Solan

A Course in Stochastic Game Theory

Stochastic games are have an element of chance: the state of the next round is determined probabilistically depending upon players' actions and the current state. Successful players need to balance the need for short-term payoffs while ensuring future opportunities remain high. The various techniques needed to analyze these often highly non-trivial games are a showcase of attractive mathematics, including methods from probability, differential equations, algebra, and combinatorics. This book presents a course on the theory of stochastic games going from the basics through to topics of modern research, focusing on conceptual clarity over complete generality. Each of its chapters introduces a new mathematical tool – including contracting mappings, semi-algebraic sets, infinite orbits, and Ramsey's theorem, among others – before discussing the game-theoretic results they can be used to obtain. The author assumes no more than a basic undergraduate curriculum and illustrates the theory with numerous examples and exercises, with solutions available online.

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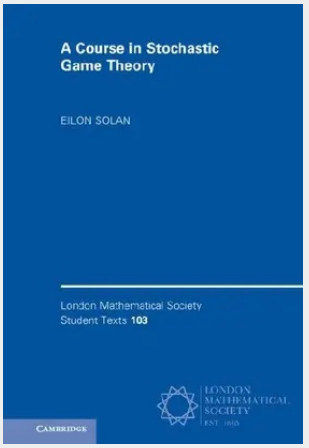

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