

Let Music Roll

HackShanghai

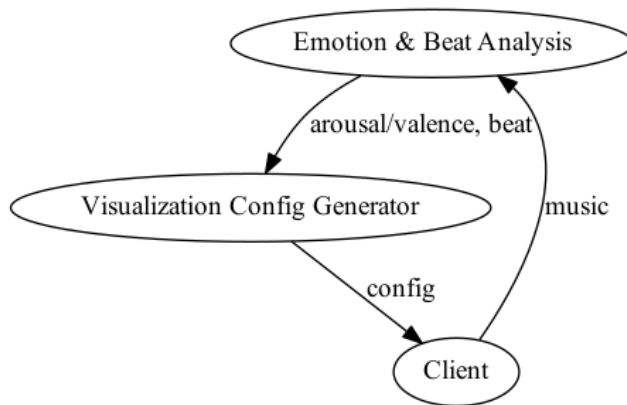
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Project

Music understanding and visualization.



Beat Detection

- ① Separate **percussive** and **harmonic**:
 - ① Short-time Fourier Transform
 - ② Harmonic Percussive Source Separation
 - ③ Inverse Short-time Fourier Transform
- ② Detect exact beats from percussive: local estimation with global regularization

Emotion Detection - Features

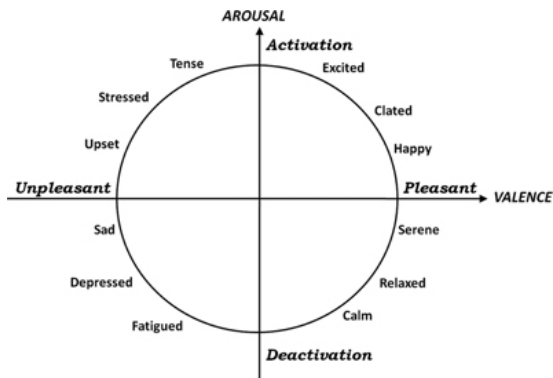
- (a) Root Mean Square
- (b) High Quefrenqcy Log Frequency Spectrum
- (c) Chromagram
- (d) High Quefrenqcy Chomagram
- (e) Mel-frequency Cepstrum
- (f) Low Quefrenqcy Log Frequency Spectrum
- (g) Log Frequency Spectrum
- (h) dbPower
- (i) Low Frequency Power

Emotion Detection - Data & Model

"**Emotion in Music 2014**" public dataset.

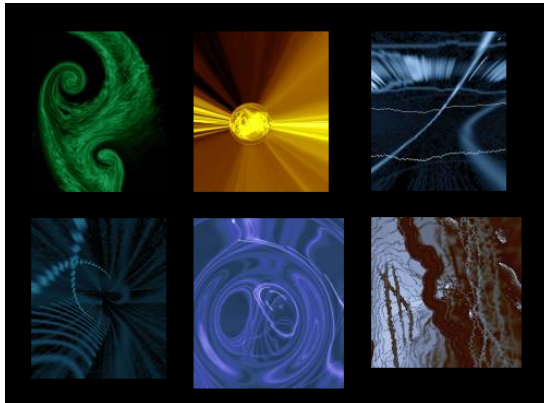
Trained with **Gradient Boosting Trees(GBT)** on 2.8G data.

Predict Arousal/Valence of music segments with high accuracy.



3D Tour

Use pre-defined visualizations from Light.js/Three.js.
Show arousal/valence values with HighCharts.js.
Synchronize with the music using backend analysis results.
Totally differ from old-fashioned music visualization:



Demo!