Played in 3D

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Inspiration
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Game Logic
Controls, Audio, Visual
Game Input

- DualShock 4 - PlayStation controller
- USB Protocol
- updates every 4ms
DS4 Input Module

DualShock 4 – USB input

Laptop
Create Serial Output

FPGA

Parse Serial Input

Byte Array of button Status

Two, 10 bit variables: Rotation in Y and Z
Display Output

• Score, Next, Level
• 2D display of the game, for debugging - could be a game mode
• XVGA
• Stretch goal - Create a menu for a better User Experience
Early Release Teaser
Sound Output

• Store Tetris theme on DRAM
• Play it on a Loop while the game is in session
• Stretch Goal - Adding sound Effects for dropped blocks
3D Engine
Complications

- Timing
- Data Buffers
- Frame Rates
Timeline

- 11/17 - Full 2D Tetris game working and 3D matrix math modules done
- 11/24 - Controller and audio integration, 3D display works
- 11/24 - 11/26 - Debugging 3D Tetris
- 11/27 - Full 3D Tetris game working
- 12/06 - Stretch goals (user interface, sound effects, challenge modes)
Questions
• Coding going left and right (using tetrmininos, not accelerations)
• Drop speed increases (also with tetrmininos) when down is pressed on the controller.
• Rotation, Several Possible Solutions
  • Or maybe just have a state machine that contains all rotations and switch between the two
  • Maybe have another list for block type to deal with color later on and with rotation stuff
  • Matrix rotation based on tetrmino shape.
Goals

• **11/15** - working 2d game displaying the game board, score, level and next block - integrate with game module
• **11/22** - Controller input is functioning, Adding Sound
• **11/26** - integrate controller and sound with the game,
• **12/06** - Improving display UI (More Retro) integrating stuff and Stretch goals
Edge Detection

• Left/Right
  • Check against solid line on right and left
• Bottom
  • Complex due to unknown shape of placed tetrominos
• Top
• Next block generation
  • Rng module
  • Waiting for the sign to drop the next value
  • Send it to charity
 Parsing USB Input

- USB protocol is very complex and the FPGA
- New plan – Connect controller to my laptop, use ds4drv
- Generate a Serial UART and send to the FPGA
- Process that input