

The main interest of mine on the final project is to implement Connect-4 using methods from deep reinforcement learning. The aim for it is to be a replication and an attempt to match the previous studies on this game.

Dabas et al. (2022), has published a paper on Connect-4. In their research, they trained 3 different agents using different methods and competed them against each other in order to pick the best performing agent among 3.

Another interesting study with Connect-4 was introduced by Wäldchen et al. (2022), where they have experimented with XAI (explainable AI) and trained the agent while randomly hiding the color information of the tokens. So, the agent would not have the full color information in the next frame. Both the agents, that compete with each other, do not have memories. Even though, I would abstain myself from going into XAI, hiding the information randomly sounds fun to experiment with. Of course, it depends on the time available to implement this, even in a basic way. Thus, it is only an additional goal of the project.

For my final project, therefore, I propose to look into Connect-4 and see what kind of technique would suit the best while tweaking the rewards and some other hyperparameters from Dabas et al.'s paper. Moreover, one can look more into connection of more than 4 tokens just simply by adjusting the game settings. Maybe, we can find interesting results with different selection of game size. Even though, hiding the color information is not the main goal and only a suggestion, it could take the replication to the next level. After the analysis of the agent performance, there is also a chance to see how it performs against a human opponent.

References

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