Interpolation from Libertango to Under Ppressure - using Google Magenta MusicVAE

My project is online at https://phhu.org/melody-interp/

The source code is availabe at https://phhu.org/melody-interp/

The video presentation is at https://phhu.org/melody-interp/pres.mp4 [still uploading.... please be patient with download]

Screenshot

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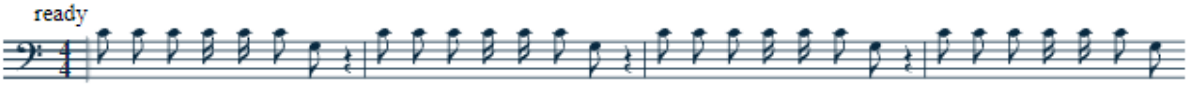
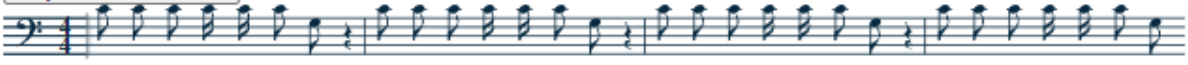
Basic player 1

Re-interpolate

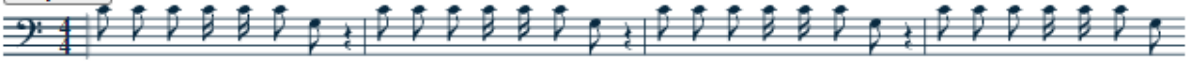
ready



Play Under Pressure riff



Play Int 0



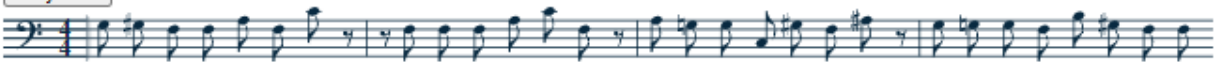
Play Int 1

Play Int 2

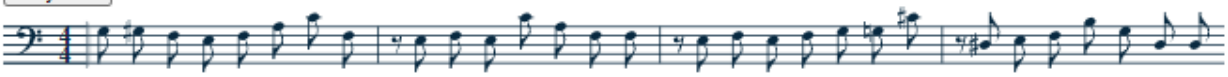
Play Int 3

Play Int 4

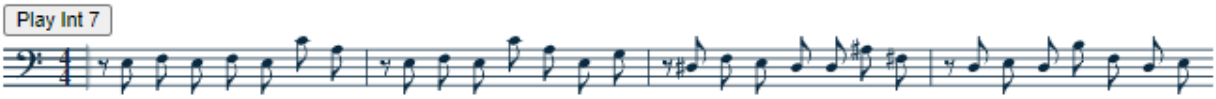
Play Int 5



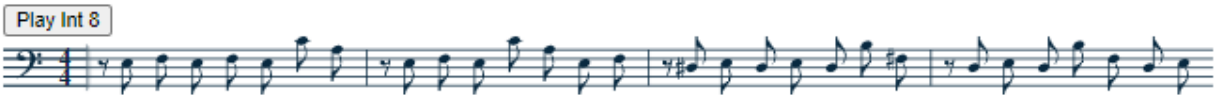
Play Int 6



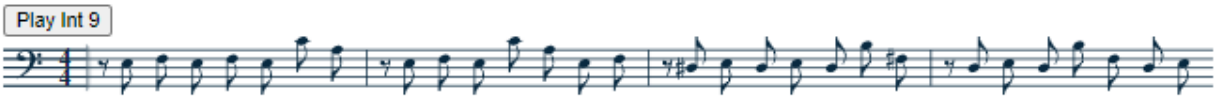
Play Int 7



Play Int 8



Play Int 9



Play Libertango riff

Text

In the my last creation for the Media Theory course, I explored the Google Magenta project (https://magenta.tensorflow.org/), which uses machine learning to create music and to a lesser extent art. My project used AI to recursively generation variations on a given melody, based on user choice and musical input (see https://phhu.org/melody-conv/). Other Magenta projects explore the idea of exploring musical

interpolated between given melodies or rhythms, such as "Beat Blender" (https://experiments.withgoogle.com/ai/beat-blender/view) and "Melody Mixer" (https://experiments.withgoogle.com/ai/melody-mixer/view/).

Based on this, I have created a project which explores the unclear boundary between two copyrighted and recognisable melodies, using a format similar to "Melody Mixer". My project takes two four bar musical phrases, the famous bass riff from the Queen song "Under pressure", which was subject to a legal case when rap artist Vanilla Ice sampled it in his song "Ice ice Baby"; and also the riff from Astor Piazzolla's 1970s composition "Libertango", which is also still under copyright. It then interpolates between them, producing a series of variations which move from one to another progressively, giving novel melodies in the middle which are relatable to both the two which inspired them, but also sufficiently distant from the two that "inspired" them that I doubt a court would consider them to infringe copyright.

Somewhere though, along the (potentially continuous?) gradient between the two though, there must be a point where the interpolated melodies do infringe copyright, because they are only very slightly different, and small differences do not protect against claims for copyright infringement (as was the case in the original appeal court reversal of the Star Athletic vs Varsity Brands case)

The boundary is not clear. Some of the legal questions are explored on the website https://allthemusic.info, which documents Damian Riehl's attempts to release into the public domain all melodies which are not yet subject to copyright, based on a mathematical and algorithmic conception of music. It also details some of the legal questions: the copying must be based on prior knowledge of the song or music copied; the element or melody copied can be as small as a two bar phrase; and the shape melody is what matters, rather than the key. Furthermore he argues that as music can be represented as a MIDI file, which is a common format for representing music in computers, in a similar way to a printed musical score, MIDI files are copyrighted once expressed in fixed form.

In the case of my project, I would argue that the four bar original phrases, and the variations, are published in fixed form because they are published on a website. While in this case they may be covered by fair use (for educational or commentary purposes) because the samples are short (a limitation of development time and processing time), in principle Google Magenta could be used to produce variations between entire copyrighted compositions in the same manner, and in principle these could be marketed.

This issue was famous 209 Perry / Flame law case (descibed and ridiculed by Adam Neely at https://www.youtube.com/watch?v=0ytoUuO-qvg), where Perry was sued successfully for copyright infringement based primarily on a 2 bar ostinato (repeated melody pattern) which was very similar to one used by Flame. This lowered the bar for copyright infringement - but this decision has been reversed on appeal (see https://www.theguardian.com/music/2020/mar/18/katy-perry-wins-appeal-in-28m-plagiarism-case-dark-horse). Thus the legal question of when a copyright holder can claim for infringement based on a short melody is still in flux. Another signficant case in this regard was when George Harrison of the Beatles was found to have "subconciously" copied the song "He's so fine" in his 1971 song "My Sweet Lord", a 1976 case which helped establish precedent.

Another interesting legal question - one which I have not explored - is who would be held responsible for the compositions of an artificial neural network, as used in this project. Should the creator of the network be guilty? The person who used it? Or the network itself?