features highlights the main theories of the CSS paradigm as causal explanatory frameworks that shed new light on the nature of human and social dynamics explains how to distinguish and analyze the different levels of analysis of social complexity using computational approaches discusses a number of methodological tools presents the main classes of entities objects and relations common to the computational analysis of social complexity examines the interdisciplinary integration of knowledge in the context of social phenomena **Cognition and Multi-Agent Interaction** Ron Sun,2006 This book explores the intersection between individual cognitive modeling and modeling of multi agent interaction The Science of Science Policy Julia I. Lane,Kaye Husbands Fealing,John H. Marburger, III,Stephanie S. Shipp,2011-03-18 Basic scientific research and technological development have had an enormous impact on innovation economic growth and social well being Yet science policy debates have long been dominated by advocates for particular scientific fields or missions In the absence of a deeper understanding of the changing framework in which innovation occurs policymakers cannot predict how best to make and manage investments to exploit our most promising and important opportunities Since 2005 a science of science policy has developed rapidly in response to policymakers increased demands for better tools and the social sciences capacity to provide them The Science of Science Policy A Handbook brings together some of the best and brightest minds working in science policy to explore the foundations of an evidence based platform for the field The contributions in this book

provide an overview of the current state of the science of science policy from three angles theoretical empirical and policy in practice They offer perspectives from the broader social science behavioral science and policy communities on the fascinating challenges and prospects in this evolving arena Drawing on domestic and international experiences the text delivers insights about the critical questions that create a demand for a science of science policy

The Elgar Companion to Recent Economic Methodology J. B. Davis, 2011-01-01 Economic methodology has traditionally been associated with logical positivism in the vein of Milton Friedman Karl Popper Imre Lakatos and Thomas Kuhn However the emergence and proliferation of new research programs in economics have stimulated many novel developments in economic methodology This impressive Companion critically examines these advances in methodological thinking particularly those that are associated with the new research programs which challenge standard economic methodology Bringing together a collection of leading contributors to this new methodological thinking the authors explain how it differs from the past and point towards further concerns and future issues The recent research programs explored include behavioral and experimental economics neuroeconomics new welfare theory happiness and subjective well being research geographical economics complexity and computational economics agent based modeling evolutionary thinking macroeconomics and Keynesianism after the crisis and new thinking about the status of the economics profession and the role of the media in economics This important compendium will prove invaluable for researchers and postgraduate students of economic methodology and the philosophy of economics Practitioners in the vanguard of new economic thinking will also find plenty of useful information in this path breaking book

What levels of explanation in the behavioural sciences? Giuseppe Boccignone, Roberto Cordeschi, 2015-07-03 Complex systems are to be seen as typically having multiple levels of organization For instance in the behavioural and cognitive sciences there has been a long lasting trend promoted by the seminal work of David Marr putting focus on three distinct levels of analysis the computational level accounting for the What and Why issues the algorithmic and the implementational levels specifying the How problem However the tremendous developments in neuroscience knowledge about processes at different scales of organization together with the complexity of today cognitive theories suggest that there will hardly be only three levels of explanation Instead there will be many different degrees of commitments corresponding to the different granularities from high level behavioural models to low level neural and molecular models of the cognitive research program For instance Bayesian approaches that are usually advocated for formalizing Marr s computational level and rational behaviour have even been adopted to model synaptic plasticity and axon guidance by molecular gradients As a result we can consider the behavioural scientist as dealing with models at a multiplicity of levels The purpose of this Research Topic in Frontiers in Theoretical and Philosophical Psychology is to promote an approach to the role of the levels and explanation and models which is of interest for cognitive scientists neuroscientists psychologists behavioural scientists and philosophers of science

Multi-Agent-Based Simulation Scott Moss, Paul Davidsson, 2003-07-31 This volume is

based on papers accepted for the Second International Workshop on Multi agent based Simulation MABS 2000 federated with the Fourth International Conference on Multi Agent Systems ICMAS 2000 held in Boston in July 2000 The purpose of MABS 2000 was to investigate and develop the synergy between software engineering for multi agent systems and agent based social simulation The papers included in the MABS 2000 workshop were selected either because they explore how agent interaction can be used to build multi agent systems or they offer examples of problem oriented rather than technique oriented systems No paper was selected if it specified a model or an issue to make it a previously chosen technique All of the papers in the volume have been reviewed and in many cases revised since the workshop Two papers by Edmonds and by Hales as well as the editorial introduction have been added to those accepted for the workshop As editors and workshop organisers we are very grateful to the participants who engaged enthusiastically in the discussions about both individual papers and the issues facing the MABS community Issues raised and positions taken in those discussions are reported in the editorial introduction We are also grateful to the authors for their punctuality and the grace with which they received and responded to editorial comments and requests Klaus Fischer the ICMAS 2000 workshops chair was exceptionally patient and diplomatic in reconciling our demands with the resources available

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