Digital Percussion and Entertainment System

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Overview

A/D → FPGA → D/A
Drum Pads

Practice Drum Pads

Piezo Transducer

Piezo Transducer
Hit Recognition

- Input from Drum pad needs to be assigned an intensity
- There also may be resonance from drum pad
- Assign four bit intensity as highest output from AD670. Wait approx 5-10 ms after assigning intensity to allow for ringing to die out so there is no false hit
Playback

- Convert .wav files of drum sounds to .coe files to load into ROM
- Use matlab functions to convert .wav pcm data to binary coefficients
- Modulate outgoing sound output by incoming intensity
- There will be several kits which the user can select from
Game Logic

• The video game will be a Mario-type game that involves a race
• The character’s velocity will depend on the rate of drumming
• Character will be able to jump
• Will use same timing setup from lab 2
Game Video

- 24 bit rgb
- ZBT RAM as frame buffer
- Will use sprites to draw characters and backgrounds
- Will assign a “z-value” to each sprite to allow for stacking
- Video output will run through video select module
Video Block
Main Controller

- All inputs go through this module
- Start screen
- Has its own memory for character display
- User will select which mode to run system in and hit “enter” to start
Milestones

• Playback Module (11/15)
• Hit Recognition and Drum Input (11/17)
• Video Sprite Design (11/22)
• Game Logic (11/29)
• Game Audio (12/5)
• Main Controller (12/7)
• Kits and Finalization (12/10)
• Second Game (TBD)