

Efficient Computational Approaches and Their Applications

Abstract: In a smart grid context, a demand response strategy of electric vehicle charging is modelled by a stochastic game, where a big data analytic framework is proposed for controlling the electric vehicle charging behaviours. We will also look at Plug-In Electric Vehicles (PEVs) Charging: Feeder Overload Control problem. Moreover, a two-stage stochastic game theoretical model is proposed for energy trading problem in a multi-energy microgrid system. Concerning the privacy, a research branch of reinforcement learning (RL) that dominates distributed learning for years will be presented by making the first attempt to apply RL-based algorithms in the energy trading game among smart microgrids where no information concerning the distribution of payoffs is a priori available and the strategy chosen by each microgrid is private to opponents, even trading partners. To solve this challenge, a new energy trading framework based on the repeated game that enables each microgrid to individually and randomly choose a strategy with probability to trade the energy in an independent market so as to maximize his/her average revenue.