

## Announcement

06.12.2020

### BACHELOR/MASTER THESIS:

# Predicting the quality of noisy speech in fullband communication scenarios

## DESCRIPTION

Telephone communication has undergone a significant change from standard narrowband fixed telephone to Voice-over-IP (VoIP) scenarios where the full audible bandwidth is transmitted. The broader super-wideband (20-14000 Hz) or fullband (20-20000 Hz) audio channel does not only improve the quality and naturalness of the transmitted speech, but also carries background and circuit noise with a wider bandwidth, thus threatening the quality improvement reached.

It is the aim of the thesis to empirically analyse the effects of noise on VoIP speech quality in super-wideband and fullband transmission scenarios. For this purpose, subjective experiments with human participants need to be planned and carried out in which the noise level, type of noise, and speech level are varied in a controlled way, and judgments on quality are solicited from the test participants. The levels have to be carefully measured and adjusted in order to consider the perceived loudness of both speech and noise. For this aim, concepts from telephonometry (loudness ratings, noise weightings, noise rendering) need to be transferred to the fullband scenario.

The subjective quality judgments will be analyzed, and form a basis for extensions to existing quality prediction models. More precisely, the work will lead to extensions of the so-called E-model which is used on an international level for transmission planning of VoIP scenarios, and which is standardized by the International Telecommunication Union in ITU-T Rec. G.107, G.107.1 and G.107.2. It is anticipated that the results will be used in scientific publications and standard contributions to the ITU-T.

The experiments which are carried out in the thesis will be in German, so German communication skills with test participants are required.

## REQUIREMENTS

- Experience with speech signal processing (e.g. via the course Speech Communication)
- Knowledge in speech quality (e.g. via the course Usability Engineering) as well as in acoustics (e.g. from courses in Audio Communication) are a plus
- Great interest in the topic, as well as good organizational skills

## CONTACT

Thilo Michael, [thilo.michael@tu-berlin.de](mailto:thilo.michael@tu-berlin.de), and Sebastian Möller, [sebastian.moeller@tu-berlin.de](mailto:sebastian.moeller@tu-berlin.de)

(Deadline: 30.03.2020)