

Stochastic Games: Algorithms and Existence Theorems
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Solving structured stochastic games for optimal strategies (zero sum) and Nash equilibrium strategies (non-zero sum).

Preliminaries:

Linear Programming, duality and linear complementarity. Minimax theorem for matrix games and Nash equilibrium theorem for bimatrix games. Contraction maps.

Markov Decision Processes:

Stochastic matrices and basic notions of stationary Markov chain, Finite horizon Markov Decision processes. Secretary problem, Investment problems. Discounted and undiscounted payoffs. Optimality equation. Constructive approaches to discounted and undiscounted Markov Decision Processes via linear programming and policy improvement algorithms.

Stochastic games and orderfield property:

Examples of structured stochastic games with order field property. Value for stochastic games via contraction mapping.

Policy improvement algorithms for: stochastic games of perfect information, stochastic games with additive rewards and additive transitions. Single controller stochastic games and LP algorithms. Non-zero sum stochastic games. Solving for Nash equilibria for discounted and undiscounted single controller stochastic games and stochastic games of perfect information.