Proposal for a Masterthesis

**Topic:** Learning Data-Dependent Transformations for Ego-Noise Suppression

**Description:**
Robot audition describes the research area of human-robot interaction by speech. Therefore, robots are often equipped with microphone arrays to capture their surrounding acoustic scene. If the robot is moving, the recorded microphone signals are significantly distorted by self-induced noise emitted from the various moving mechanical parts of the robot.

Various algorithms have been proposed to deal with this problem, e.g., [1]. Most approaches work in a transform domain, i.e., classically the STFT domain due to its sparsifying nature for speech signals. Recently, increasing research effort has been spent on learning transformations based on training data. An often used objective is to enforce sparsity in the transform domain, e.g., [2]. Learning transformations instead of employing data-independent ones has the merit of tailoring transformations to specific applications.

In this thesis the potential of learning transformations for ego-noise suppression should be examined. The implemented algorithms should be evaluated against well-known STFT-based approaches with respect to their effect on noise suppression algorithms.

As prerequisites, the student should have interest in signal processing and machine learning algorithms, affinity to math and Matlab programming experience.

![Figure 1: Humanoid robot NAO](image)


**Supervisor:** M.Sc. Thomas Haubner, room 05.018 (Cauerstr. 7), thomas.haubner@FAU.de

**Professor:** Prof. Dr.-Ing. Walter Kellermann

**Available:** Immediately