

ACOUSTICS2008/1525 differential microphone array for speech recognition

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Speech recognition applications embedded on a PDA are already available on the market. The usual hardware for this kind of systems is a single microphone mounted on the PDA, giving good results within quiet environments. Though, the recognition rate falls drastically as the signal to noise ratio decreases. Arrays of microphones are then particularly interesting, allowing the discrimination of useful sounds sources within parasitic ones, thanks to an improved directivity pattern.

In speech recognition applications on PDA, a trade-off is to be found on an array small enough to guarantee the ergonomics of the whole system, while operating on a bandwidth covering the frequency range of human voice, from 300 Hz up to 6 kHz and low distortion ratio.

Differential arrays are well adapted to fulfill these specifications, since they are known to be robust and allowing small dimensions for a high directivity index. The performances could be improved by the addition of adaptive post-filtering and noise reduction algorithms.

This work describes the design and the implementation of a recording device dedicated to speech recognition applications on PDA, based on overlapping differential arrays. The assessment of its performances in noisy environment are carried out and show the system efficiency.