Virtual Theremin

UIE Project 2015

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The Theremin

Features

For each hand, we extracted the following:

- Palm position (x, y, z)
- Pinch gesture (p_0, p_1, p_2, p_3)
- Open/closed hand ($\alpha \in [0 \ldots 1]$)

Pinch Gestures

TODO: How it's done

Open / Closed Hand

TODO: How it's done

The Basic Theremin

- `leftHand.y` $\rightarrow$ Amplitude/Volume
- `rightHand.z` $\rightarrow$ frequency

$\rightarrow$ A playable instrument.

Findings

- Precision of Leap Sensor is limited. E.g. it's not possible to accurately play a vibrato.
- Linear frequency mapping is easier to play.
- Leap has difficulties with tracking fingers under the hand palm.

Improvements Of The Instrument

For the right hand:

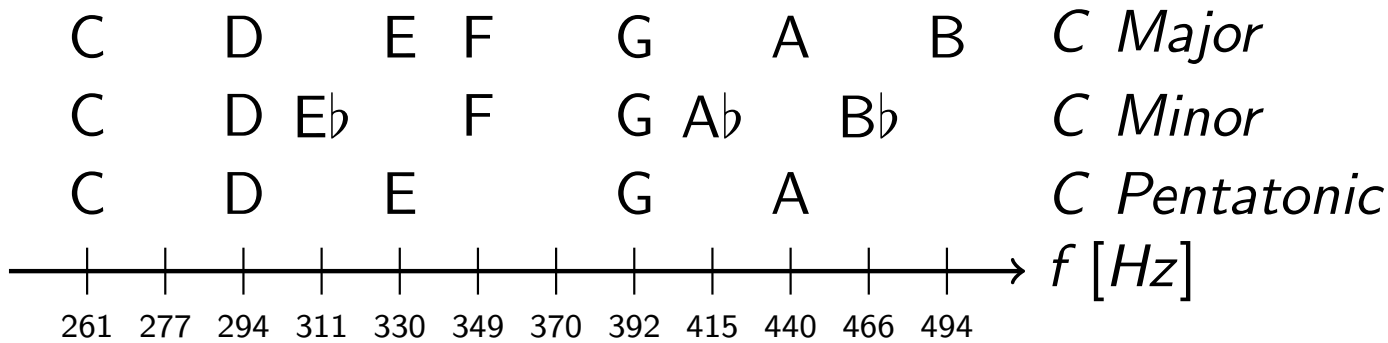
- Pinch gestures (p_0, p_1, p_2, p_3) control different waveforms (sinus, triangle, sawtooth and square).
- Open/closed hand (α) controlls the intensity of a vibrato.

For the left hand:

- Pinch gestures activate frequency discretization (playing aid).
- Open/closed hand controls the intensity of a tremolo effect (Amplitude Modulation).

Frequency Discretization - Music Scale

Rounding frequency to a musical scale (chromatic, diatonic like major or minor, pentatonic).



Thanks for your attention!