Lecture: Speech Enhancement
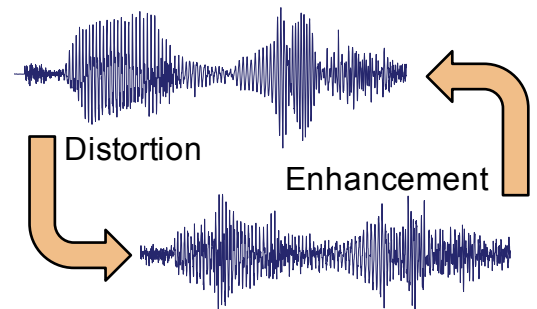## WS 2015/2016

Instructor

Prof. Dr. ir. Emanuël Habets

Format

Lecture:	2 SWS, Tuesday 10:15-11:45
ECTS-Credits:	2,5
Language:	English
First Meeting:	Tuesday, 13.10.2015, 10:15-11:45
Second Meeting:	Tuesday, 02.11.2015, 10:15-11:45
Place:	Room 3R4.04, Am Wolfsmantel 33

Distortion

Enhancement

Content

We live in a noisy world! In all applications that are related to speech from sound recording, hands-free communication, teleconferencing, hearing aids, cochlear implants, to human-machine interfaces, a speech signal of interest captured by one or more microphones is contaminated by noise and reverberation. Depending on the level of noise and reverberation, the quality and intelligibility of the speech can be greatly reduced. Therefore, it is highly desirable, and sometimes even indispensable, to "clean up" the noisy signals using signal processing techniques before transmission or reproduction.

In this course well known and state-of-the-art methods for noise reduction and dereverberation, with one or multiple microphones, are discussed.

The goal of this course is to provide a strong foundation for researchers, engineers, and graduate students who are interested in the problem of signal and speech enhancement.

Learning Outcomes and Competences

- Derive optimal single- and multi-channel filters to reduce noise and reverberation.
- Evaluate and compare the performance of single- and multi-channel filters for speech enhancement.
- Understand the limitations and challenges of existing speech enhancement systems.
- Understand the importance of binaural cues and the influence of a speech enhancement system on the binaural cues in the context of hearing aids.
- Design a microphone array and analyze its performance.
- Design a speech enhancement system for a given acoustic scenario.
- Evaluate both subjectively and objectively the performance of a speech enhancement system in terms of the speech quality and intelligibility.

For further information please contact:
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