Learning Bayes-Nash Equilibria in Auctions

Martin Bichler

Technical University of Munich

Abstract

Equilibrium problems in Bayesian auction games can be described as systems of differential equations. Depending on the model assumptions, these equations might be such that we do not have a rigorous mathematical solution theory. The lack of analytical or numerical techniques with guaranteed convergence for the equilibrium problem has plagued the field and limited equilibrium analysis to rather simple auction models such as single-object auctions. Recent progress in equilibrium learning led to algorithms that find equilibrium under a wide variety of model assumptions. The talk will summarize empirical results and theoretical insights on the convergence of equilibrium learning algorithms.