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**Audio Signal Zoom for Small Microphone Arrays**

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Nowadays, often do people use their smartphones or cameras to capture videos of the memorable moments. It is convenient to visually zoom in towards the subject of interest and suppress the unwanted interferences. A problem is then posed - whether the same could be achieved in audio terms. Despite demonstrating a high spatial selectivity, current approaches usually require large microphone arrays. This motivates the project to explore and develop alternative approaches that are suitable for small devices like smartphones.

This report firstly outlines the process of software simulation to capture audio containing two persons talking. Using the synthetic audio data, the report proposes several audio zooming algorithms, including time-frequency masking, beamforming and machine learning. The performance of the zooming algorithms under different reverberant conditions is then evaluated in terms of speech quality and intelligibility through both subjective and objective metrics. The report ultimately provides an insight on the practicality of implementing the algorithms on smartphones.