

Music Generation with Deep Learning

- **Generative Adversarial Network (GAN)**
 - A type of deep learning network where two separate models work against one another to improve and learn
- Implemented [Olof Mogren's C-RNN-GAN](#)
 - Much of the work done was updating the code base to work with more recent versions of Python and TensorFlow
 - Sample output from the paper: [sample11.mp3](#) [sample09.mp3](#)
- **My Work**
 - Using 3,414 MIDI files of works by classical composers (Tchaikovsky, Debussy, Rachmaninoff, etc.), I trained the model multiple times using different hyperparameters.
 - Also utilized the Nottingham Dataset

Results

- Small model trained on ~1600 classical midi files, one tone per cell, 6 epochs
 - Repeatedly plays the same/similar notes in rapid succession
 - Small model has trouble generalizing
- Large model, 115 epochs, up to 3 tones per cell
 - Outputs seem more 'creative' with a larger octave range, little rhythm to speak of
- Large model, larger discriminator (500 hidden units, 3 LSTM layers), 30 epochs, up to 3 tones per cell
 - Did not have sufficient time to fully train this model--the larger discriminator nearly doubles training time