

P&D Information Systems and Signal Processing

Week 4 - March 2 - 6, 2020

Demo

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Version 1.0

Part 1: Scenario and experiments

Use the microphone signals recorded in Week 2 to construct a scenario with a target audio source to the left (i.e. left of the broadside direction, azimuthal direction -90° or -60°) and an interfering source to the right (i.e. right of the broadside direction, azimuthal direction 60° or 90°). The scenario should be time-varying, i.e. the position of the sources changes every 5 seconds in a sequence as follows: $\{-90^\circ, 90^\circ\}$, $\{-90^\circ, 60^\circ\}$, $\{-60^\circ, 60^\circ\}$, $\{-60^\circ, 90^\circ\}$, $\{-90^\circ, 60^\circ\}$.

Create an m-file that estimates the DOA's over time. The estimated DOA for the target audio source is used to define the DAS BF in a GSC, and then the GSC estimates the target audio source signal, suppressing the interfering source signal. The DOA estimation and the GSC can use the linear microphone array alone, or the head mounted microphones alone, or all microphones together (whichever option is most appropriate).

Run simulations and find a way to quantify and demonstrate the achieved performance. Tune the parameters of the DOA estimation and the GSC (including the adaptive filter) to achieve the best possible performance.

Part 2: Report

Describe the constructed scenario, the system tuning, as well as the obtained results and achieved performance in a brief report (max 5 pages). Include links to audio files. Submit the report and code to santiago.ruiz@esat.kuleuven.be

Deadline: Friday March 6, 2020 (23:59).

Part 3: Demo

Demonstrate the final system to the teaching assistant in the lab session on Friday March 6, 2020.

¹For questions and remarks: santiago.ruiz@esat.kuleuven.be.