GenegleBot: The Autonomous Accompanist

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Introduction

- GenegleBot plays music on its own but can also "listen" to a melody and try to adapt accordingly.

- It generates it's accompaniments genetically.

Inspiration

- Interest in Music Technology
- Desire for accompaniment without other musicians present
- *Polyphonic Accompaniment Using Genetic Algorithm with Music Theory* by Chien-Hung Liu and Chuan-Kang Ting: A paper about an genetic AI agent that analyses a melody and a harmony for it.

Resources

- Software
    - JACK Audio Connection Kit
    - A queue implementation from a CS450 project
    - Ardour (Digital Audio Workstation)
- Hardware is Optional
    - All output is through MIDI messages
    - Can be routed to hardware or software synthesizers
    - Input can also come from hardware or software

Methods

- User input is stored in a queue which is used to generate a histogram.
- At certain intervals, GenegleBot genetically generates a histogram of its own based on the most recent measure from the input.
- A measure's fitness is determined by its similarity to the user input.
- 8 times per measure, GenegleBot samples its most fit histogram for a note to output.

$$Fit(\vec{v}) = \sum_{i=1}^{m} \vec{v}_i \vec{y}_i$$

Where y is the user
input queue

Demo

- It's time for GenegleBot to show off its musical prowess.