Reinforcement Learning Project: RL for the darts game

Reinforcement Learning
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Contents

Chapter 1

Progress report

We have not yet made much progress yet so this report will be quite short still.

1.1 Environment

We started to implement the environment. We would like to include the position of the darts on the board as an effect on the accuracy for following darts. Each throw will have a base probability to fail but going for more complicated shots, like a triple, will also have a higher probability to land on a neighbour cell. Thus not giving the reward the agent was willing to get with its action. This appraoch is interesting for observing different skill levels as high reward shots are also high risk as the best cells are next to low valued ones, so going for more average shots might be a better solution overall for low skilled players. An action represents the cell the agent want to target identified by a discrete value.

1.2 Algorithms

As the environment is not complete, we didn't start implementing the algorithm but we are exploring some options. Should the reward be continuous (the number of points scored by a throw) or sparse (did we win or not) ? This could encourage the agent to better setup for the end game. Indeed, it is better to start a turn with a score of 16 than a score of 17 because the winning throw must be on a double or triple area and we would like the agent to consider such positionning. In the idea of a continuous reward, we could implement sarsa so it can predict that a shot can impede the next one (because previous darts make more difficult to aim in the same area). On the other hand, with a sparse reward, we could implement a curiosity-driven algorithm like we have seen in the seminar.