**Aim-** To make an auto music generator which randomly plays notes derived from a distribution by various feature groups, one that is learned from a model

**Scope-** model can be anything that learns features of a song- spectral features, instrument classifier, emphasis is on understanding feature extraction part under MIR. Added advantage would be a chance to dive deep into neural networks architecture and a distributed product design

**TL DR;**

Overall, to build a micro applications type of product that takes following inputs on a basic HTML based product from an api:

*Genre: from a preset*

*Inspiration-* Upto max 3 (band/Artists/song)

*Tempo*: Upbeat/laidback

*Preset*: [Rock], [Pink Floyd, Porcupine tree and Yngwie Malmsteen,laidback]

And publishes a live stream on that HTML page with possibly a cool animation.

Take a 5 minute clip:

Sampling 44000 hz, ideally want to predict 4 samples per second: That gives 11000 samples per snippet to learn and generate

tag genre

tag tempo

Tag Band

instruments = [1,2,3…36]

find Instruments

Find mel spectrograph average frequency for song

cutoff below 80% percentile

median of all localized frequency groups

Instrument\_list = [medians of all localized frequency groups]

instrument\_freq = [frequencies of all localized frequency groups]

break in parts based on silenced clipper( tag part 1 2 3.., release constraints to allow limited tags, max 7 (for the floyds))

Time\_since\_song

Time\_since\_clip

break each part in beats based on hyperlocal bpm

Time since beat

for each beat find spectrograph (mel)

cutoff below 85% percentile

Compare distances [offset] from nearest median instrument\_freq

Assign instrument

for each instrument:

instrument\_y = y[instrument]

[instrument\_y\_frequency] = find sinewave freq

[instrument\_y\_amplitude] = instrument\_list.i

[timbre] = timbre

[zcr] = zcr

[rolloff]

[spec\_cent]

[spec\_bw]

[onset\_envelope]

[onset\_strength]

[tempo]

[offset]

Output: Next Y

file save\_features Target: Instrument [i].p

sinewave\_frequency

sinewave amplitude

Groupby tag genre

tag tempo

Tag Band

instruments = [1,2,3…36]

timbre

zcr

rolloff

spec\_cent

spec\_bw

onset\_envelope

onset\_strength

tempo

offset

variateby Time\_since\_song

Time\_since\_clip

Time\_since\_beat

Save model

Predict by tag genre

tag tempo

Tag Band

Predicted groupbys(2d) instruments = [1,2,3…36]

timbre

zcr

rolloff

spec\_cent

spec\_bw

onset\_envelope

onset\_strength

tempo

offset

Incrementals Time\_since\_song

Time\_since\_clip

Time\_since\_beat

output = Model.predict()

for I in len(36)

instrument = 1

sinewave\_frequency

sinewave amplitude

y = sinewave\_to\_y

audio(y,sr)