

**Music Generation using Recurrent Neural Networks**

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**Overview**

Music generation and composition is an interesting problem to test the creative capacity of artificial intelligence. In that, we find that music and mathematics aren’t much different after all. To be able to produce music and for the model to be able to differentiate between melody and noise is a challenge.

Generation of music is similar to text generation, here we train the algorithm to generate the next sequence of notes to form a melody. Here we explore the ability of RNN and LSTM to generate and compose a melody of its own.

**Goals**

The first challenge of this problem is to be able to read the MIDI files and convert it in a form the algorithm can understand.

The model should be able to replicate the melody we feed to it keeping in mind all the key aspects of the music piece. The algorithm must be able to differentiate between melody and noise.

These are some stretch goals we plan to take up if sufficient time is provided:

* Understand patterns of music based on the tempo, beats-Predict the sentiment of the melody/music
* Compose new music based on composers-To be able to understand the style and the type of music of different composers

**Data**

We train the model from the MIDI files available at [Classical Piano Midi Page](http://www.piano-midi.de/).

**Process Outline**

We want the algorithm to be able to replicate the melody fed to it. The process would be as follows:

1. Convert MIDI files into vectorized format, prepare the dataset for sequence generation
2. We train the model using LSTM and RNN and analyze the quality of melody generated keeping in mind some key aspects like:
3. Key-Signature
4. Time signature

**Milestones**

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| **Timeframe** | **Deliverables** |
| Day 1-4 | Preprocessing and Data Wrangling-Get MIDI and clear out white noise, vectorize |
| Day 5-7 | Build model and improve on the quality of the melody generated-Replicate the melody being fed |
| Day 8-10 | Catch up on backlogs or try to generate new melody from the trained model |
| Day 11-13 | Report and Presentation |