Topic

* polyphonic music transcription

Challenges

* core problem: Multiple Pitch Estimation
* Source separation
* note onset /offset
* instrument recognition
* beat tracking
* identification of dynamics/ expression
* Type setting musical notation

Risks

* Octave errors (2)
* Semitone errors (1)
* Mixed notes (2)
* Nonsensical music notation as output (5)
* Overfitting model to data (3)
* Models that are limited to one instrument type (4)

Tools

* Spectrogram analysis
* State-based transition models for note evolution and interdependencies
* NMF methods, Matrix Factorization for spectrograms
* Python Librosa music analysis library
* Python Machine Learning libraries

Opportunities

* Symphonic music transcription is an open problem
* Saxophone, wind instrument transcription. Pianos are considered solved due to the large amount of available data
* Score informed / context informed transcription systems
* Lack of annotated ground truths. Use of musicological learning software can help generate ground truth annotated music pieces
* No suitable representations for notating singing performances
* Non-western music transcription is unexplored

Completed work

* Review of state-of-the-art techniques in AMT
* Construction of Chromagram, Spectrogram and tempogram for a blues recording

Current focus

* STFT theory
* Machine learning theory and model evaluation criteria
* Reducing complexity of recordings. Investigating characteristics chords like dominant chords for spectral characteristics