Meta-level control of multiagent learning in dynamic repeated resource sharing problems.

Summary: In this article, we propose two methods to adapt parameters in multi-agent reinforcement learning (MARL) for repeated resource sharing problems (RRSP). Resource sharing problems (RSP) are important and widely-applicable frameworks on MARL. RRSP is a variation of RSP in which agents select resources repeatedly and periodically. We have been proposing a learning method called Moderated Global Information (MGI) for MARL in RRSP. However, we need carefully adapt several parameters in MGI, especially temperature parameter $T$ in Boltzmann selection in agent behavior and modification parameter $L$, to converge the learning into suitable states. In order to avoid this difficulty, we propose two methods to adjust these parameters according to the performance of each agent and statistical behaviors of agents. Results of several experiments tell us that the proposed methods are robust against changes of environments and force agent-behaviors to the optimal situation.