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AI Music Generation

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Project Description

The goal of the project is to create a program that generates music (in the form of a MIDI file) that is stylistically similar to the music created by Johann Sebastian Bach. This will be achieved by training an LSTM Neural Network on Bach's music. Initially, the goal will be to generate just the melody rather than a full piece.

Proposed Tasks

- Design a Neural Network (what information needs to be taken as an input, what information needs to be output, the topology of the hidden layers, etc.) that should be able to imitate the style of Johann Sebastian Bach. This is the most important part of the project and it will require a lot of research.
- Learn how to implement aforementioned design using DL4J library.
- Learn how to extract needed information from MIDI files, and how to encode the output into a new MIDI file.

Project Deliverables

- Program that uses a Neural Network to generate music.
- Example MIDI files showcasing the progress made at different stages of training the network.
- Program that converts the output made by the Neural Network into a MIDI file.
- Program that exctracts information from a MIDI file to be used as input for training the Neural Network.
- Documentation explaining the design of all aforementioned programs (and how this design was implemented).
- Final report that will discuss all of the work done, draw conclusions from the results and acknowledge all of the 3rd party resources that were used for this project.

Initial Annotated Bibliography

[1] Composing music with RNNs

An article on generating music using RNNs. It is a good starting point for conducting research on this subject.

[2] Deep Learning 4J

An open source Java library for deep-learning.

[3] Deep Learning Techniques for Music Generation -- A Survey

An analysis on different ways of using deep learning to generate musical content.

[4] “Lisl’s Stis”: Recurrent Neural Networks for Folk Music Generation

A project with an objective very similar to this project's objective.