Deliverable 3

Multiagent Music

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1. N/A

2. Since last submission, I have begun setting up the code from <https://github.com/hexahedria/biaxial-rnn-music-composition> to create LSTM networks to work on midi files, treating them as a single voice. Unfortunately the code assumes the use of GPU processing with Theano which uses CUDA, but I don't have a NVIDIA graphics card, so a good bit of refactoring still needs to be done and this has been a major roadblock, but still better than creating it from scratch. Other than that, I have exported a good number of contemporary songs with guitars and bass to MIDI so that they can work in the LSTM networks.

3. I'm a little behind schedule because I hoped to already have a trained NN for a single voice, but I'm still working on getting it to work. However, I will be able to finish this part in time to do my scheduled tasks for deliverable 4.

4. After analyzing different methods, I think having multiple LSTM neural networks representing different voices and feeding simplified inputs to each other will be the best way to allow for multiple agents. The communication inputs should be simplified like just providing the basic chord so as to avoid overfitting.

5. The level of knowledge provided to each instrument's neural network will be the inputs mentioned in previous deliverables: previous pitch class, neighboring pitch classes, part of the beat, etc. The beliefs about the other instruments will not contain as much information, as to prevent overfitting to certain riffs. Perhaps the instruments will only know what chords or dominating notes the others are playing. The beliefs about other instruments will cause each instrument to alter their course to form a more harmonious piece of music. The knowledge and beliefs will be represented as input/output vectors, as this is all a NN needs.