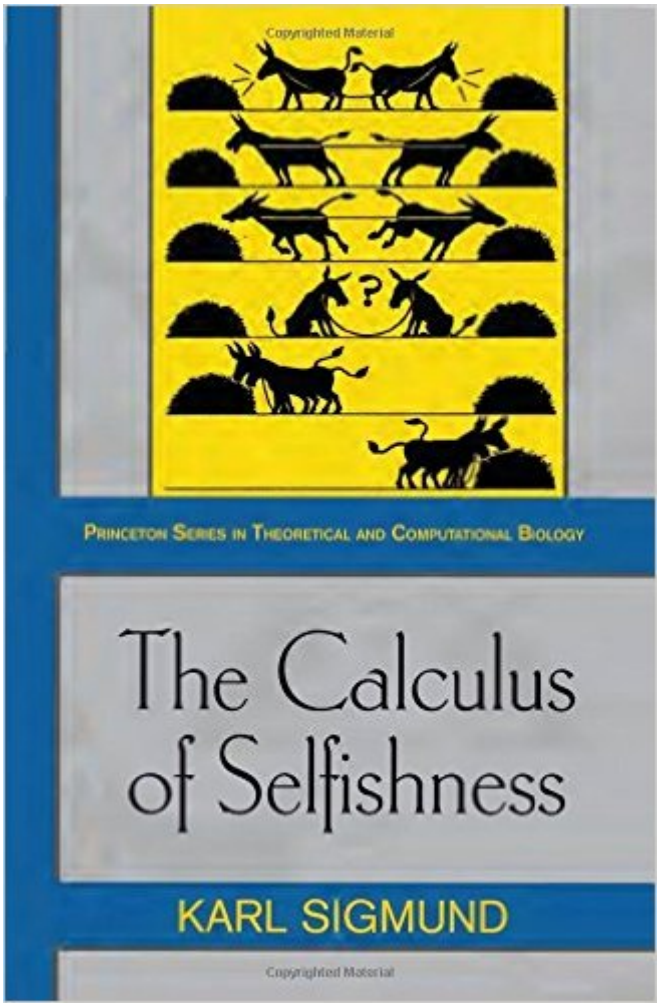
The Calculus Of Selfishness: (Princeton Series In Theoretical And Computational Biology)



Synopsis

How does cooperation emerge among selfish individuals? When do people share resources, punish those they consider unfair, and engage in joint enterprises? These questions fascinate philosophers, biologists, and economists alike, for the "invisible hand" that should turn selfish efforts into public benefit is not always at work. The Calculus of Selfishness looks at social dilemmas where cooperative motivations are subverted and self-interest becomes self-defeating. Karl Sigmund, a pioneer in evolutionary game theory, uses simple and well-known game theory models to examine the foundations of collective action and the effects of reciprocity and reputation. Focusing on some of the best-known social and economic experiments, including games such as the Prisoner's Dilemma, Trust, Ultimatum, Snowdrift, and Public Good, Sigmund explores the conditions leading to cooperative strategies. His approach is based on evolutionary game dynamics, applied to deterministic and probabilistic models of economic interactions. Exploring basic strategic interactions among individuals guided by self-interest and caught in social traps, The Calculus of Selfishness analyzes to what extent one key facet of human nature--selfishness--can lead to cooperation.

Book Information

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Customer Reviews

I have noticed in recent years a tendency for agent-based modelers to consider their craft as an alternative to analytical model-building. This is lamentable for two reasons. First, an agent-based computer model is a perfectly well defined mathematical structure, that off a finite Markov process.

Under quite general circumstances a Markov process has a stationary distribution that characterizes its long-term behavior. In most cases, however, the transition matrix associated with an agent-based model will be much too large to use for the analytical solution for the stationary distribution. The computer simulation is an empirical estimation of the properties of the Markov process. Second, agent-based programmers often pride themselves on being ignorant of dynamical systems theory, which they consider old-fashioned (see, for instance, Stephen Wolfram's A New Kind of Science (2002) for a particularly egregious example of computer modeling euphoria). This is a rather questionable stance, because the solid research with which I am acquainted uses agent-based modeling as one tool among many in the study of complex dynamical systems.Enter Karl Sigmund, an accomplished mathematician with a serious love affair for the evolutionary modeling of social life, as witnessed by his previous contribution, Games of Life (Penguin Books, 1995). Sigmund develops classical game theory as well as the evolutionary game theory that takes a classical game as its stage game, which it embeds in a population structure such that sets of agents meet in each period and play the stage game. Periodically, more successful agents reproduce and less successful agents die off, as in a Darwinian dynamic.

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