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CS 224 Semester Project

# Explanation of our Idea

Our goal is to create a functional game representation of tic-tac-toe extending into the third dimension. Players will play the game in a GUI with the option to play player vs player, or player vs AI. A stretch goal for this project is to create a fully optimal player agent to choose the best position in the 3d game space possible. The python code will communicate back and forth between the UI to the backend using the pygame library. This will allow us to listen for events happening on the screen: such as mouse clicks and button presses and embed our logical factors for win conditions and allowable piece placements.

## How it’s played

A 3d game of Tic-Tac-Toe is played like the original except that there is another dimension to consider when placing either your ‘X’ or ‘O’. You can win by having a straight line of three pieces lined up contiguously across horizontally, vertically, diagonally and spanning the 3rd dimension upwards in the same ways.

# Main Challenges

Learning how to use new libraries in python. Creating a user-friendly GUI that will clearly display and control the game. Creating a fully featured computer agent to play against with different levels of difficulty. A basic implementation would be for it to select from all possible positions on the board state allowed to place and picking one position randomly. Another more intelligent algorithm would be to consider if the other player is close to winning and thwarting their effort. The stretch goal for our project would be to consider solving the 3-dimensional tic tac toe game for the computer agent to place their piece in the optimal board position 100 percent of the time.

# Modules

* Pygame - <https://github.com/pygame/pygame>
* PyOpenGL - <http://pyopengl.sourceforge.net/index.html>
* Numpy - <https://github.com/numpy/numpy>

# Tools

* Github
* IDLE
* Atom
* PyCharm

# Other Languages

* None