Peltarion hackathon idea

Monaural speech enhancement for improving the future's hearing aids

Overview

For people with hearing loss, it can be very difficult to understand and separate voices in noisy environments. This problem may soon be history thanks to new groundbreaking algorithms that are designed to recognise and separate voices efficiently in unknown sound environments.

People with normal hearing are usually able to understand each other without effort when communicating in noisy environments. However, for people with hearing loss, it is very challenging to understand and separate voices in noisy environments, and a hearing aid may really help.

Two scenarios that can be addressed:

1. Noise from speech separation to enable speech amplification and noise reduction. This scenario sets out to solve the challenges of one-to-one conversations in noisy spaces such as car cabins.

2. Speech from speech & noise separation. This scenario involves several speakers, and the hearing aid user may be interested in hearing some or all of them. The solution is an algorithm that can separate voices while reducing noise.

Read more

https://m.phys.org/news/2019-01-artificial-neural-networks-life-easier.html

Solution approach

1. Convert speech audio into Spectrogram images

2. Resize, scale & adjust images

3. Zip & upload to the Peltarion platform

4. Build, train & evaluate deep learning models

5. Deploy & query the model directly via the Peltarion platform

Dataset(s)

Clean and noisy parallel speech database. The database was designed to train and test speech enhancement methods that operate at 48kHz. A more detailed description can be found in the papers associated with the database.

- https://datashare.is.ed.ac.uk/handle/10283/2791

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Over 300 companies and organizations have used Peltarion's AI technology including NASA, Tesla, iZettle, General Electric, Dell, BMW, Deutsche Bank, Lloyds Banking Group, and the Universities of Harvard, MIT and Oxford. Peltarion was founded in Stockholm, Sweden in 2004.

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