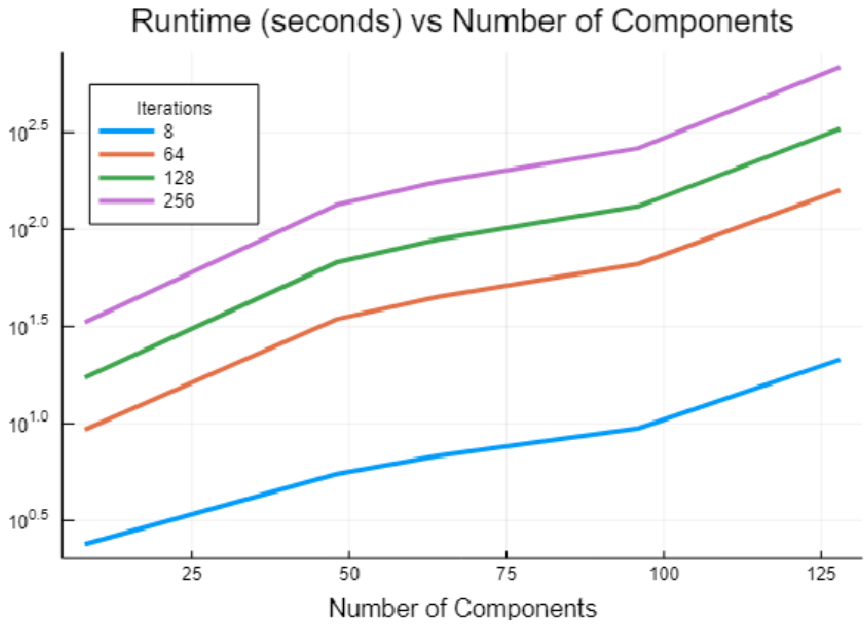
Nonnegative Matrix Factorisation

Dan Jacobellis, Tyler Masthay

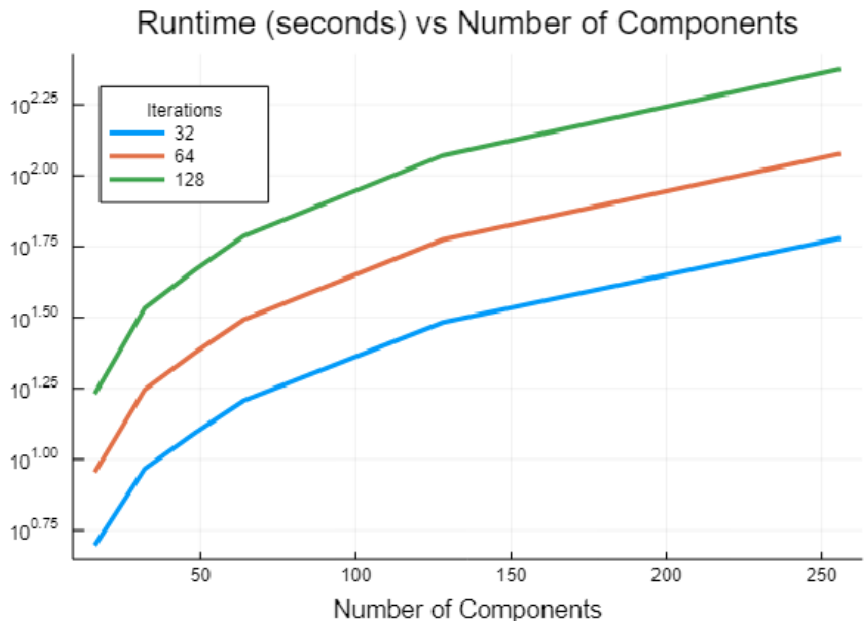
Completed work

- Implemented the multiplicative update NMF algorithm on a GPU using Julia bindings to CUDA.
- Performing timing benchmarks for two recordings, one monophonic and one polyphonic.
  - Measured runtime as function of number of components and number of iterations.
    * Increasing the number of components follows expected scaling up to 128 components
    * Using more than 128 components (for a frame size of 40000) appears to alter the scaling.
    * Probably caused by mismatch of GPU cache size and with matrix size
- Examined required number of iterations for acceptable transcription

Monophonic



Polyphonic



TODO

- Test performance as function of frame size
- compare performance with MATLAB and sci-kit learn implementations
- Try using nvidia profiler (nvprof) to find ways to improve performance