

Pente

Project 3 - 3D Interface of a Game

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1 Instructions to run the game

1. Unzip .zip file;
2. Initialize a localhost server;
 - (a) Open the terminal;
 - (b) Navigate to the project folder;
 - (c) Run the command: **python -m SimpleHTTPServer 8080**;
3. Initialize the prolog server;
 - (a) Open another terminal window;
 - (b) Navigate to the folder named "prolog" inside the project folder;
 - (c) Run SICSTUS;
 - (d) Consult the file "server.pl" inside SICSTUS;
 - (e) Run the command: **server.** inside SICSTUS;
4. Open the link http://localhost:8080/LAIG3_T1_G08/ on the web browser.

2 Game rules

There are two winning conditions, same for Player 1 and Player 2:

- Form an unbroken chain of 5 or more consecutive friendly stones (vertically, horizontally or diagonally).
- Capture a total of 10 enemy stones.

2.1 Captures

Captures occur when two friendly adjacent stones (and only two) become bracketed by a pair of enemy stones (Fig.1). Captures may arise in any direction.

2.2 Rules

- The first move must always be in the center.
- Tournament Rule: The first player's second move is restricted – it must be at least three intersections away from the center (that is, outside the board's middle 5x5).

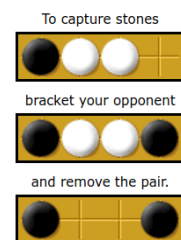


Fig. 1. Capture

3 User instructions

Interface Options:

- **currentView**: change the camera view;
- **currentAmbient**: change the scene ambients;
- **Pente**: game options/settings;
 - **Status**: displays the current game state;
 - **Seconds/Turn**: change the maximum number of seconds each player have per turn;
 - **Game Modes**: select one of the game modes to start the a game;
 - **Options**: game and bot options;
 - * **Tournament**: the game is played by the tournament rules;
 - * **Difficulty**: change the bot difficulty;
 - * **Custom**: select this to change the settings from the bot difficulty;
 - **Actions**: game actions;
 - * **Undo**: undo the last game move, can be used to undo until the start of the game;
 - * **Reset**: resets current game;
 - * **Replay**: replays all the moves done in the last game when it's finished.

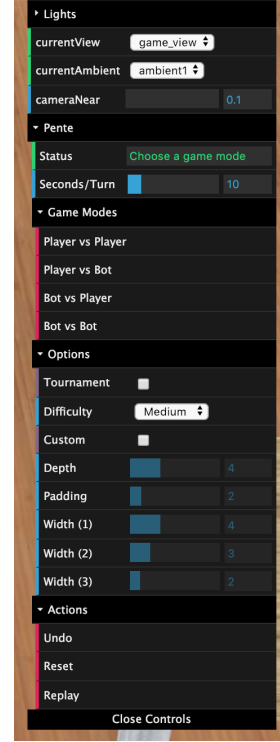


Fig. 2. Game and Scene Interface

To start a game just select one of the game modes from the interface menu. When a place from the board is selected, if it's a valid position, one piece from the pile from who is currently playing goes animatedly to the board. When pieces are captured they are placed in front of the game clock in their respective side.

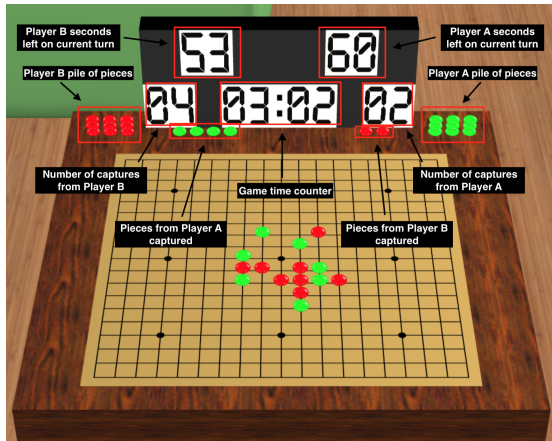


Fig. 3. Board components explanation

4 Bot Settings

- **Depth:** Depth of the bot's search tree.
- **Padding:** Padding of the active sub board used by the search tree. The bot only goes N intersections away from the vertical and horizontal limits (top limit - up-most piece, bot limit - lower piece, left limit - left-most piece, right limit - right-most piece).
- **Width (i)**, i in $\{1,2,3\}$: For each search node on depth i recurse the search tree only for the W_i best moves. If the width is not defined for all the depths, the last width in the list will be used repeatedly.

The higher the difficulty the more time the bot will take. Take that in consideration when choosing the turn time.

Advisable Configurations:

- Easy with 10 seconds per turn.
- Medium with 20 seconds per turn.