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Multi-Agent Reinforcement Learning for Collaborative Decision-Making in Network Optimization

Friday, June 21, 2024 12:00 PM (30 minutes)

Abstract: Reinforcement Learning has demonstrated tremendous success in many challenging tasks with superhuman performance. Nevertheless, many of the decision-making problems in network optimization/scheduling naturally involve the participation of multiple decision-making agents (e.g., a network of routers/switches and a group of decentralized controllers) and thus need to be modeled as Multi-Agent Reinforcement Learning (MARL) problems. As the number of agents grows, we start to encounter "the curse of many agents"– the exponential growth of MARL problem space significantly hinders the development of collaborative exploration strategies as well as the learning of joint decision-making policies. In this talk, we will present our recent research on multi-agent learning algorithms and multi-agent option/skill discovery, as well as their applications to traffic engineering, scheduling, and 5G slice management.

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