

A Fictitious Play Approach to Complex Systems Optimization

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Complex systems consisting of a large number of interacting components are in practice increasingly modeled through computer simulations rather than via traditional equation based approaches. The resulting model typically allows for little or no structural assumptions on the form of the objective function or constraints, thus posing a challenging optimization problems. We explore in this talk a novel optimization paradigm inherited from game theory that animates the components of the system within a non-cooperative game of identical interest. The optimizations take place though individual best replies of the players, thus vastly reducing the dimensionality of the optimization problems solved (the components' joint interactions are reflected indirectly through their shared objective function). We will illustrate the approach by discussing an application to intelligent transportation systems. Opportunities for NSF funding in Operations Research will be discussed at the end of the talk.

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3:30pm-5:00pm

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