

# Noise Dataset for Deep Learning-Based Speech Enhancement

Faustas Žiliajevas, Justina Ramonaitė, Daniel Zakševski, Gražina Korvel, Gintautas Tamulevičius

Institute of Data Science and Digital Technologies, Vilnius University, Vilnius, Lithuania



## Introduction

In the real world, human speech is often impeded by ambient noise, such as passing cars, background chatter, or other environmental sounds. While humans have adapted to filter out most of this noise, computers struggle to do the same. Even with advanced noise cancellation algorithms, unpredictable and ever-changing noise remains a significant challenge. To improve these algorithms, researchers are using many different types of real-world noise to train artificial neural networks. This requires diverse and regularly updated noise datasets.

## Problem statement

Since noise is unpredictable and ever-changing, there will never be enough samples to create the perfect noise cancellation algorithm. There is also the challenge of covering all existing types of noise. Because of these problems new noise samples are always needed.

## Research goal

The goal of this dataset is to provide a **new and unique source** of noise to create and enhance various noise cancellation algorithms.

## Recording information

The recordings were collected in Vilnius, Lithuania, in 2024. They were recorded with a Shure SM7B dynamic microphone and stored as WAV files. The selected length of the recordings is **30 minutes**, however, when the noise itself is short-lasting, the duration is adjusted accordingly.

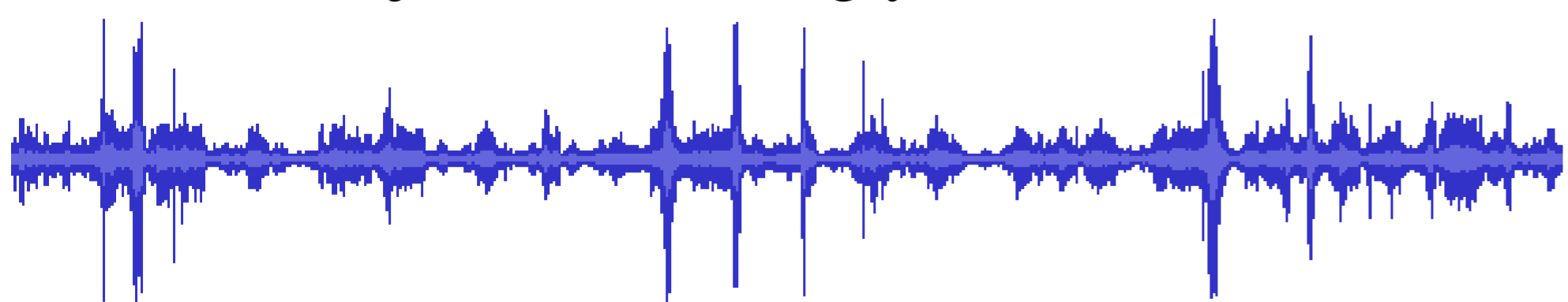


Fig. 1. Visual representation of one of the recordings (bus stop)

## About the dataset

The dataset contains both outdoor and indoor noises which are further subdivided into home and office noise for indoor, and into nature, street and construction noise for outdoor.

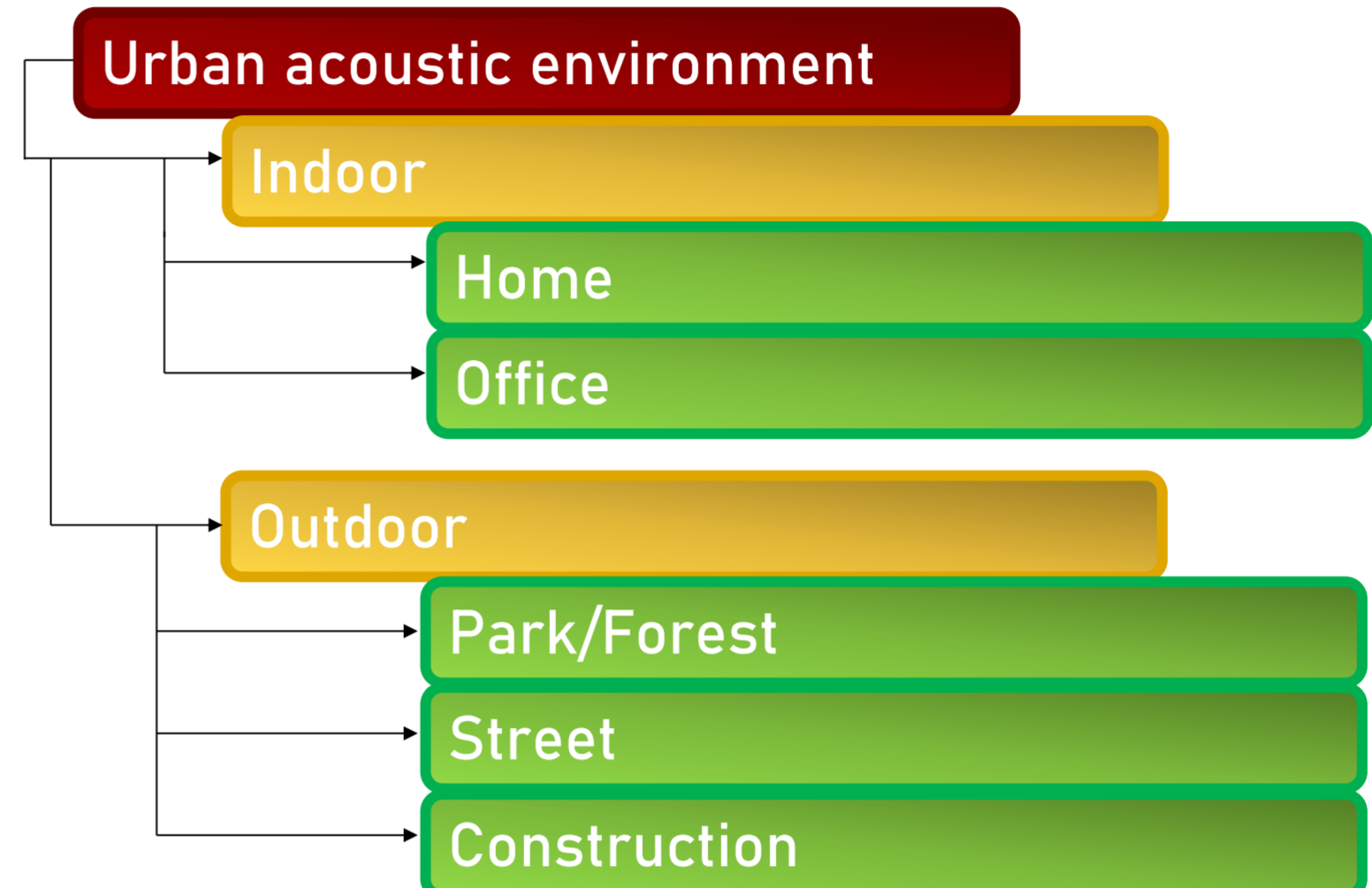


Fig. 2. Taxonomy of the dataset

## Types of noise in the dataset

Noise	Duration
Bus stop	30 min
Busy street	30 min
Street	30 min
Garbage truck	1 min 45 s
Construction	30 min
Fan	30 min
Forest	30 min
Washing machine	30 min
Kitchen hood	30 min
Shower	30 min
Rain	30 min
Various neighborhood sounds	30 min
Microwave	5 min 30 s
Electric kettle	4 min 30 s
Car wash	5 min
Keyboard	30 min

## What is planned next?

- Continue updating the dataset with new noise recordings and make it available online free of charge.
- Contribute to the field of denoising by creating bigger, more professional and more specified noise datasets.

## Acknowledgments



Funded by  
the European Union

This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-MIP-24-118.