

Mini-Project Proposal (CS 5804 - Intro to AI)

(1) Participants

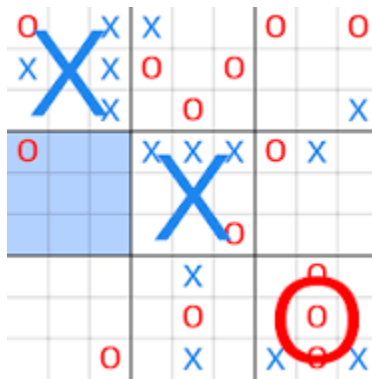
- Miguel Alonso
- Nicholas Raines
- Pierre Sarabamoun

(2) AI problem

We want to create an AI agent to play ultimate tic-tac-toe (UTTT). Unlike tic-tac-toe which is a trivial game that is easily played game-theory optimally, UTTT complicates the game significantly. UTTT's game board is similar to a 3x3 tic-tac-toe board, but each cell of the 3x3 board is another 3x3 tic-tac-toe game, the winner of which decides whether the outer board is an 'x' or an 'o'. Additionally, when a player places an 'x' or an 'o' in one of the inner boards, the next player's move has to be in the corresponding cell of the outer board. For example, if a player places an 'x' in the middle square of the inner board located at the top left corner of the outer board, then the next player would have to place an 'o' somewhere in the outer board's middle square. If this would redirect the player to a board that has already been completed then the player is allowed to place their next move in any of the inner squares that they would like. The following link provides a visual explanation of the rules of the game.

<https://www.youtube.com/watch?v=37PC0bGMiTI>

We plan to create an AI that will play UTTT optimally against a real player in real time.



(3) Initial Project Proposal

The project itself would be 3 parts:

1. Creating the game environment itself and making sure the game is playable.
2. Creating the AI or model that will be trained on the game/environment. We intend to use min-max agents with alpha-beta pruning for increased efficiency.
3. Creating a graphic display of the games as they go on to allow us to visually see the games be played by the AI

If there is still time towards the end of the semester we also want to potentially create an AI or model in different ways and pin them against each other. As well as make the GUI take user input so you can play against the bot