

Is a system trained to discriminate between
speech and 'noise' able to discriminate between
music and 'noise' ?
SOGM project, Blok 2

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Background:

There are several indications that music and speech share a common history in evolution. Although the brain structures processing speech and music appear to operate independently (left hemisphere being lateralized for speech, right hemisphere for music (Kolb & Whishaw, 1947; Marin & Perry, 1999; Peretz, 2006)), there are many similarities how the brain is activated while interpreting speech and music (Zatorre et al., 1994; Trehub et al., 1999).

The purpose of my project is to create a system to investigate the similarities of speech and music processing. The focus will be the identification of a sound as either 'noise' or speech. And then to see whether this system will identify music as either 'noise' or speech.

Outline:

- ▶ The plan is to program a neural network and;
- ▶ to train it to distinguish speech from 'noise'.

After the system proved successful at discriminating between speech and 'noise':

- ▶ Test the abilities to discriminate music from 'noise'

Specifications

Input - Output

- ▶ Single trial:
 - ▶ input: a soundfile (preclassified)
 - ▶ output: classification as: speech or 'noise'
 - ▶ when learning the classification will be compared to the expected result (feedback)
- ▶ Full learn cycle:
 - ▶ input: collection of preclassified soundfiles
 - ▶ output: percentage of correct classification (learning curves?)
- ▶ Final trials:
 - ▶ input: collection of musicfragments
 - ▶ output: percentage classified as speech and percentage classified as 'noise'

What will I learn?

- ▶ How to program neural networks
- ▶ Make an environment to schedule multiple trials
- ▶ Programming with a scientific approach
- ▶ What data manipulations are needed to get useful input

Approach:

- ▶ Delve into neural networks (Coursera course, university webpages, etc.)
- ▶ Investigate and select usefull sound descriptors to use as input
- ▶ Collect a corpus of test material