Writeup TRON

• A full description of how your bot works. Your description should enable its reader to replicate your bot.

Our bot uses alpha-beta pruning with a cutoff depth of 1, using a heuristic we created.

The heuristic we created found all the possible squares that our bot could reach before the enemy bot and weighted them by their attributes, then subtracted the squares the enemy bot could reach before our bot, also weighted by their attributes. We did this by iterating between the two bots and expanding the given bot’s frontier by all the safe moves that the given bot could make. We weighted open squares to equal 1, while powerups equaled 10. The frontier did not expand into walls or barriers. If we iterated to a bot, but its frontier was empty, we just skipped back to the other bot.

We tried higher cutoff depths, but they had worse results against the TA bots, so therefore we are only at 1 cutoff, which sounds silly because it doesn’t really use alpha-beta pruning or min-max. It just maximizes the next state for our bot. But, that’s the empirical data we gathered.

• Brief descriptions of the motivations behind each of the important decisions you made about how your bot works.

We used alpha-beta pruning to minimize decision time making. We used the heuristic because it would encourage the bot to cutoff space from the other bot, therefore maximizing the amount of squares it could reach. We also weighted powerups, so therefore our bot would prioritize gaining access to the powerups.

• A description of any known shortcomings of your bot, and specifically how you would attempt to improve upon them if you had more time. Answering this question is not necessary but will reduce the number of points lost from shortcomings that we notice.

Our bot doesn’t really discriminate between powerups, as they are all weighted equally at 10. Additionally, powerups like speed would not be useful if we are cut off from the opponent. To account for this, we could check if the two bots are separated completely and make speed an invalid move. Additionally, we could account for armor by when adding it to the frontier, it creates a new frontier where it expands past current barriers.