
RL-reversi

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1 Problem Statement

We are working on using Reinforcement Learning to teach an agent to play the game Reversi/Othello through self-play.

2 Feasibility

In this section, we will explore how the fundamental concepts of reinforcement learning (RL) can be applied to Othello, with a focus on connecting the game to abstract ideas such as agents, an environment, actions, and short-term as well as long-term rewards. This projects aims to employ RL algorithms to create intelligent agents that mimic human players capable of making strategic decisions. These agents will interact with the game's environment, an 8×8 grid by selecting legal actions governed by an adaptive algorithm, learning optimal policies and strategies that maximize cumulative rewards. These rewards can be in the form of,

- Short-term rewards, such as capturing opponent discs, and
- Long-term rewards, such as the desired end-state of dominating the board, and winning the game.

This project's goal focuses on the different methods of using RL, including using reinforcement learning techniques such as Deep Q-Learning, Q-tables, and Self-play to train agents for Othello. The challenges include optimizing against the fact that the 8×8 sized board contains approximately 3^{64} possible states, each with an set of actions ≥ 0 , which prevent the use of simple enumerative techniques and requires more sophisticated algorithms. The potential of the use of RL algorithms appears to be worthwhile to explore, allowing us to master complex strategy games like Othello.

3 Milestones

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Table 1: Milestone Dates

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Date	Milestone
30/10/2023	Enviroment Demo
06/12/2023	Result Demo
10/12/2023	Project Report

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The References are in APA style

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