Neeraj Vashistha (190573735)

EECS7002P Assignment 1

Individual Contribution

In this assignment, we studied Multiagent Pommerman Game and understood its implementation on different algorithms such as OSLA, MTCS and RHEA with FFA and team based mode. After getting an idea about the structure of the code and how it works, we went back and studied MTCS and RHEA and Reinforcement Learning in depth. We divided the research work in three most promising field of AI which were RHEA, MCTS and Reinforcement Learning, to decide which approach to follow for the assignment.

The starting phrase of the assignment was tasked to study the code of MCTS and explore the research done in the field of MCTS and tuning. Various other game models like Multi-arm Bandit and Go too were evaluated. During the research of MCTS other reinforcement learning techniques such as genetic programming too were checked but were later considered out of the scope of the assignment. MCTS is a well formulated algorithm with four basic steps, Selection, Expansion, Rollout and Back-propagation. And an active research is ongoing on all the four steps in-order to improve the working of each. The Reinforcement Learning Control Policy in MCTS is implemented using UCB1 technique of exploration and exploitation which we considered to explore more and we found various other games with several other tree policies which sounded optimistic to implement. These tree policies included variants of UCB such as UCBTuned, UCB-Bayesian along with greedy policies and AMAF and its variants. The objective of this analysis was to bring about the best tree policy that could give the best results and could be tested for other advanced players with different heuristics. This part of the problem of problem formulation was predominantly solved by me and while working on tree policy evaluation.