Using Neural Networks to generate Irish Music: A Background

Notable Existing Works

Neural Irish Tunes (link):

The author used Recurrent Neural Networks (Torch-RNN: https://github.com/jcjohnson/torch-rnn) to generate Irish music. He/She used the session database. All songs were transposed to the same scale (D). Used 3 parameters as variables neural network size, dropout, number of layers). Once files were generated through RNN, all tunes were played and best ones collected and cleaned.

Results: The Bat in the Hat; https://www.youtube.com/channel/UCpCoBeBNjQOvOnwzJZu2jGw

More information: http://irishabc.com/technical/

Folk-RNN (link):

Folk-rnn is a project funded by the UK Arts and Humanities Research Council. Iryna Korshunova, Oded Ben-Tal and Bob Sturm have used LSTM based RNN as well (found here: https://github.com/IraKorshunova/folk-rnn). They have primarily used data from The Sessions, and have a website where you can generate a folk tune with an rnn (https://folkrnn.org/).

They have written multiple papers on this, and have been featured in many news articles. (all found here https://github.com/IraKorshunova/folk-rnn)

They explain more about the ABC notation and how to get started on generating music and transposing it here: https://folkrnn.org/)

Results: http://www.eecs.qmul.ac.uk/~sturm/research/RNNIrishTrad/index.html

More Information: https://github.com/IraKorshunova/folk-rnn

Music Generation with Deep Learning (link):

Atul Acharya used the same LSTM based RNN Generator as the author from AI Weirdness. He scraped songs from O'Neill's Irish Music dataset (source), Cobb's Irish Music dataset (source), Nottingham Music dataset (source) and Bob Dylan Songs (source)

He used python and tensor flow.

Results: https://www.youtube.com/watch?v=WsdJ6LP6f-E&feature=youtu.be

More Information: https://github.com/laventura/Music.Generation.with.DeepLearning

Notable Sources for Research

Andrej Karpathy (link):

Andrej is the Director of AI at Tesla. He was previously a Research Scientist at OpenAI. His focus is on Deep Learning, with applications in Computer Vision, Natural Language Processing, and their intersection.

He has a ridiculously good blog post on rnn effectiveness with many practical applications: http://karpathy.github.io/2015/05/21/rnn-effectiveness/

Most of the works above have used his model of LSTM based RNN to generate music. His GitHub has many interesting neural networks (using python and even Javascript!)

More Information: https://github.com/karpathy/char-rnn

AI Weirdness (link):

Janelle Shane used a Char-Multi-layer Recurrent Neural Network based Generator (found here: https://github.com/karpathy/char-rnn) to generate names for Irish Music tunes.

More Information: http://aiweirdness.com/post/159062141927/irish-tune-names-invented-by-neural-network

Music Composition using recurrent Neural Networks (link):

Nipun Agarwala, Yuki Inoue and Axel Sly have published a paper on music composition. Interestingly, they mentioned that they have tried GANs, but failed to produce meaningful results due to “instable training”. They have used the same ABC music notation and encoding scheme. The types of Neural Networks used were: **Continuous Bag-Of-Words**, **Character RNN**, **Sequence-to-Sequence**, and **Generative Adversarial Networks**. They found Sequence-to-Sequence generated the best music in their case. They failed in training GANs well and mentioned they would like to fix their GAN model in the future and try out MusicXML dataset.

More Information: https://github.com/yinoue93/CS224N_proj