Project Topic

**Description:**

Our final project in AI would consist of an AI that would be able to write its own simple music. The AI would be fed files in MusicXML format and would be able to write music based on music it has analyzed. It would then output it’s own music in MusicXML format.

**Team Members:**

Eric Nielsen and Þórður Hermannsson.

**Goals:**

Our initial goal would be to make the AI able to write an eight bar melody in 4/4 for piano where it is deciding what notes to use, what key it should be in and what rhythms to use depending on a database of analyzed songs. The AI would be considered successful if it were able to write a semi-coherent melody. We would present its best compositions at the end of the project. If things go very smoothly and we arrive at the stated goal earlier than the due date of the project we will move on to the following goals for the AI:

* Writing harmonies to go with the melody.
* Deciding on the length of the song.
* Deciding what time signature the song should be in.

**Approach and Methodology:**

**Tools**

Our AI will be built with Python and Django and will have a web based user interface.

**Input and Output**

Our AI will accept files in MusicXML format as input because MusicXML is easy to parse. It will also output its own music in MusicXML.

**Music Analysis**

The AI will have a database that will consist of a transition probability matrix showing the probabilities of one note following another. For every song it analyzes, it will find the probabilities of which notes follow other notes in that particular song and add those probabilites to its database. For instance, if the melody fed into the AI had the notes EEFG GFED CCDE EED, we could come up with these probabilites for what note comes after E:

|  |  |
| --- | --- |
| **Note** | **E** |
| E | 0.5 |
| D | 0.3 |
| F | 0.16 |

It would do this for every note in the song and update the probabilites in its database.

Explain how we would analyze rhythm.

**Musical Generation**

Talk about using Markov Chains for the melody and Genetic Algorithms for the rhythm.

**Who Will Work on What:**

Talk about who will work on what part

**Reference Material:**

<http://www.cs.uml.edu/ecg/pub/uploads/AIfall11/SimoneHill.FinalPaper.MarkovMelodyGenerator.pdf>