

Improv Tetris

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Abstract

The game of Tetris has entertained people for ages. The classic implementation features randomly-picked falling blocks that the user must orient and piece together like a jig-saw puzzle to complete and clear as many contiguous rows of blocks on the bottom as fast as possible before everything piles up above the top. Given the recent popularity of real-time gesture-input-based games like the Wii and Kinect, we want to convert this timeless classic to receive gesture-input from the user via a simple camera. In this version, users can specify the shape of the falling block by contorting their bodies to the desired shape and watch their custom-pieces fall into place and line up in contiguous rows.

We will use an NTSC video camera as the input device instead of a more traditional game controller with a directional-pad and buttons. This video input will be analyzed to determine where the person is standing and what shape his body is making - the shape is quantized to fill a 5x5 grid which forms the falling block. This grid is fed into the Tetris logic FSM which updates the playing field to make the block fall, determines when the block has settled, and clears rows when they are completely filled. The FSM outputs a playing field grid which can be rendered by a VGA module along with the player's score.

Bonus features, depending on available time, may include sound/animation effects , two-player support, and more challenging levels/variations including but not limited to:

1. Users map custom gestures to preexisting shapes
2. Users must match randomly-picked shapes before they can manipulate the orientation and position of the block.
3. User must jump up and down according to the tempo of the music. The tempo speeds up as the blocks pile higher.
4. Power-up shapes to enlarge/shrink their block size, speed up or slow down the game.
5. Jumping blocks, rotating playing board.