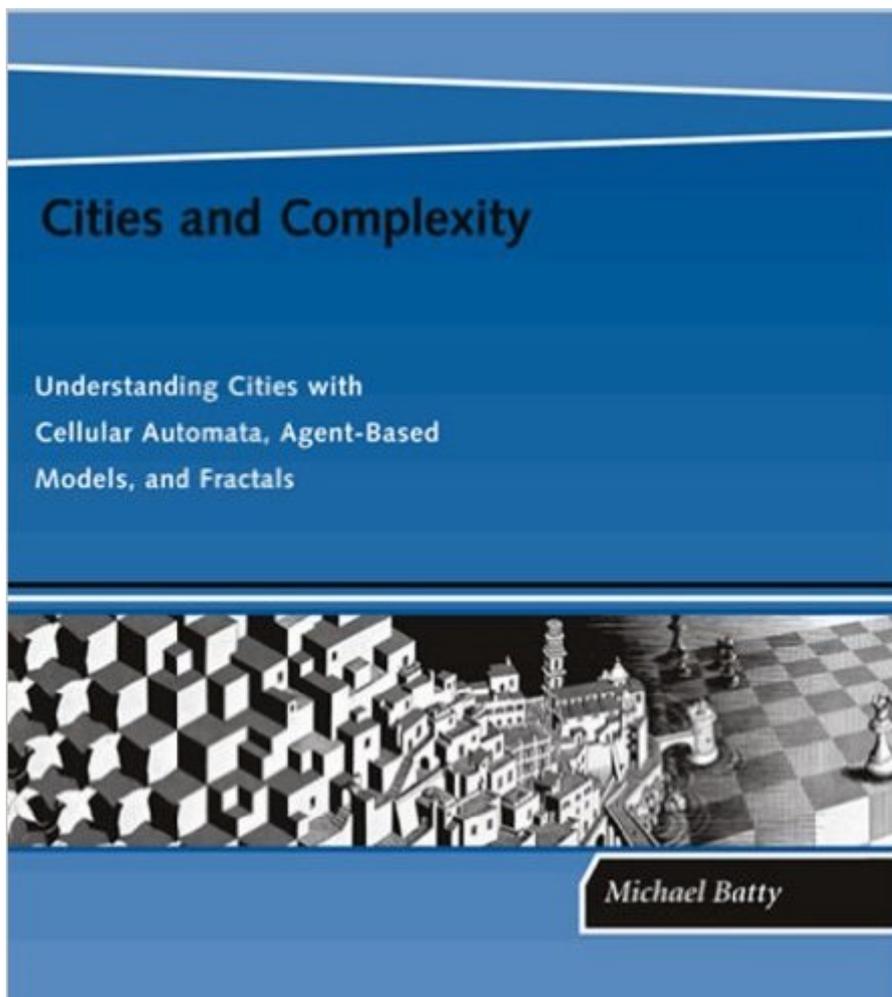# Cities And Complexity: Understanding Cities With Cellular Automata, Agent-Based Models, And Fractals (MIT Press)

Synopsis

As urban planning moves from a centralized, top-down approach to a decentralized, bottom-up perspective, our conception of urban systems is changing. In Cities and Complexity, Michael Batty offers a comprehensive view of urban dynamics in the context of complexity theory, presenting models that demonstrate how complexity theory can embrace a myriad of processes and elements that combine into organic wholes. He argues that bottom-up processes -- in which the outcomes are always uncertain -- can combine with new forms of geometry associated with fractal patterns and chaotic dynamics to provide theories that are applicable to highly complex systems such as cities.Batty begins with models based on cellular automata (CA), simulating urban dynamics through the local actions of automata. He then introduces agent-based models (ABM), in which agents are mobile and move between locations. These models relate to many scales, from the scale of the street to patterns and structure at the scale of the urban region. Finally, Batty develops applications of all these models to specific urban situations, discussing concepts of criticality, threshold, surprise, novelty, and phase transition in the context of spatial developments. Every theory and model presented in the book is developed through examples that range from the simplified and hypothetical to the actual. Deploying extensive visual, mathematical, and textual material, Cities and Complexity will be read both by urban researchers and by complexity theorists with an interest in new kinds of computational models.Sample chapters and examples from the book, and other related material, can be found at http://www.complexcity.info

Book Information

Customer Reviews

This book is an immense collection of research on the application of complex systems to urban spatial analysis. While this book is not extensive and is probably not meant as a textbook on complex systems in its entirety, I highly recommend it for those interested in urban spatial analysis. The applications of the techniques go beyond geography and are useful in sociology, economics, or urban planning. A caveat that I should add is that the book is quite dense with methods and formulas and is probably not best to approach this book without some knowledge of advanced statistics. However, the theoretical overviews provided more than allow for those without this background to get something out of it. In short, if you are a graduate student, professor, or researcher I'd recommend this book for an insightful and important take on the nature of cities and urban analysis.

Prior to buying this book there were no reviews which mentioned that this was more a textbook than an in-depth but casual read.This book is an exhaustive look at urban planning and an understanding of cities and the patterns of growth and population. While this is exactly what I was looking for, it is extremely dense and full of charts and graphs of advanced mathematical equations. I have no problem with this, however this is much more a textbook than a casual read with some interesting equations to backup the argument proposed.

Great as starting point for urban develop.This book is like "Every thing you want to know about cities growth and you, probably wouldn't think of...."Professor Batty should be consider to urban modeling as Mandelbrot is to fractals.

Cities and Complexity: Understanding Cities with Cellular Automata, Agent-Based Models, and Fractals (MIT Press) Modeling Nature: Cellular Automata Simulations with MathematicaÂ® (Sciences; 77) Complexity Explained (Springer Complexity) Cellular and Molecular Immunology (Cellular and Molecular Immunology, Abbas) Cellular Biology: Experimental Approaches to Cellular Processes and Molecular Medicine The Temporary Agent (The Agent Series) Paper Models That Move: 14 Ingenious Automata, and More (Dover Origami Papercraft) (English and English Edition) Introduction to Computation and Programming Using Python: With Application to Understanding Data (MIT Press) Understanding Bergson, Understanding Modernism (Understanding Philosophy,

Understanding Modernism) Zeitmanagement mit Microsoft Office Outlook, 8. Auflage (einschl. Outlook 2010): Die Zeit im Griff mit der meistgenutzten BÃ rosoftware - Strategien, Tipps ... (Versionen 2003 - 2010) (German Edition) The Science of Disorder: Understanding the Complexity, Uncertainty, and Pollution in Our World Ancient Maya Cities of the Eastern Lowlands (Ancient Cities of the New World) Microsoft Excel 2013 Building Data Models with PowerPivot: Building Data Models with PowerPivot (Business Skills) Home Based Business Escape Plan: How To Make $10,000 Per Month With Your Own Part-Time, Online Lifestyle Business: Home Based Business Ideas (Home Based Business Opportunities) Automata and Mechanical Toys Playing Their Parts: 19th Century Automata, Musical Boxes and Singing Birds Algorithms, Languages, Automata, And Compilers: A Practical Approach An Introduction to Formal Languages and Automata, 5th Edition An Introduction to Formal Languages and Automata Making Simple Automata