



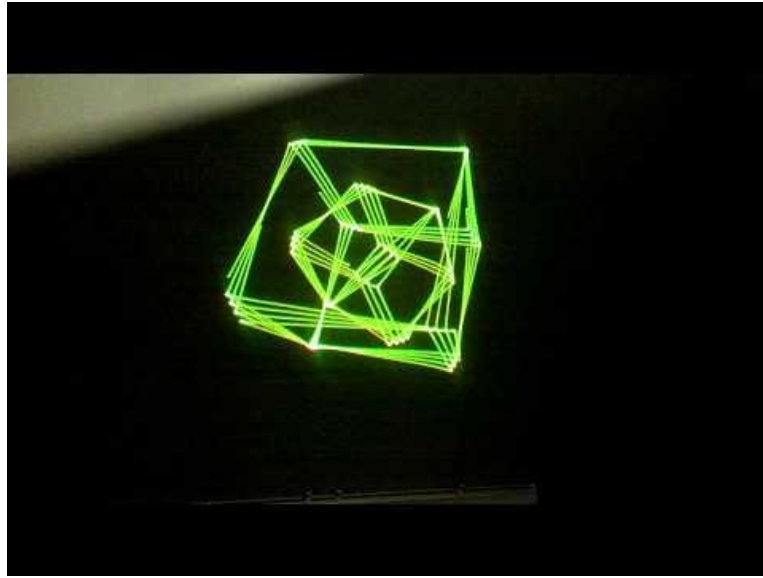
Rave-In-A-Box

6.111 Project Proposal

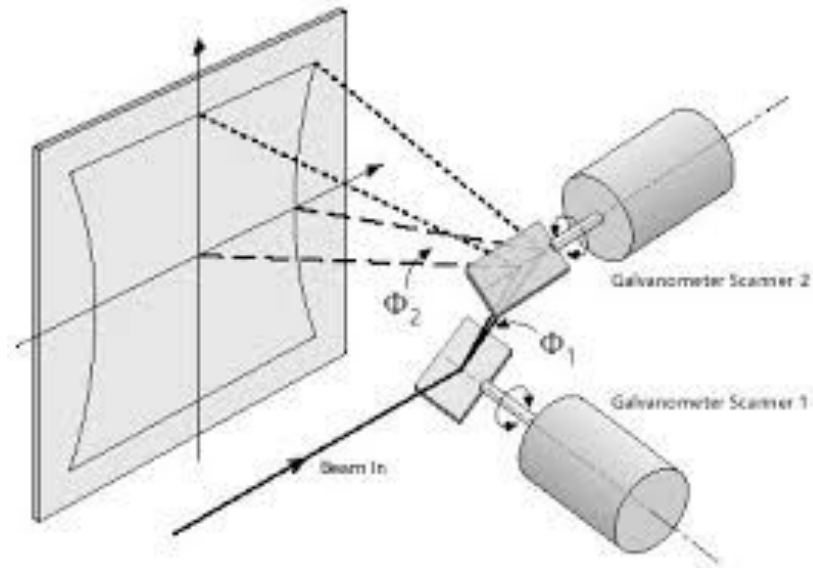
Samuel Cherna, Joshua Gruenstein, Matthew Reeve



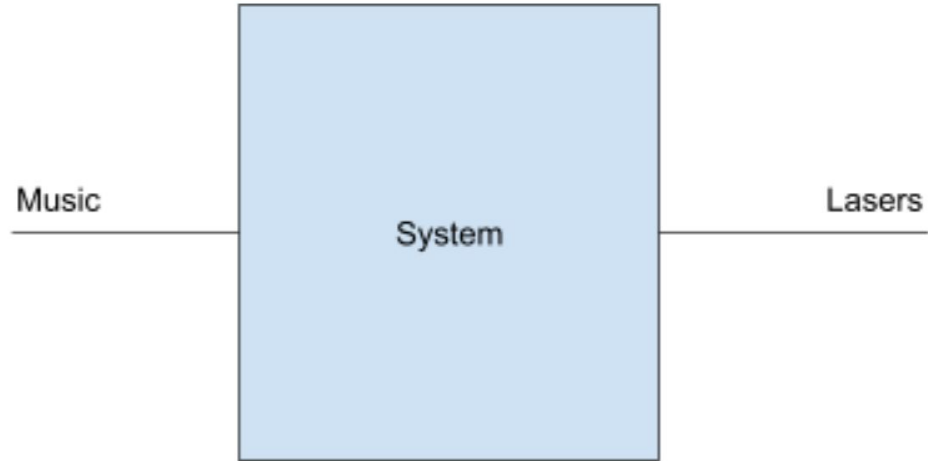
Laser Projection



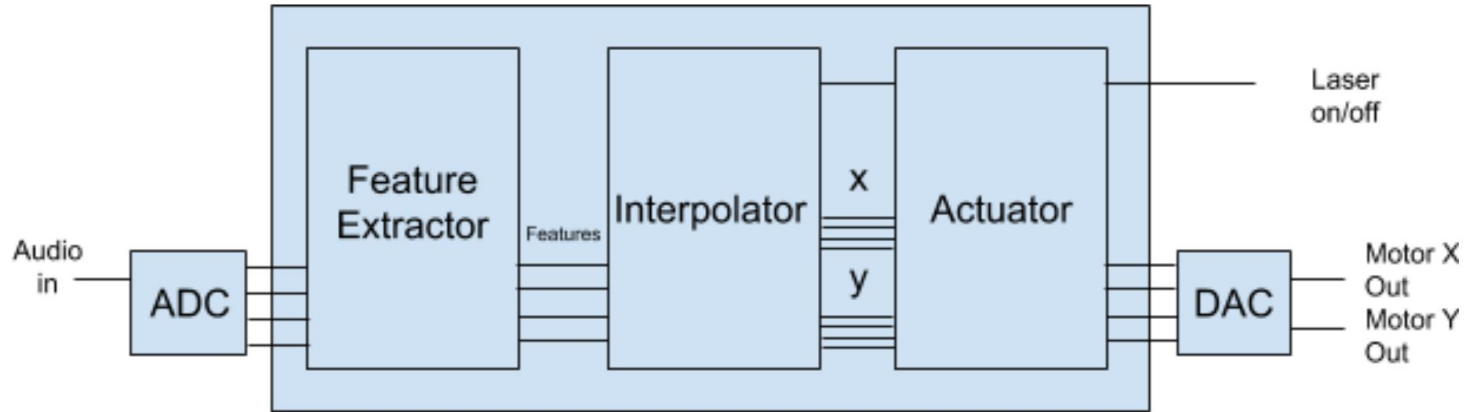
Laser Galvanometers (20k points per second!)



Overview

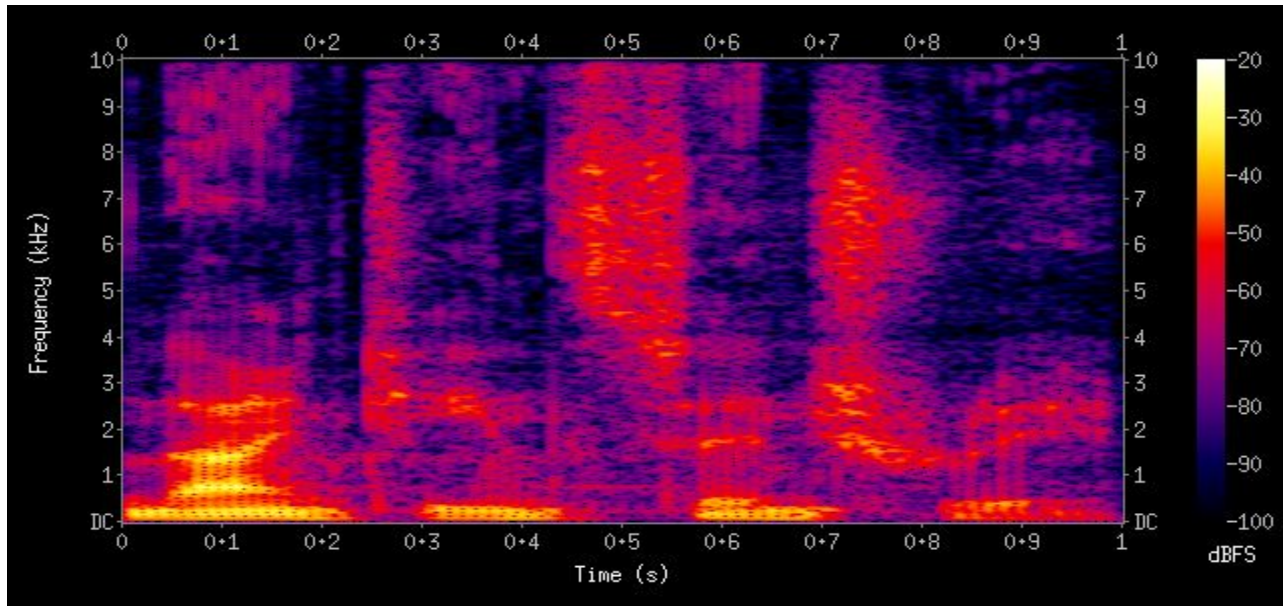


Block Diagram

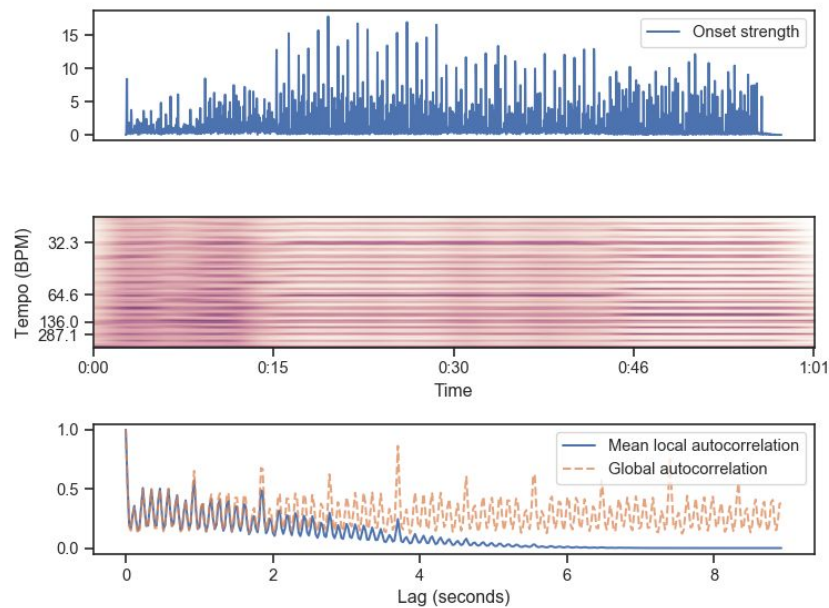
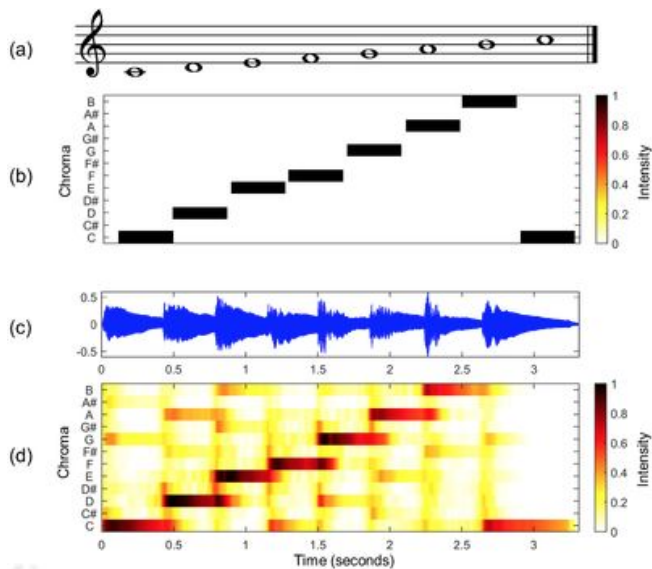


Feature Extractor

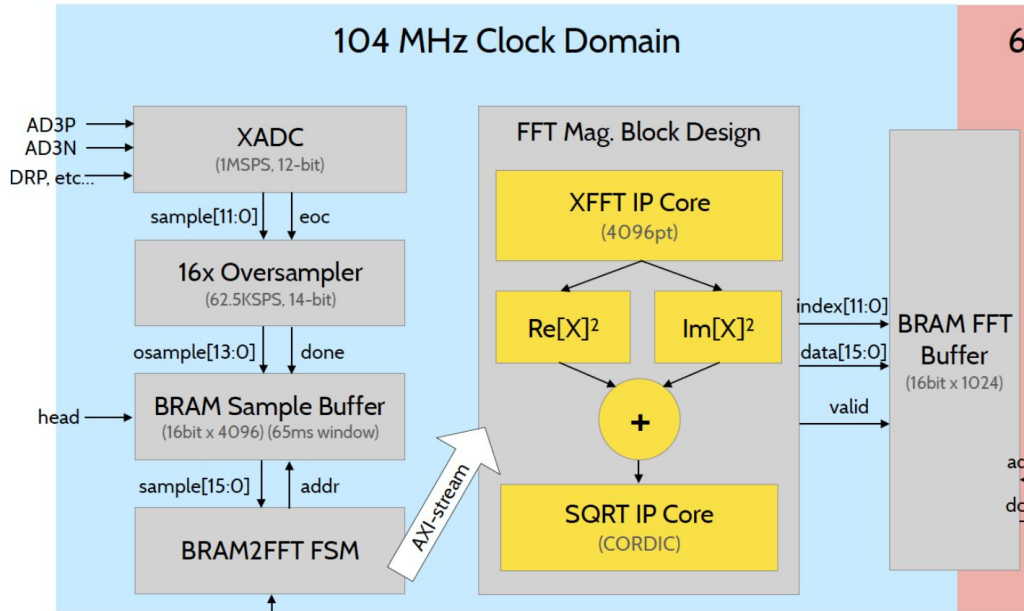
Short-Time Fourier Transform (STFT)



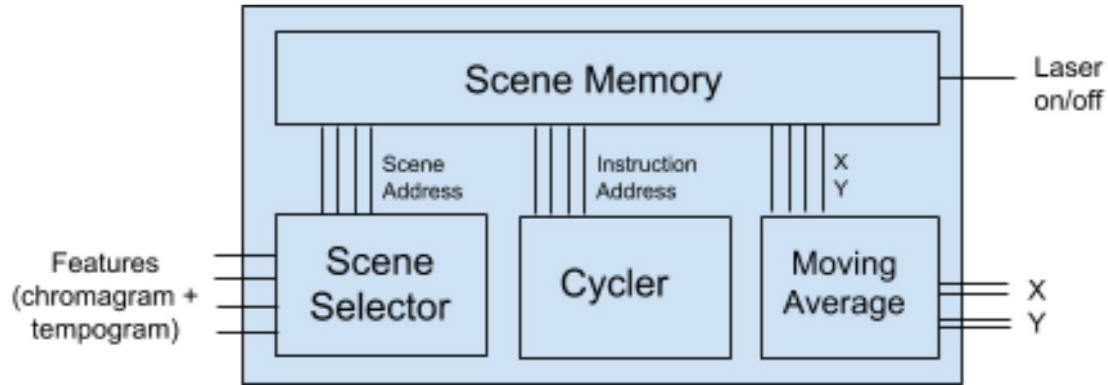
Chromagram and Tempogram



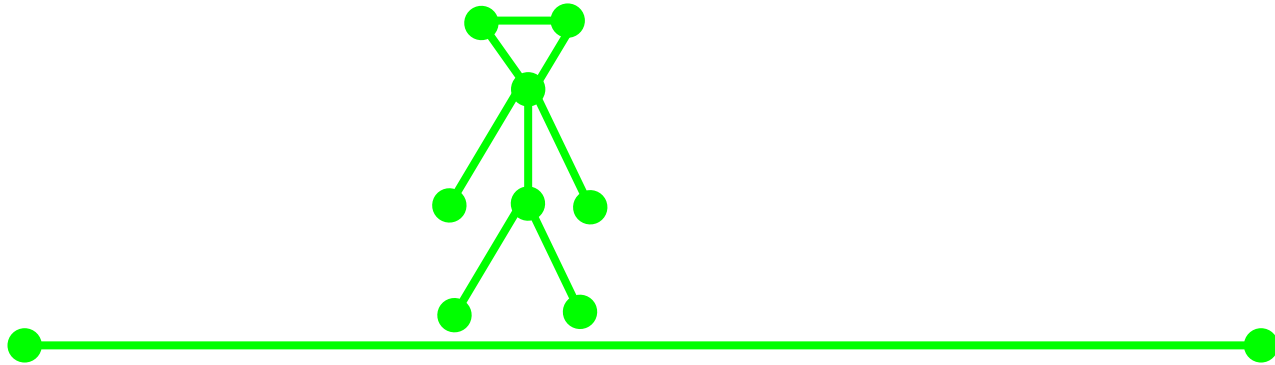
STFT Implementation



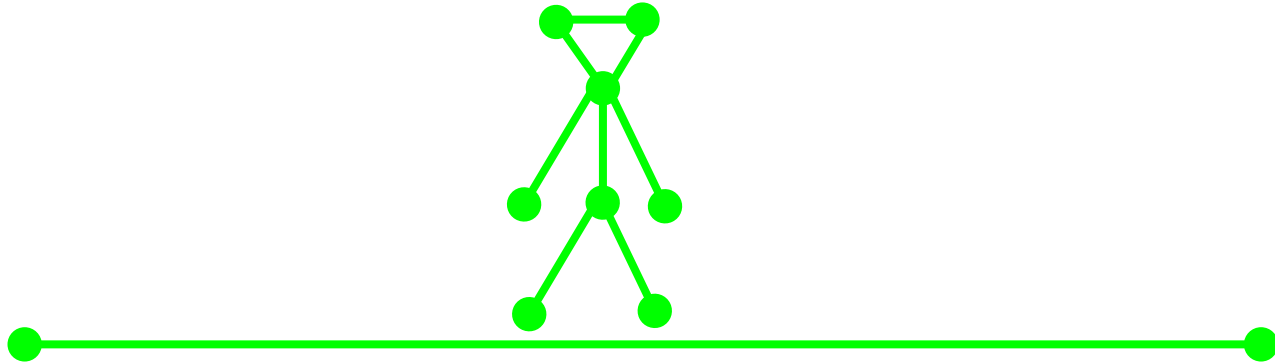
Interpolator Module



Scene Example



Scene Example



Actuator Module

- Analog signals are outputted to both our X and Y mirror control galvanometers using SPI
- Using a MAX525 as our DAC
 - 5 channels (2 being used)
 - Each channel has 12 bits of precision
 - Allows for 4096x4096 projectable points

Mechanical Overview



Timeline

By November 19: Working FFT/spectrogram, memory access for scenes, galvos (test using signal generator)

By November 26: Working chromagram, cycler for scenes, controlling galvos with DAC

By December 3: Working tempogram/beat tracking, interpolator for scenes, SPI control of galvos, box prototype

By December 10: Integration and testing, final Rave-in-a-Box

Stretch Goals

- RGB Lasers!
- More complex FFT! (log compression, low pass filtering, experimenting with hop sizes)
- Using tempo to control cycler speed!
- Smoother transitioning between scenes!
- Hidden Markov Models for chord detection!!!! 🎧🎧🎧
- The possibilities are endless!

thx bye.