

# Reverberation resistive microphone input for speech commands recognition of robot

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## Abstract

This thesis investigates possibilities of increasing speech recognition performance, which is used in four-wheel ROBOT FIT faculty platform. The system have been suffering problems with distant speech recognition so far. The reason of these troubles is *reverberation* which appears in acoustic rooms and degrades the resulting signal at receiver.

The object is to reduce reverberation maximally. There is a lot of solutions, less or more robust, with different hardware requirements. For our purposes, *blind impulse response shortening* algorithm has been chosen. It has generally low computational requirements, but still achieves the impulse response effect, namely early reflections, reduction.

Interaction ability is a crucial feature for a robot. If it was capable of distant communication, it would increase its usability significantly. Here, an improvement was made, because the used implementation uplifts the speech recognition accuracy three times and reduces error rate down to approximately 5 % at most defined commands.

The product of this thesis is libraries and applications system, which integrates external Distant Speech Recognition enhancements toolkit (DSR) into software equipment of the robot, and is designed to be easily extended and tested in the future.

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