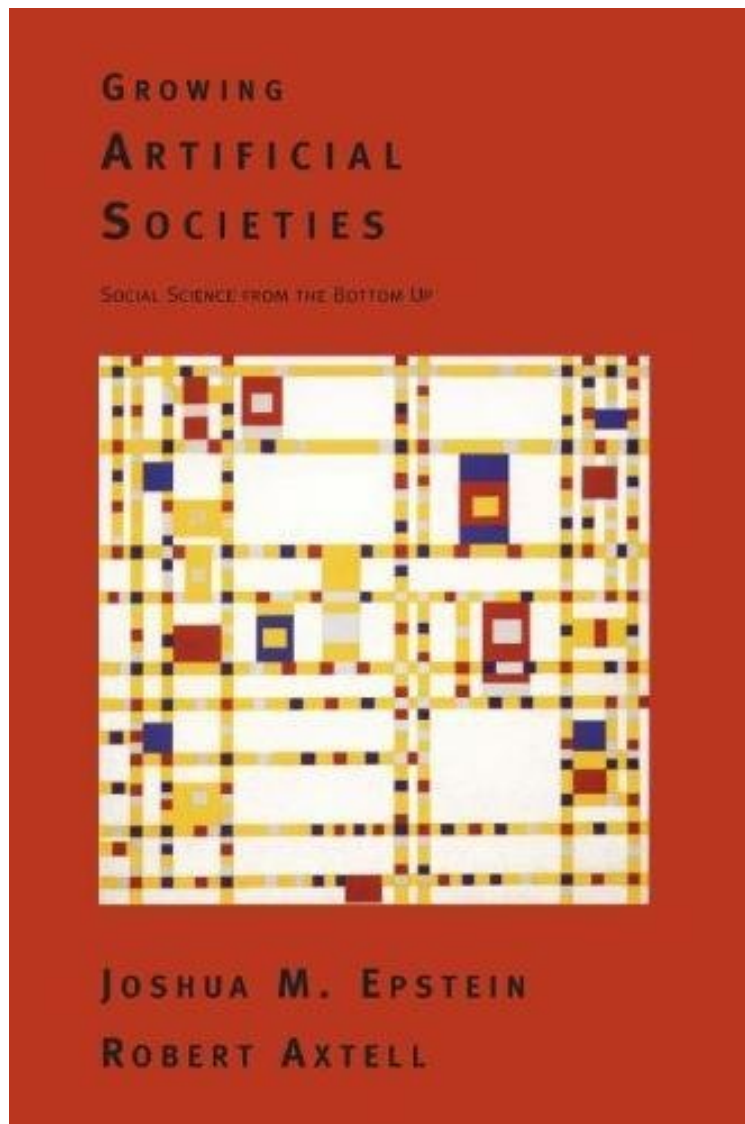


Growing Artificial Societies: Social Science From the Bottom Up (Complex Adaptive Systems)

Joshua M. Epstein, Robert L. Axtell
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Joshua M. Epstein, Robert L. Axtell : Growing Artificial Societies: Social Science From the Bottom Up (Complex Adaptive Systems) before purchasing it in order to gauge whether or not it would be worth my time, and all praised Growing Artificial Societies: Social Science From the Bottom Up (Complex Adaptive Systems):

0 of 0 people found the following review helpful. Bringing the artificial society model to life By BWolzenski This engaging, easy to read book bring the concept of artificial societies to life. Step by step, "Growing Artificial Societies"

builds a demonstration that complex collective behavior and outcomes can evolve - or grow - in a model with very simple rules for its environment and the actions of its inhabitants, or "agents." 0 of 0 people found the following review helpful. Complexity in the Social Sciences By Rajesh R Parwani An excellent text with accompanying CD that introduces the ideas of self-organisation and emergence in the context of the social sciences. 1 of 1 people found the following review helpful. A seminal work on agent based modeling By Hendrik Bright This is one of the most important books on social sciences ever published! The Sugarscape is one of the first agent based models in economics. It models agents on an island of sugar and shows some emerging patterns: the inequality of wealth due to differences in the metabolism, differences in sight and the place where the agents start their life! Without markets, inequality seems to be unavoidable if nature is left to go its way. After this second chapter, of which the importance cannot be denied, the authors spend another chapter on the impact of reproduction, acculturation and combat. All these seem to enhance inequality in the first place, but later on replacement of the population by the most successful. The most difficult part is the chapter on trade, where sugar is being exchanged for spice. Unfortunately, the authors do not succeed in developing a strong model. I am sure, a good trade model in ABM will be able to replace the flawed law of supply and demand of the neoclassical economics. This law calculates an equilibrium which is believed to be unique and efficient. Nothing is less true: an equilibrium can be attained, but only in special circumstances and after a long intermediate period in which feedback processes play an important role. Prices are determined locally: there is no single price, only a statistical average! The authors show different distributions of prices and volumes of trade. This chapter should be considered a clear falsification of neoclassical theory. Strangely, the next chapter deals with disease! They want to show agent based models can be used in several social sciences: economics, demographics, sociology and even medicine. In the concluding chapter, they repeat this objective. Unfortunately, when all the disciplines are dealt together, depth of the analysis suffers from it. A lot of emerging patterns are shown, but the very nature of the feedback processes that are at their origin, are only superficially explained. One of the weak points of a lot of ABM models is the fact that the scientists are usually very happy when they can reproduce some emerging patterns. In my opinion explaining these is even more important. All in all, this is a book that is extremely important as a basis for new methods for modeling human behaviour. Let us forget the DSGE models of the neoclassical school and let's continue on the way Epstein and Axtell have shown us!

A Brookings Institution Press and MIT Press publication How do social structures and group behaviors arise from the interaction of individuals? In this groundbreaking study, Joshua M. Epstein and Robert L. Axtell approach this age-old question with cutting-edge computer simulation techniques. Such fundamental collective behaviors as group formation, cultural transmission, combat, and trade are seen to "emerge" from the interaction of individual agents following simple local rules. In their computer model, Epstein and Axtell begin the development of a "bottom up" social science. Their program, named Sugarscape, simulates the behavior of artificial people (agents) located on a landscape of a generalized resource (sugar). Agents are born onto the Sugarscape with a vision, a metabolism, a speed, and other genetic attributes. Their movement is governed by a simple local rule: "look around as far as you can; find the spot with the most sugar; go there and eat the sugar." Every time an agent moves, it burns sugar at an amount equal to its metabolic rate. Agents die if and when they burn up all their sugar. A remarkable range of social phenomena emerge. For example, when seasons are introduced, migration and hibernation can be observed. Agents are accumulating sugar at all times, so there is always a distribution of wealth. Next, Epstein and Axtell attempt to grow a "proto-history" of civilization. It starts with agents scattered about a twin-peaked landscape; over time, there is self-organization into spatially segregated and culturally distinct "tribes" centered on the peaks of the Sugarscape. Population growth forces each tribe to disperse into the sugar lowlands between the mountains. There, the two tribes interact, engaging in combat and competing for cultural dominance, to produce complex social histories with violent expansionist phases, peaceful periods, and so on. The proto-history combines a number of ingredients, each of which generates insights of its own. One of these ingredients is sexual reproduction. In some runs, the population becomes thin, birth rates fall, and the population can crash. Alternatively, the agents may over-populate their environment, driving it into ecological collapse. When Epstein and Axtell introduce a second resource (spice) to the Sugarscape and allow the agents to trade, an economic market emerges. The introduction of pollution resulting from resource-mining permits the study of economic markets in the presence of environmental factors. This study is part of the 2050 Project, a joint venture of the Santa Fe Institute, the World Resources Institute, and the Brookings Institution. The project is an international effort to identify conditions for a sustainable global system in the middle of the next century and to design policy actions to help achieve such a system.

.com Growing Artificial Societies is a groundbreaking book that posits a new mechanism for studying populations and their evolution. By combining the disciplines of cellular automata and "artificial life", Joshua M. Epstein and Robert Axtell have developed a mechanism for simulating all sorts of emergent behavior within a grid of cells managed by a computer. In their simulations, simple rules governing individuals' "genetics" and their competition for foodstuffs result in highly complex societal behaviors. Epstein and Axtell explore the role of seasonal migrations, pollution,

sexual reproduction, combat, and transmission of disease or even "culture" within their artificial world, using these results to draw fascinating parallels with real- world societies. In their simulation, for instance, allowing the members to "trade" increases overall well-being but also increases economic inequality. In *Growing Artificial Societies*, the authors provide a workable framework for studying social processes in microcosm, a thoroughly fascinating accomplishment. "Computer simulations are changing the frontiers of science. *Growing Artificial Societies* is an outstanding example of why; it shows how sociocultural phenomena like trade, wealth, and warfare arise naturally out of the simple actions of individuals. This illuminating, entertaining book will set the standard for the practice of social science in the 21st century." (John L. Casti, Santa Fe Institute)"Epstein and Axtell present an exciting theoretical version of an integrated social science built on simple and explicit microfoundations." (Sidney G. Winter, Wharton School of Business) *Growing Artificial Societies* is a milestone in social science research. It vividly demonstrates the potential of agent-based computer simulation to break disciplinary boundaries. It does this by analyzing, in a unified framework, the dynamic interactions of such diverse activities as trade, combat, mating, culture, and disease. It is an impressive achievement. (Robert Axelrod, University of Michigan)From the Back Cover*Growing Artificial Societies* is a milestone in social science research. It vividly demonstrates the potential of agent-based computer simulation to break disciplinary boundaries. It does this by analyzing in a unified framework the dynamic interactions of such diverse activities as trade, combat, mating, culture, and disease. It is an impressive achievement.'