# Removing Noise from Speech with Deep Learning

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# Introduction

Our task was to reduce noise from speech using deep learning.

The goal was to preserve sound quality as much as we can, while reducing the noise.

# Motivation

Cool noise reducing hardware.

Figure 1: Sennheiser GSP-500

But this is hardware, and we are computer scientists, not electrical engineers.

# Motivation

Noise cancelling software.

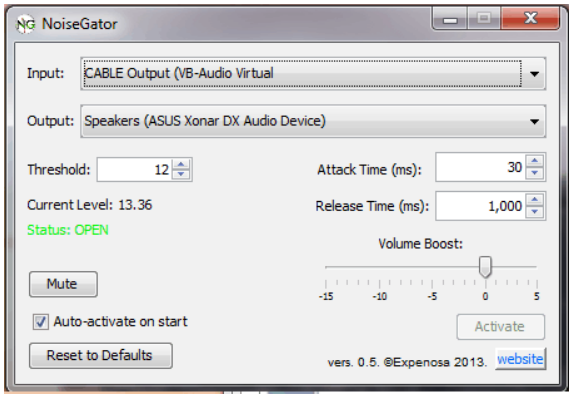


Figure 2: NoiseGator Software

If sound is above the treshold, it goes through.
Else it is cancelled.

Not flexible enough.
Deep learning could do a better job.

# Data pipeline

Training phase.

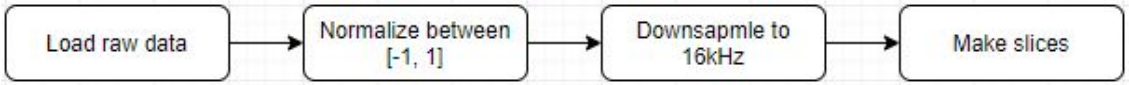


Figure 3: Training preprocessing

We do this on the noisy and clean data as well.
Input: Noisy slices
Output: Clean slices

Data augmentation: Overlapping slices

# Full data pipeline

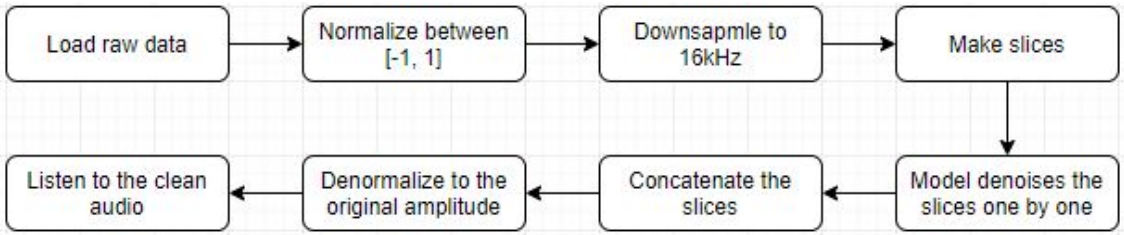


Figure 4: Inference preprocessing

Model is a black box now, it will be elaborated later.

# Tortor posuere ac ut consequat:

1. Eu augue ut lectus arcu bibendum at varius.
2. Nisl suscipit adipiscing bibendum est ultricies integer quis.
3. Facilisi etiam dignissim diam quis enim lobortis scelerisque.
4. **Facilisis mauris sit amet massa vitae tortor condimentum.**

# Maths

Inline $sin^2(x)$ maths.
Display maths:

$$\frac{\frac{1}{x} + \frac{1}{y}}{y - z}$$

# Wavenet

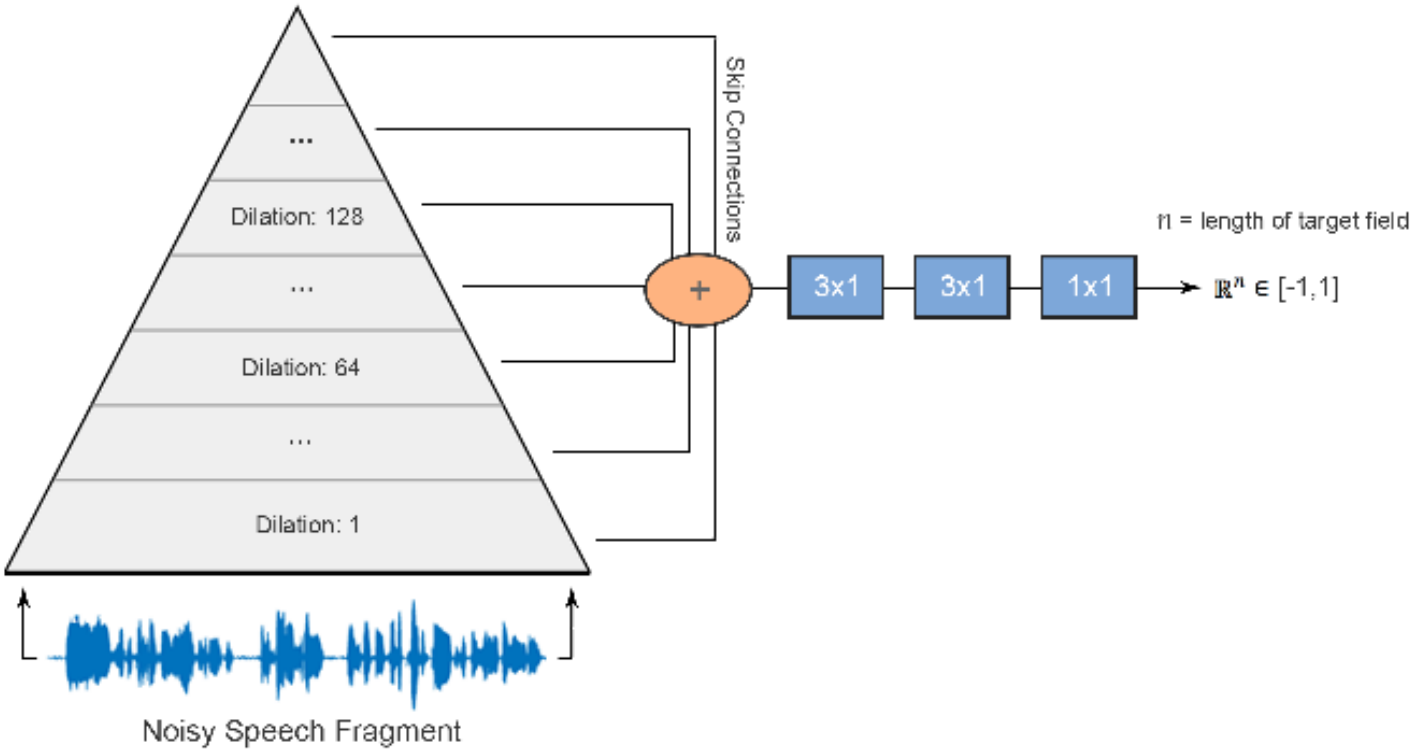


Figure 5: Wavenet

# Thank you for your attention

Sources:


- Dario Rethage, Jordi Pons, and Xavier Serra. “A Wavenet for Speech Denoising”. In: (2018). arXiv:1706.07162
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