Overview of Multi-agent Reinforcement Learning in Game Playing

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**What is MARL?**

Multi-agent RL (MARL) defines a setting where multiple agents are trying to maximize their own long-term result by taking sequential decisions that interact with the environment and each other.

**MARL Settings**

* Cooperative: agents share the reward function
* Competitive: Zero-sum Markov Games
* Mixture: general-sum game setting

**League Training MARL**

Self-play algorithms, similar to those used in chess and go, learn rapidly but may chase cycles (for example, where A defeats B, and B defeats C, but A loses to C) indefinitely without making progress.

This league of potential opponents includes a diverse range of agents, as well as their policies from both current and previous iterations. At each iteration, each agent plays games against opponents sampled from a mixture policy specific to that agent.

**Conclusion**

This league of potential opponents includes a diverse range of agents, as well as their policies from both current and previous iterations. At each iteration, each agent plays games against opponents sampled from a mixture policy specific to that agent. Given the prevalence of sequential decision-making with several agents coupled in their actions and knowledge, Multi-Agent Reinforcement Learning (MARL) has long been an active and significant research field in reinforcement learning. Theoretical comprehension of MARL algorithms is well recognized to be difficult and somewhat weak in the literature, in stark contrast to its enormous practical success. Indeed, developing a comprehensive theory for MARL necessitates the use of tools from dynamic programming, game theory, optimization theory, and statistics, all of which are difficult to unite and study in a single context.