

CSE 190 Final Project

Summer 2020

Prompt

Given a collection of MIDI or audio files of a single genre, can you create a model which generates music similar to the genre?

This project is meant to allow you to explore generative models in music, learn something new, and create a cool composition! Please feel free to work with data and models that you find interesting, fun, and manageable to your level of familiarity with machine learning.

Your project will be composed of three components: a proposal, a presentation, and a report. During the last week of class, we will enjoy each others' creations, perhaps listening to the next Super Mario melody, Beatles track, or Beethoven's 10th Symphony.

You may work independently or in groups of up to 4 students. It is ok to make use of standard libraries, implementations, and other published resources, but please be clear when crediting others' work in your citations.

Rubric

Proposal & Discussion: 5%

Presentation: 70%

Report: 25%

Proposal

By 7/21 11:59 PM, please submit a project proposal to Gradescope that includes the following:

- A list of group members
- Selected Genre
- Data Source
 - Where will you find your MIDI or audio files?
 - What qualities will your sound files have? (i.e. Monophonic/Polyphonic, Single/Multiple Instrument, etc.)
- How you propose to represent the music as input to your training network
 - This should include discussion on which musical elements will be included, and which may be left out. For example, will your network work only with melodic sequences, rhythms, or both? Will it make use of harmony or multiple instruments?
- What network architecture you will use (e.g. LSTM, GAN, RNN, HMM, Other)
- If your network architecture is based on a research paper, please include a reference section.

Presentation

Presentations will be given in class 7/28-7/30. Presentations should provide a summary of the project, the model, and the results. Duration is limited to 15min + 5min questions. Can be done as powerpoint, live demo or a combination of both.

Please be prepared to present as a group during your scheduled time. Presentation times have been randomly assigned and listed on Piazza. If your group would like to volunteer to present at an **earlier** date/time, you are more than welcome to do so, just let me know via email (regreer@ucsd.edu). Following presentations will be shifted to later times.

By 7/30 9:30 AM, please submit a PDF of your slides to Gradescope. Your presentation should include:

- Overview of your process
 - Essentially a recap of your project proposal, along with any changes made or challenges along the way.
 - Cite any libraries, implementations, or references used.
- Visualization of model architecture
- Output demonstrations:
 - Two side-by-side examples of similarity:
 - Audio and/or visual demonstrating a few seconds that are very similar to examples from training data. Please include both your network output and the similar training data so we can clearly see and/or hear the similarity.
 - Two examples of dissimilarity
 - Audio and/or visual demonstrating a few seconds that are very dissimilar to the training data (or are complete noise).
 - One complete (and creatively-titled) audio track, at least 30 seconds in length, using output generated by your model.

Report

By 8/2 11:59 PM, please submit a PDF of your final report to Gradescope. Your final report should be written in a NeurIPs style, as follows:

Formatting instructions:

All reports must be in PDF format, 4-6 content pages, including all figures and tables; additional pages containing supplementary materials and references are allowed. You must format your submission using the [NeurIPS 2020 LaTeX style file](#).

Suggested Content:

- Introduction
- Background
- Related Works
- Architecture
- Experiments
- Results
- Conclusion

Code and Results:

You must provide a link to the code on Github and to audio-visual results. The links could be put as footnotes and in supplementary materials. Media files can be placed in a folder on Github or provided as a link to a media streaming service (YouTube video, Soundcloud audio). Midi files should be available for download and also rendered into mp3.