FUSE - User's Manual

1. Setup

To run our game you need to start 2 servers:

1. A SWI Prolog server, with whom the application will communicate in order to request information about the game logic. To start it, you must consult *main.pl*, located in the root of the project, using SWI Prolog, and run "server.", with the dot included.
2. A HTTP server on the root of the project, where *main.js* is located, to open the application itself. You can easily do this by navigating to the project directory in the console and running `python -m http.server 8080`, assuming you have python installed on your machine. After that, go to your browser and navigate to http://localhost:8080/proj/.

Since the application performs requests to the SWI Prolog server, do make sure that it is open when trying to play the game. If you are in doubt whether you opened them in the correct order, just refresh the page using Shift + F5, ignoring anything that is cached in the browser.

2. Game Main Rules

During a game of FUSE, both players alternately introduce pieces inside the table, where they will eventually shove other pieces in their way in order to build the biggest group of their color. A group of pieces in FUSE is the collection of all pieces adjacent to each other, both horizontally and vertically.

2.2.1 Board Generation

Given the size of the board chosen by the user in the game's Main Menu, a board with the same number of pieces for both players is built, randomly spreaded on the outer area of the board. These pieces must follow a relevant rule in order to make the game as fair as possible: there can't be more than two pieces of the same color placed adjacently.

2.2.2 Game Development

The game always begins with the player that has chosen the white pieces, moving alternately a new piece to the inner area of the board. The players must always move move a disc inside the board, unless they have no possible moves or run out of time to make it happen, thus forcing them to pass their turn. These pieces can move along the row or column they started from without any boundaries, consequently pushing the pieces in front of them. Any piece already in play, must always stay inside the inner area of the board.

2.2.3 End Game

A game of FUSE ends whenever both players run out of pieces to moves towards inner area of the board. It is then determined the winner of the game by calculating the player with the biggest group of pieces adjacently together.

3. User Instructions

When the application starts, you are presented with a menu where you can select which type of game you want to play: player vs player, player vs CPU, CPU vs player or CPU vs CPU. If any of the players happen to be a CPU, you will also be prompted to choose from 5 different levels of difficulty. You can also select from a dropdown the start game environment in which you wish to play, only affecting the design, never the gameplay. Additionally, on the top right corner of the screen, there is a GUI where you can select the number of rows and columns of the board, as well as the time players may take to perform each move. When you click Play, the game starts using the specified options.

In order to prevent lagging at the start of the game when the scene is being loaded for the first time, there is a delay of 5 seconds. After that, the pieces jump from their auxiliary boards to the main board and the game starts once they land.

As a human player, to play you must first select the piece you want to move by clicking on it. After that, if it is a valid piece and can be moved, the various options of movement for it will be highlighted in the board. You can then select one of them and the piece will move to the desired destination. The turn will then change to the next player. The CPU will choose the movements by itself without any of your interaction.

In this play screen, there is a display on the top left border of the screen. There can be seen: the current player, *White* (player 1) or *Black* (player 2); the score for each player, that is, the highest number of connected pieces in the board; the time remaining for the current player to finish its move.

On the top right of the screen, there is also a GUI, with the following options: Undo last move, which, when clicked, will undo the last move of a human player, correctly switching to the previous state; Scene View, a drop down which allows you to select the current View camera; Selected Ambient, which allows you to select the surrounding environment, also changing the board and pieces' geometry and textures; toggles for each of the available lights on the scene, which may be on or off.

Additionally, when the game ends, 2 other options appear in the GUI: Replay moves, which will automatically replay the moves of the previous game in the order they were performed, effectively showing a "movie" of the game; Restart game, which will take you back to the menu screen in order to play again.

Since the focus of the application is the game itself, the user interaction in the scene, such as zoom, pan and rotation, were disabled. Instead, we defined for each ambient a predetermined set of Views to cover the various angles.