TETRIS: User Manual

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INTRODUCTION

Our project is a spinoff of the classic Tetris experience that integrates traditional arcade mechanics with flashy, polished graphics and a remixed soundtrack. For decades, people have enjoyed the range of playstyles offered by Tetris that offer a gaming niche for everyone--from the most competitive, strategic players rushing to rack up points to the players seeking a more casual, therapeutic experience by "creating order out of chaos."

The well-known and colorful groups of tiles (or Tetriminos) have been a staple of many childhoods. Recreating our own version of Tetris offered three important benefits: paying tribute to a beloved arcade classic, flexing our muscles as programmers learning to apply good software design principles, and revealing a final product that was not only fun for us to play, but also enticed us to proudly share our game with friends.

There are two main themes that comprise the distribution of effort put into our Tetris project: interface and mechanics. Launching the game presents a main menu with a tight, intuitive graphical user interface (GUI) from which various options are presented via buttons that are highlighted when the user's cursor hovers over them (the most important of which is the "Play" button!) Other interface elements encompass the overall smoothness of the game's "feel," including professional-grade images for the Tetriminos, crisp backgrounds, music, and so on. The mechanics encompass the core features that make this a "Tetris" game; primarily, the ways to manipulate blocks by moving, rotating, and dropping them within the gameboard.

In general, Tetris is a game that can be described as deceptively simple in theory--and, arguably, even simpler in practice! Its defining characteristic, however, is the feeling of accomplishment that can only be earned by clearing four rows of blocks at once, completing the eponymous "Tetris."

BACKGROUND/MOTIVATION

Tetris is a puzzle video game first released on June 6, 1984 for the Commodore 64 and developed for countless platforms since then, including the modern XBox One and PlayStation 4 [1]. The game's motivation is to stack groups of Tetriminos (aptly named for the tetra, or four, blocks that comprise each shape) in complete rows in order to clear lines and earn points. On a deeper level, the game has been used in academic research (mostly in the field of cognitive psychology, but also in the theory of computation and algorithmic theory) to measure multitasking and resource management skills.

The most important elements of the game are undoubtedly the Tetriminos, which fit into a "gameboard" (traditionally 10 x 20 cells). Once a row is entirely filled, the line is "cleared," meaning the blocks are deleted and the score increases. If the player is unable to clear lines efficiently and blocks reach the top of the screen, the game is over. The game's difficulty scales with number of lines cleared (essentially, difficulty means the timer event in milliseconds between the Tetrimino dropping by 1 unit on the board decreases).

USE-CASE DIAGRAM
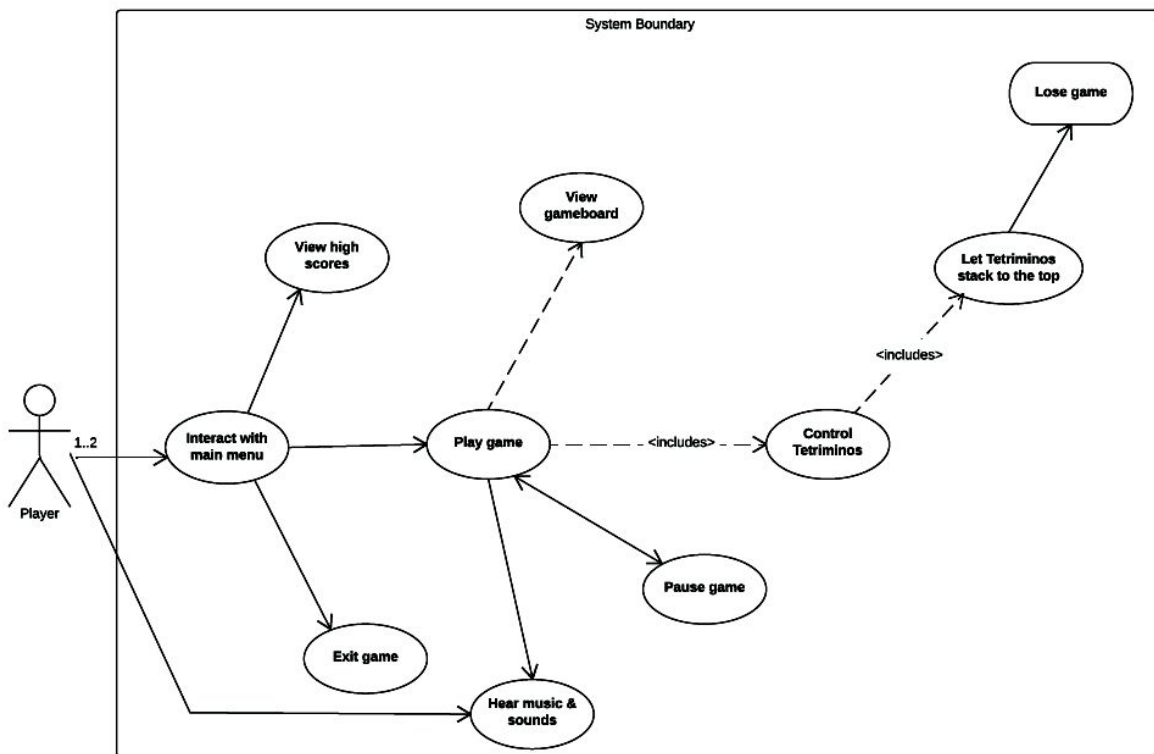
The sole participant in our system is the Player. As outlined in the Use Case Diagram, the Player is able to see and interact with the main menu as soon as they launch the game, as well as hear music. From here, the menu branches off into three selections; the Player can choose to either view the high scores (ranked as a leaderboard), play the game (i.e. begin a new game of Tetris if they haven't already, or resume an ongoing game if they've paused it), or exit the game (which simply closes the window).

Upon entering the high scores screen, no other option is available the user other than clicking the "return" button to return to the main menu. Some pre-generated high scores are available, but the player is encouraged to earn enough points of their own to make the leaderboards or even become #1 in the list.

When playing the game, the user can perform various maneuvers with the Tetriminos. Clearly, they must be able to move them left and right to position them appropriately on the gameboard. Other controls include rotating the Tetrimino (clockwise only), performing a soft drop (the Tetrimino will fall faster as well as generate 1 point per row), performing a hard drop (the Tetrimino instantly drops as far as it will go, earning a lucrative 2 points per row that it falls), and holding the Tetrimino (swapping it for the next Tetrimino in the queue so that it can be used at a more convenient time).

Note that when a Tetrimino is swapped, the new Tetrimino will spawn at the top of the screen. The Player cannot hold a Tetrimino again until they've placed the current Tetrimino (to prevent infinite swapping without the Tetrimino ever reaching the bottom).

INSTRUCTIONS

Command	Control
Move Tetrimino Left	LEFT ARROW KEY
Move Tetrimino Right	RIGHT ARROW KEY
Rotate Tetrimino	UP ARROW KEY
Soft Drop	DOWN ARROW KEY
Hard Drop	SPACE
Pause	ESCAPE
Hold Tetrimino	LEFT CONTROL

SCREENSHOTS
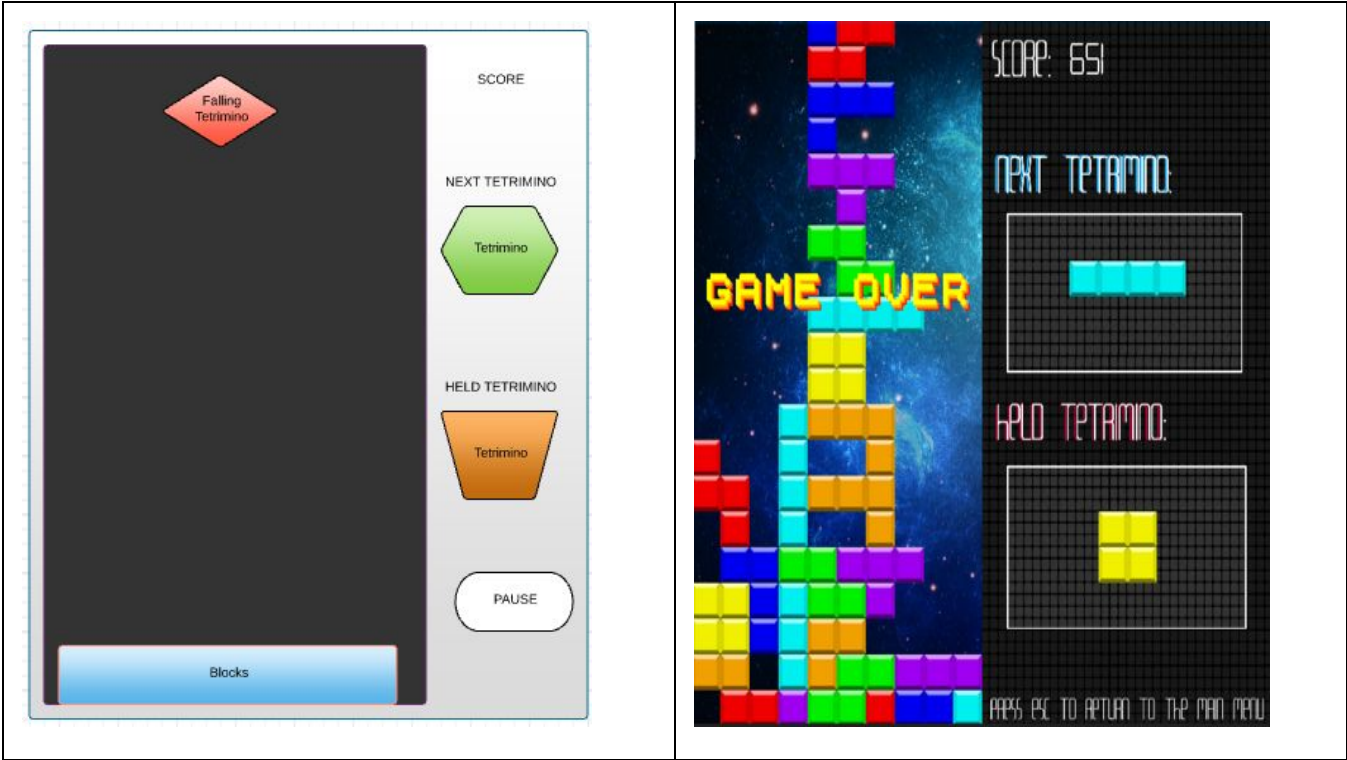
The leftmost screenshot was a rough prototype for our preliminary design phase, where we more or less adhered to the Traditional Tetris layout. The final product (shown on the right) features a polished version of this interface without the Pause button on the lower right.

CITATIONS

(1) https://en.wikipedia.org/wiki/Tetris