CS 480, Senior Project Proposal

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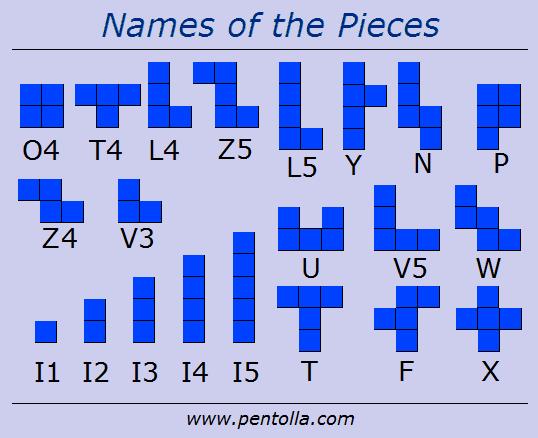
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# Project Introduction

We would like to make an online replica of the turn-based strategy game [Blokus](https://en.wikipedia.org/wiki/Blokus). Players own an identical set of polyominoes. Players take turns placing a polyomino on the board. The first move is in a designated location; depending on the game variation, this could be a corner or closer in to the center of the board. Following polyominoes must be placed at the corner of the player’s previously placed polyominoes. However, the same piece may border opponents’ polyominoes anywhere. A player is out when they can no longer make valid moves. The game ends when all players are out of moves. Each square of a polyomino is worth one point. The player with the most points on the board wins.

The game will be one versus one; human versus human, AI versus human, and AI versus AI.

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# Grading Scale

## Core Functionality (end goals)

### Primarily server side

Server manages game state - 8

Ability to go human vs human or human vs AI - 3

Detect possible moves - 4

### Primarily client side

Start screen with settings - 2

Text chat - 1

Displays current board, each player’s remaining polyominoes, and current scores - 6

Replay system

* Review recorded match from uploaded file - 5
* Step through turns – 3

### Client and server elements

Create a notation for recording match moves - 4

Any player can surrender at any time - 2

Players place polyominoes - 4

Detect when the game is over, determine winner, and display win screen - 2

Download match as a file - 4

## Polish

Consistent, smooth, and sharp visual style - 6

User on client-side can rearrange unused polyominoes - 4

Notify the player when it is their turn - 1

Editable username - 1

Sound effects - 2

AI profile pictures - 1

Some way to contact us, the creators - 1

Highlight the player’s open corners - 2

Highlight the possible placements of the selected piece at specific orientation - 2

Highlight each players’ most recently placed polyomino - 1

## AI

Research the fundamentals of machine learning - 11

Design a learning system with an Evaluation function for Blokus 1v1 - 24

AI has different difficulties - 5

## Extra Credit

Machine generated evaluation algorithm - 10

Live preview of the piece each player is manipulating - 4

AI has chat personalities (taunts and applaud good and bad moves) - 2

AI profile animated reactions - 1

Polyomino rotation animation - 1

Polyomino flip animation - 1

Store previous matches on server - 5

Create an evaluation algorithm that works for four players – 15

Use python for AI – 3

# Grading Scale

A 92+

A- 90-91

B+ 87-89

B 83-86

B- 80-82

C+ 77-79

C <=76

# Technologies to be used

Typescript

Mocha

Browserify

NodeJs

NPM

Pug

## Technologies to research

React

CSS Grid

Sass

Bootstrap

Redux

Gulp

Tensor Flow