

# An Analysis of Speech Enhancement Systems in a Multi-Lingual Setting

Thesis BA/FA  
Supervisor Tobias Raichle  
Examiner Prof. Dr.-Ing. Bin Yang

## Motivation

Speech enhancement studies improving the quality of spoken language and finds applications as a front-end in automatic speech recognition, telecommunication or hearing aids. Generally, speech enhancement covers multiple types of corruptions (noise, reverberations, echoes, compression artifacts etc.) but most previous works focus on denoising.

Speech enhancement systems are generally trained and evaluated in English. While classical approaches only consider acoustic features, contemporary approaches using machine learning have the capability to incorporate semantic features that are language-dependent. A preliminary study found the performance of speech enhancement systems drops on languages other than English. The goal of this thesis is to conduct a quantitative and qualitative analysis of the performance of neural speech enhancement systems and to answer the question how much semantic information is used by these systems.

An optional task is to fine-tune a model to this setting.

## Objectives

- Gather multi-lingual data
- Implement a framework for and evaluating speech enhancement models
- Conduct experiments to asses the performance of speech enhancement models in a multi-lingual setting
- *Optional*: Fine-tune a model to perform better on multiple languages

## Prerequisites

- Interest in Deep Learning
- Good programming skills in Python
- *Optional*: First experiences in ML-frameworks (Preferably PyTorch)

If this topic has sparked your interest, write me an email and we can discuss the proposal in more detail. Please include your current transcript and CV.