Pianos are large, heavy, and expensive.
Virtual Piano is easy to transport
Visual Gesture Detection

Camera Input

Display Output

Note Processor

TV

Speaker
Visual Gesture Detection

Processes images from camera and sends note name and attack to note processor

- Camera Input
- RGB Convertor
  - video_input
  - rgb_hsv
- RGB to HSV Convertor
  - hsv_value
- Metadata Storage
  - frame_data
  - past_frame_data
- Frame Analyzer
  - frame_difference
- Frame-to-Frame Comparator
- Spatial Difference Analyzer
  - specific_note
  - attack
  - (to note processor)
Writing Music to Bar Staff

C D E F G A B C D ...

\[\text{\includegraphics[width=\textwidth]{music_diagram.png}}\]
Note Processor
receives data from gesture detection module, outputs to display and audio

- **Note Counter**
  - note_name (from Gesture Detection)
  - note_length
  - note_name (to display output)

- **Metronome Timer**
  - labkit_switches
  - metronome_tick_enable

- **Metronome**
  - metronome_tick_enable
  - note_length

- **Sound Transformer**
  - raw_piano_sound

- **Compact Flash Card**
  - address

- **Audio Controller**
  - note_sound
  - metronome_sound
  - audio (to ac97)
Display Output

Receives note length and note name and displays them on screen
Schedule

• Week of 11/11
  – Work on gesture detection – be able to detect 2 fingers
  – Be able to store and play audio
• Week of 11/18
  – Debug display module
  – Work on note processing
• Week of 11/25
  – Debugging, combining modules, implementing stretch goals
• Week of 12/2
  – Debugging!