

Subgame perfect epsilon-equilibrium in games of perfect information: a review

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Abstract

Subgame perfect epsilon-equilibrium (epsilon-SPE) is a strategy profile such that no player has a deviation, after any history of play, yielding a payoff increase of more than epsilon. Equivalently, epsilon-SPE could be defined as a strategy profile that induces an epsilon-Nash equilibrium in each subgame. It is a refinement of epsilon-Nash equilibrium serving to eliminate non-credible threats. In this talk, we provide an overview of recent literature on epsilon-SPE in perfect information games. We review both positive and negative results. Positive results include the existence of epsilon-SPE in games with lower semicontinuous payoffs, in games with upper semicontinuous payoffs, in games with qualitative objectives, and in games that are continuous outside a thin set. Negative results include some remarkable counterexamples to existence. We also briefly review variations of the concept such as one-deviation strategy profile, finite-deviation strategy profile, or weak epsilon-SPE. In essence, these concepts only require robustness to one-shot deviations, or to deviation at finitely many histories. These concepts proved to be important for the analysis of epsilon-SPE. We conclude with some open questions.