

AI Music Authorship: Ethical Topics and Resources

Availability of Data

Certain types of musical data are more readily accessible to be used to train ML models. (Public Domain Classical Music that has been converted into MIDI, an easy format for ML models to process)

Issues/Things to consider:

- This creates more ML musical output based on a certain type of music which can skew the perception of what types of music can be made with ML.
- The musical output made by these models will possess certain musical characteristics specific to this type of music. If used by artists who use this output for influence or collaboration, their music will automatically be influenced by this as well.

Resources:

[Bach Google Doodle](#) - Provide 4 part harmony in the style of Bach to a melody you write

[Coucou](#) - Similar harmonizing AI to Bach Google Doodle but uses different interface (does not require knowledge of musical notation) and allows for more parameter adjustments

[Bach Bot](#) - Tests you on whether or not you can tell the difference between actual Bach music and music composed by AI in the style of Bach

Output Curation

ML models can output a HUGE amount of music. Output examples presented to the real world are often curated to show the machine learning model in a favorable light, meaning people are picking the best sounding musical output.

Issues/Things to consider:

- Curated examples are going to be biased based on the curator's personal preferences as to what qualifies as a "good" example.
- Many people will not be aware of how much output a model can produce, thus giving them an unrealistic perception of what ML generative musical models are capable of. (A lot of the output is not good, or unlistenable)

Resources:

[Magenta Transformer](#): Provides over 100,000 random, uncurated examples from a generative ML model to listen to and are available to download for use in your own musical composition

[Dadabots](#) 24/7 livestream of AI trained on Death Metal - Gives idea of endless output that can be created by ML models

[Infinite Bass Solo](#) Adam Neely discusses using ML to create an infinite output of bass solos with Dadabots

Generating your own data - Other styles

Researcher will choose to create their own dataset in order to train a ML model for a specific task. This may involve having musicians come in and play music to be compiled as data to be used.

Issues/Things to consider:

- Data is going to be biased as a reflection of these particular drummers' personal styles and nuances.
- If musical data is going to be in the style or genre of a certain culture/geographic location, certain stylistic elements may not be captured if the performer is not from that particular culture/location.

Resources:

[GrooVAE](#) - Takes programmed drum patterns and gives them more of a human feel, a 'groove'. Data for project was created by having drummers come in and play on a MIDI drum set and recording the data in MIDI form. Model was then trained on this dataset. These drummers (8 men, 1 woman, all white) were chosen (to some degree) for their ability to play in multiple different styles, therefore offering (in theory) a more diverse data set.

Using Your Own Data

The band YACHT used ML to make an album by converting their entire back catalog into MIDI data, feeding it into a ML model (with the help of some ML experts) and producing a large amount of output. They then curated the output looking for musically interesting ideas and transformed that into songs.

Issues/Thing to think about:

- Access/Privilege: This group had the time and resources to have their entire back catalog converted into an acceptable format for a ML model. They had access to a team of researchers who could assist them in all the technical processes of training models on their back catalog. They also had time to then go through all the output to ultimately convert into their music.

Resources:

[Chain Tripping - YACHT](#) - Album made curating ML output.

[Music and Machine Learning: Google I/O 2019](#) - Jesse Engel and Adam Roberts from Magenta project discuss using Machine Learning with music. Claire Evans from YACHT discusses using Machine Learning to create new album. The Flaming Lips using tools made with ML for performance purposes.