Estimating Dynamic Discrete Choice Games of Incomplete Information

Che-Lin Su
Joint work with Michael Egesdal and Zhenyu Lai at Harvard University
The University of Chicago Booth School of Business
Email: che-lin.su@chicagobooth.edu

We investigate the estimation of models of dynamic discrete-choice games of incomplete information, formulating the maximum-likelihood estimation exercise as a constrained optimization problem which can be solved using state-of-the-art constrained optimization solvers. Under the assumption that only one equilibrium is played in the data, our approach avoids repeatedly solving the dynamic game or finding all equilibria for each candidate vector of the structural parameters. We conduct Monte Carlo experiments to investigate the numerical performance and finite-sample properties of the constrained optimization approach for computing the maximum-likelihood estimator, the two-step pseudo maximum-likelihood estimator and the nested pseudo-likelihood estimator, implemented by both the nested pseudo-likelihood algorithm and a modified nested pseudo-likelihood algorithm.