MP4 Project Proposal

Project Overview:

- We are creating an Interactive Music Visualizer users input an MP3 file into the program which generates a movie with data extracted from the music file. This program will run prior to playing the movie and music at the same time, and will preprocess the audio data to generate the Computational Art equations that will be visualized later on. Then, during the movie (the visualization of these equations), the user is able to manipulate the movie behavior throughout the song by interacting with several keys on the keyboard. These keystrokes will essentially swap colors in the equations but will not involve regenerating equations.
- MVP: Movie with generative imagery, updated based on data extracted from MP3 file. Behavior will be modified by keystrokes.
- Stretch goal: 3D modeled generative imagery, updated based on data from the MP3 file and keystroke entry.

1. Q: Inverse colors
2. W: Black and white (Greyscale) (G = (R+G+B)/3)
3. E: Swap R for B
4. R: Swap B for G
5. T: Swap G for R
6. Y: Randomize colors -- “Crazy mode”

Learning Goals:

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● Working with libraries ● Audio analysis	● **Working with classes** ● Readable code ● Partner programming	● Learn how to merge, commit, and collaborate on Github. ● Learning what types of data can be converted cross artistic medium.

Libraries:

- PyGame

- Python Imaging Library
- MoviePy
- LibXtract
- Aubio

Mid-Project Check-in:

- Completing the controller which includes the user interface that asks for the MP3 file that the user would like to visualize and the program is able to take in keystrokes at a primitive level.
- Visualize pre-analyzed audio data at base level (i.e. matplotlib style with time as x-axis)
    - Pitch
    - Beat
    - Volume
- Record when keystrokes are pressed along with which key was pressed (to later be used to swap colors in our equations)

Risks:

- Data identification (Can we get useful data and then use that data from an MP3 file?)
- Computational power and time
    - We believe we are circumnavigating this by pre-analyzing the song for audio data, then generating the equations, prior to displaying those in real time.
    - The process that will occur in real time looks like this:

Process:

Pre-analysis:

- Audio file is inputted
- Pitch, beat, and volume data is extracted
- Equations for each frame are generated

Live:

- Key is pressed at some point during song
- Key is identified (Q means to invert the colors)
- Colors are identified in equations for the next few frames
- Program inverts the colors for each frame
- Program displays the frames with these new colors