Springer Theses
Recognizing Outstanding Ph.D. Research

Ali Kakhbod

Resource Allocation in Decentralized Systems with Strategic Agents

An Implementation Theory Approach

Springer

Ali Kakhbod

Resource Allocation in Decentralized Systems with Strategic Agents: An Implementation Theory Approach (Springer Theses)

This thesis presents a substantial contribution to decentralized resource allocation issues with strategic agents. The exposition, although extremely rigorous and technical, is certainly elegant and insightful which makes this thesis work easy to get at to those just getting into this field and will also be very much appreciated by professionals in the field. (C1). For the energy allocation and spectrum posting problem, he developed a casino game form that possesses the second and third properties as detailed above plus a fourth home: the allocations corresponding to all NE of the overall game induced by the mechanism are Pareto optimal. (C2). Multi-rate multicast service provisioning in wired systems. Power allocation and spectrum posting in multi-consumer multi-channel wireless conversation systems. (C3). Problems in (C1) are marketplace problems; problems in (C2) certainly are a mix of markets and open public goods; complications in (C3) are general public items. Dr. Kakhbod developed video game forms/mechanisms for unicast and multi-rate multicast provider provisioning that possess specific properties. Initial, the allocations corresponding to all or any Nash equilibria (NE) of the video games induced by the mechanisms are optimum solutions of the corresponding centralized allocation complications, where the objective is the maximization of the sum of the agents' utilities. Third, the spending budget is well balanced at the allocations corresponding to all NE of the overall game induced by the system and also at all other feasible allocations. Second, the strategic agents voluntarily participate in the allocation procedure. Unicast provider provisioning in wired networks. The thesis contributes to the condition of the artwork of mechanism design theory. Specifically, designing effective mechanisms for the class of issues that are a mix of markets and open public goods, for the first time, have been tackled in this thesis. The study focused on three classes of problems arising in communication networks.