

Artificial Dataset

The un-mixing matrix plot can be found below. The variance of the two components is 1.

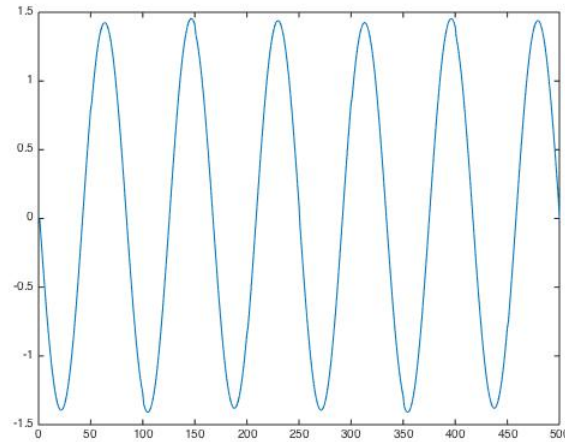


Figure 1: unmixing Matrix, component 1

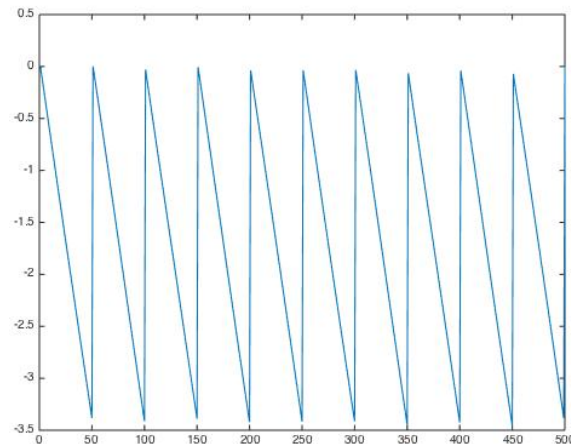


Figure 2: unmixing matrix, component 2

Audio1/2/3

Results when playing `soundsc(W_audio(2,:)*audio1, 44100)`: I can tell that the main guitar cord is missing from the playback, so the unmixing component has separated out the guitar channel.

Results when playing `soundsc(W_audio(1,:)*audio1, 44100)`: I can tell that the drum goes missing during the playback, so the first component can separate out the drum channel.

Results when playing `soundsc(W_audio(1,:)*audio2, 44100)`: the effect of unmixing bass instrument is clear and apparent.

Results when playing `soundsc(W_audio(2,:)*audio2, 44100)`: there is very little to no effect on the unmixing probably due to the lack of guitar elements in the audio track.

On audio3, there is very little effect from the ICA, probably because it is piano/cello dual and has no bass instruments involved.

Identify the music:

Audio 1: Say it Ain't So – Weezer

Audio 2: Billie Jean – Michael Jackson

Audio 3: Spiegel Im Spiegel – Dietmar Schwalker and Alexander Malter

Patches

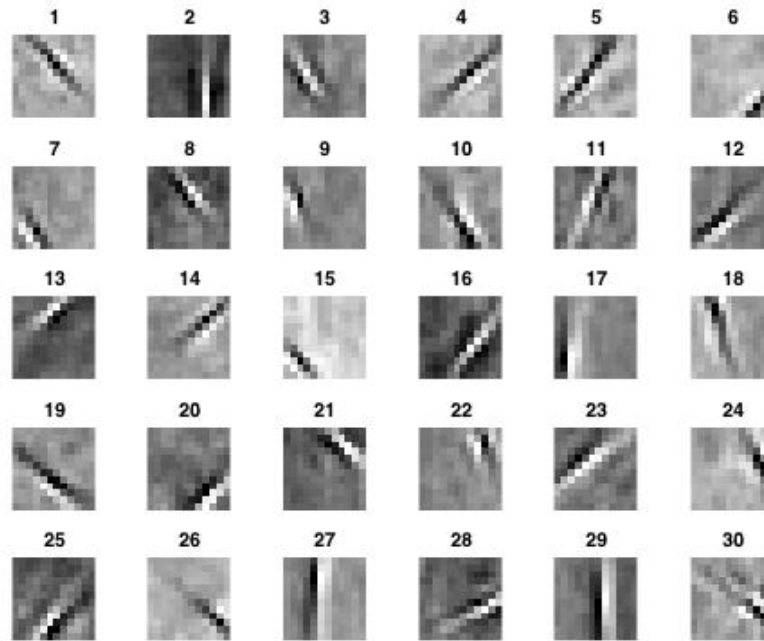


Figure 3, Display Column A, mixing matrix

From figure 3, I can tell that each of the frames represents one element (feature) of the image batch, and these features can be seen as extracted from the W matrix. The column diagram of the W matrix is shown below, and I can see the inversion between W and A .

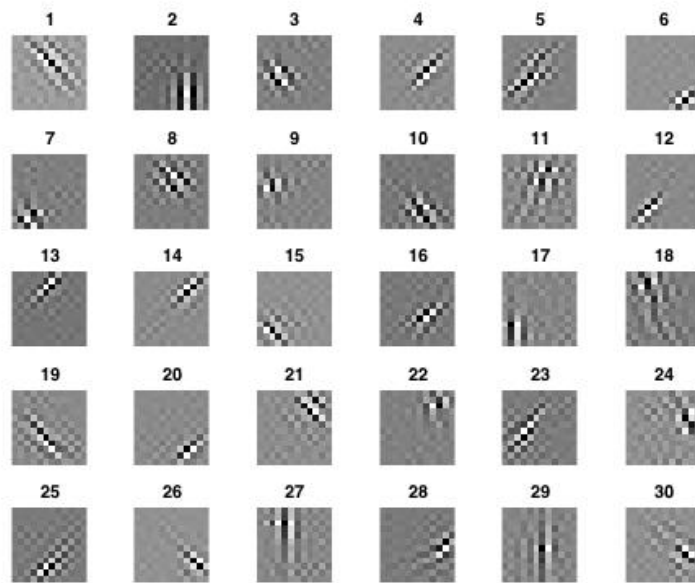


Figure 4: Display Column W transpose