Misophonia - Filter

Portfolio Project Description

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Imagine you're staying at a hotel that has a leaking faucet. You're getting sleepy but over time the sound of the leaking faucet becomes so loud you can't sleep or even think. No matter if this example works better with a ticking clock or a snoring person, we can all agree that sounds have the ability to evoke negative emotions. Now imagine such negative emotions are elicited by ordinary sounds on a daily basis. On top of that, imagine the negative response to the sounds is even stronger, resulting in rage, anxiety, or panic. Then you get an idea of what a person with Misophonia experiences. The most common sounds are oral sounds: checking, smacking, swallowing, slurping, or simply speaking with a dry mouth. You've never heard of such thing? There are no official numbers on the prevalence of Misophonia, but reports range from 15%[1] to 20%[2] of the population. Even worse, there are no evidence-based methods for treatment.

However, what if there was a device in your ear that would filter out the problematic sounds in your surroundings? Such a filter would have to (1) classify the sounds that you want to be filtered and (2) anticipate these sounds in order to filter them out before you can hear them. Such an ambitious project might be way beyond the scope of a portfolio project at DSR, but accomplishing (1) seems to be a reasonable goal.

As a first step, I started collecting and labelling educational youtube videos including speakers with a strong habit of making a smacking sound before a sentence. Among such videos are the Coursera machine learning lectures of the beloved Andrew Ng[3]. Filtering out such sounds would allow people with Misophonia to have painless access to excellent teaching.

As a Misophoner myself, I have great motivation to achieve as much as possible within the time given. I have started looking into Mel spectograms and, thanks to the excellent teaching at DSR, I have some solid understanding of convolutional neural networks and LSTMs.

[1] Dozier, 2014. https://misophoniainstitute.org/prevalence-of-misophonia/.

[2] Palumbo, D. B., Alsalman, O., De Ridder, D., Song, J.-J., Vanneste, S. (2018). Misophonia and Potential Underlying Mechanisms: A Perspective. Frontiers in Psychology, 9, 953. http://doi.org/10.3389/fpsyg.2018.00953.

[3] You might enjoy the fact that Andrew both provides a tool as well as the problem for which the tool can be used.