Drumtranscription

Detect drums in music

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Problem

What is Drum Transcription?

Classical MIR Problem

Get information out of a piece of music

Find time point of drums hit in a mixed piece of music

Use Case

Generate a drum transcription

Sheet music

Audio to Midi

Beats-Per-Minute Detection

Tempo Detection

...

How does NMF work?

Basically pattern matching

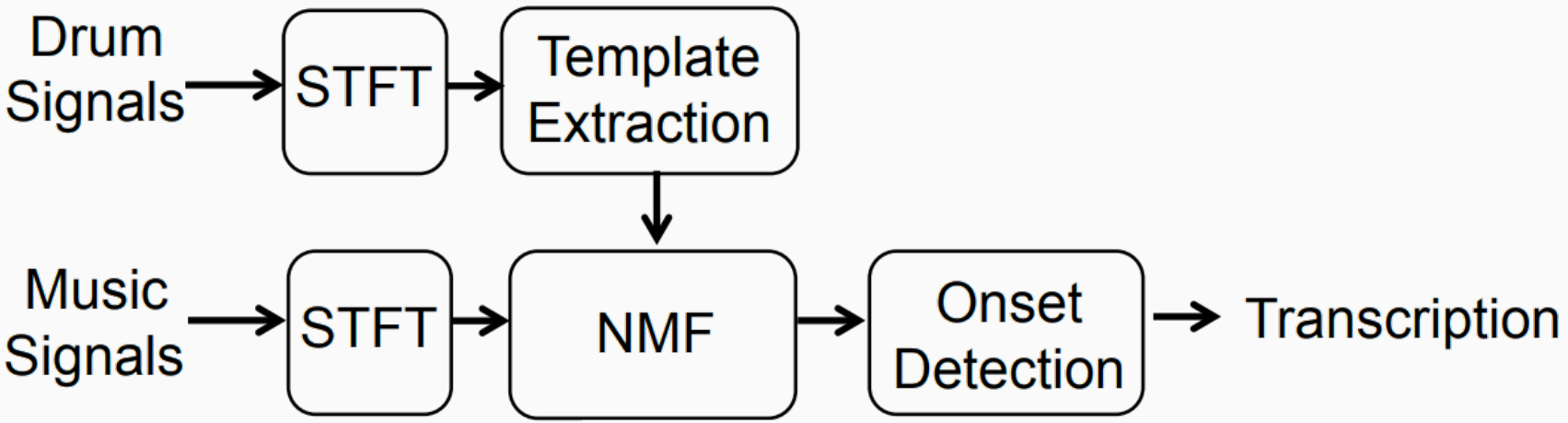

Figure: NMF Flowchart

Template Extraction

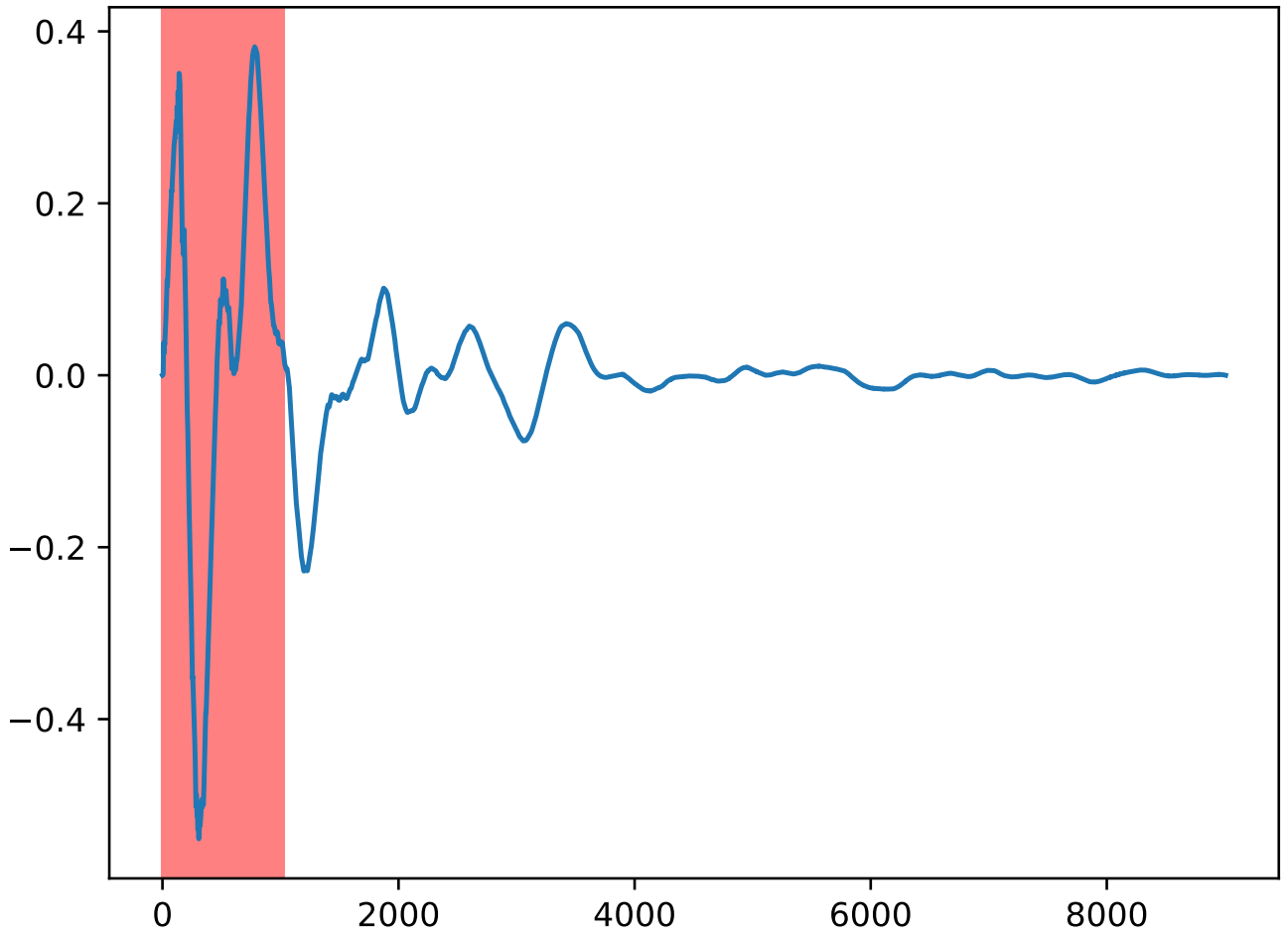

Figure: Bassdrum Template

NMF

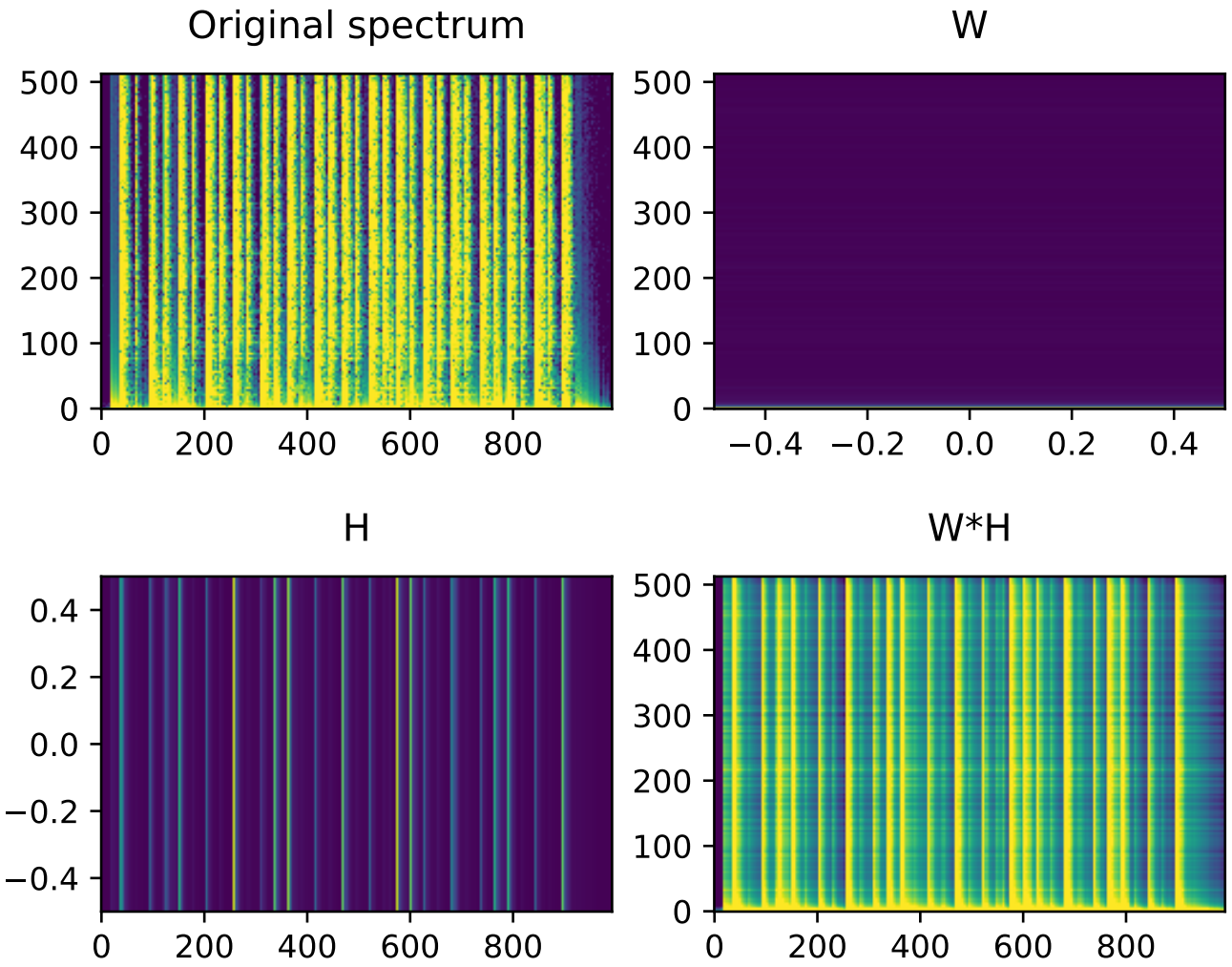

Figure: NMF Matrixen

Onset detection

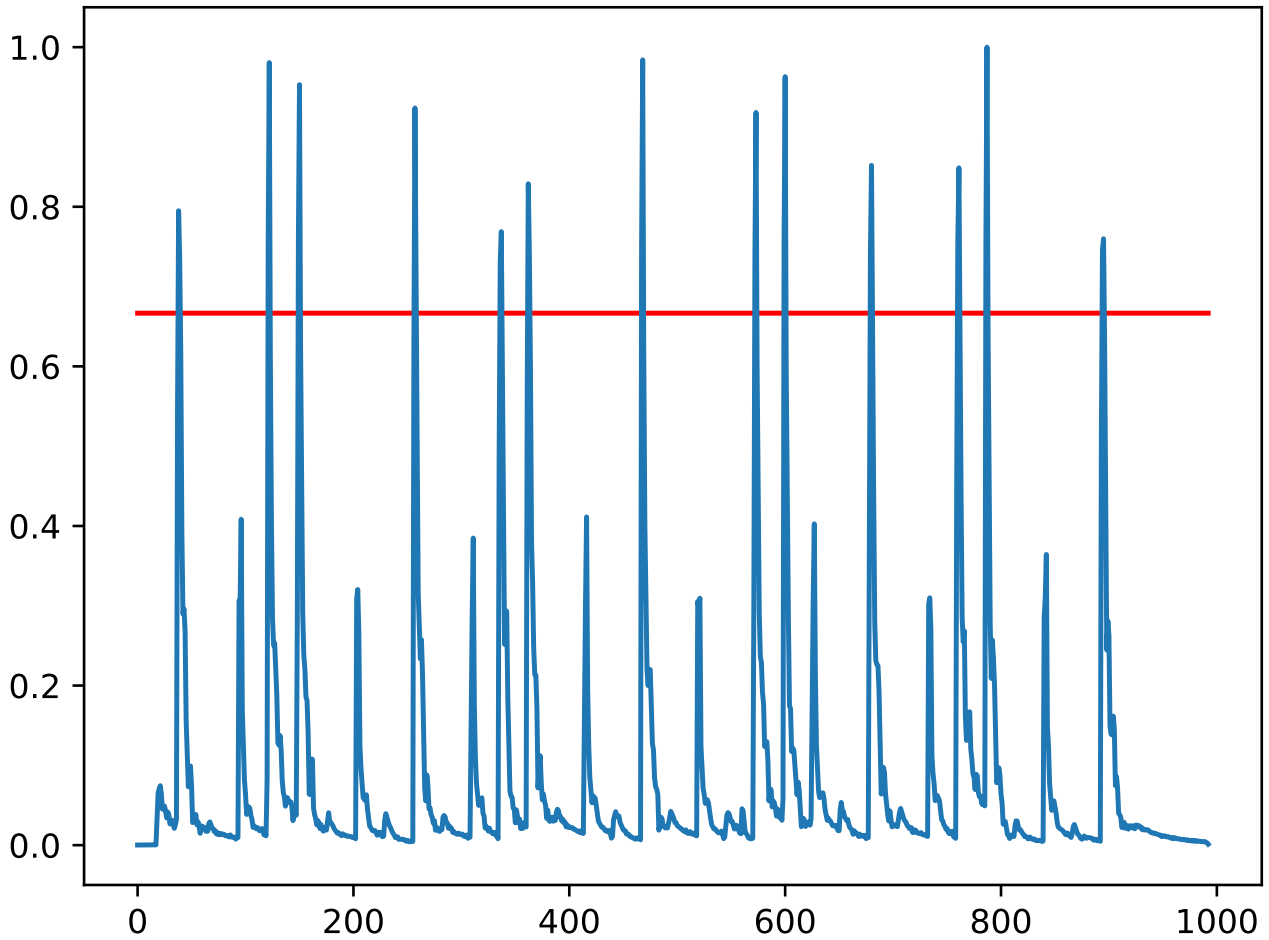

Figure: Activation Matrix

Derivation

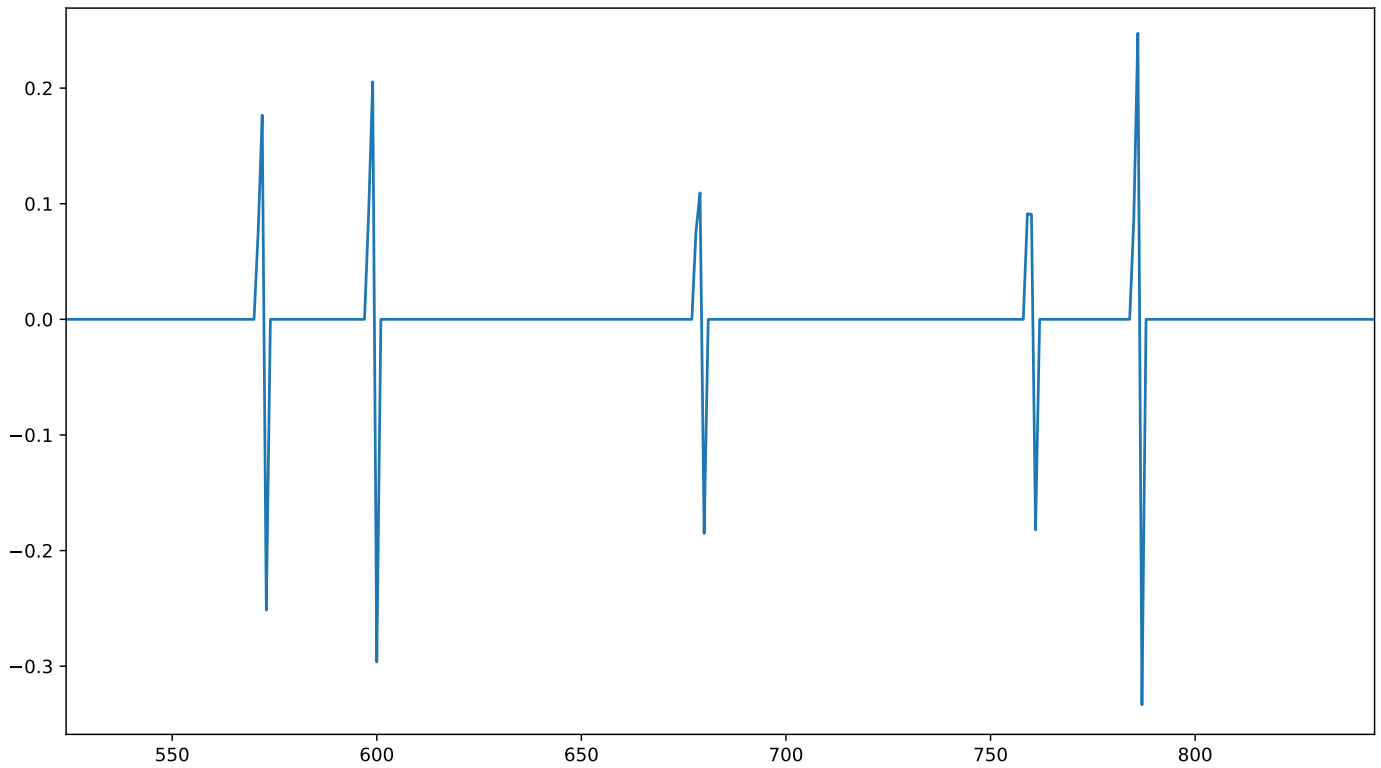

Figure: Derivation

Evaluation

ENST Drum Sampleset [1] (Wet-Mix)

3 drummers on 3 drum kits

207 drum tracks with annotations

Comparing detected bassdrums with the annotations (with epsilon range)

Count correct hits & false positives

[1] TELECOM ParisTech - Dep. TSIe

Evaluation Results

Drummer	1	2	3
# Files	63	75	69
Median_P	0.25	0.93	0.86
Mean_P	0.27	0.89	0.80
σ_P	0.22	0.12	0.18
Median_{FP}	0.13	0.0	0.0
Mean_{FP}	0.23	0.0	0.001
σ_{FP}	0.29	0.0	0.001

Table: Results

Conclusion

Works surprisingly well for its simplicity

If the template was taken from the sample set or a similar one

Snare and Kick can be confused, as they look very similar in the spectrogram

Future work

Next steps:

- Extend to track more sounds (Hi-Hat, Snare, ...)
- Automatic transient detection
- Improved peak picking algorithm
- Interpolation between frames for more accurate results

Future ideas: Adaptive template matrix

Thanks for listening!

Questions?