Musical Sculpture

A 6.111 Final Project Block Diagram
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Musical Sculpture

• Project Goals:
  – Analyze Hand Movement
  – Create Filter & Apply to Music
  – Output Visualization of Music & Filter
Project Diagram
Input

- Sample
  - Music
    - Up-Sampling
    - Down-Sampling
  - Video
- Store
  - Music
- Analyze
  - Video
Musical & Video Input

- Video Sampling
  - Samples
  - Stores – Video SRAM

- Music Sampling
  - Samples
  - Up Sampling
  - Down Sampling
  - Stores – Music SRAM

- Video Processing
  - Analyzes Pixels
  - Outputs x,y location
Filtering

- Frequency space filtering
- Changing sound effects using variable filters
- Pitch detection & selection
- Filter storage & output to video
- 0 – 10,000Hz
Filtering

- FFT
  - Frequency space
- Amplification & Filtering
  - x, y locations & switch
  - Modifying cutoff frequency of lowpass, highpass, bandpass filters
  - Amplitude modification
- Filter ROM
  - Store filter coefficients
- FFT$^{-1}$
  - Time space
Output

• Display
  • Music
    • Before Filtering
    • After Filtering
  • Filter
• Output Filtered Music
Music & Video Outputs

- **DCM** – generates pixel clock
- **SRAMs** – stored for video output
  - Filtered Music
  - Unfiltered Music
- **Video Controls & Outputs**:
  - Generates:
    - Video Sync Signals
    - Blanking Signal
    - Pixel Values
- **D/A Converters**
  - Music
  - Video