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TITLE: An Epistemic Approach to Stochastic Games

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In this talk I will focus on stochastic games with finitely many states and actions. For this setting I study the epistemic concept of common belief in future rationality, which is based on the condition that players always believe that their opponents will choose rationally in the future. We distinguish two different versions of the concept -- one for the discounted case with a fixed discount factor δ , and one for the case of uniform optimality, where optimality is required for "all discount factors close enough to 1".

I show that both versions of common belief in future rationality always yield non-empty predictions for every stochastic game. This is in sharp contrast with the non-existence of subgame perfect equilibrium in many stochastic games under the uniform optimality criterion. I also provide an epistemic characterization of subgame perfect equilibrium for 2-player stochastic games, showing that it is essentially equivalent to common belief in future rationality together with some "correct beliefs assumption".