

Sensor Fusion, TSRT14

Localization Using a Microphone Network
Data Description

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1 Introduction

This document contains information about the reference dataset in TSRT14. The dataset consists of three `.mat` files, `calibration-data.mat`, `data.mat` and `qualisys-data.mat`, and a `.wav` file, `raw-audio-data.wav`. The `calibration-data` and the `data` files are explained separately in the following section. The package also includes a video which illustrates the two collected datasets.

2 Dataset

The `data` and `calibration-data` files have six stored variables summarized in Table 1.

2.1 Calibration

The `calibration-data` data file only contains `fs` and `tphat` as the robot does not move during the data collection and the microphones are arranged to be at an equal distance from the speaker at all times.

Table 1: Variables in `data` and `calibration-data` files.

Variable	Description
<code>fs</code>	Sampling frequency [Hz]
<code>mic_locations</code>	Microphone locations. The array is 2×8 where the first row corresponds to x and the second to y . Given in meters.
<code>tphat</code>	Estimated time of arrival of pulse per microphone. Given as $8 \times N$ where N is the number of pulses and 8 the number of microphones.
<code>x0</code>	The initial position of the robot.
<code>position</code>	The true trajectory of the robot. Approximately synced to the times in <code>tphat</code> . $3 \times N$ array where the first row is the time relative the initial time. Second and third row correspond to x and y position, respectively.



Figure 1: Data collection setup.

2.2 Data

The `data` file contains data from eight microphones positioned according to the `mic_locations` variable. The data was gathered such that microphones 1–4 constitute the “first” setup and microphones 5–8 the second. However, the user is of course free to choose another split.

The data collection is visualized in Fig. 1.