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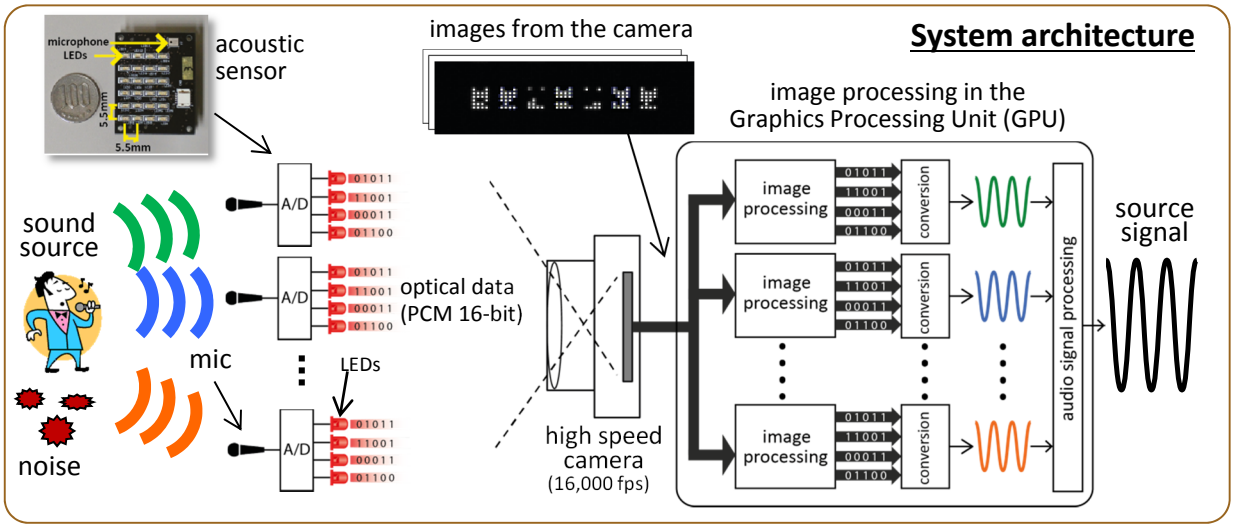
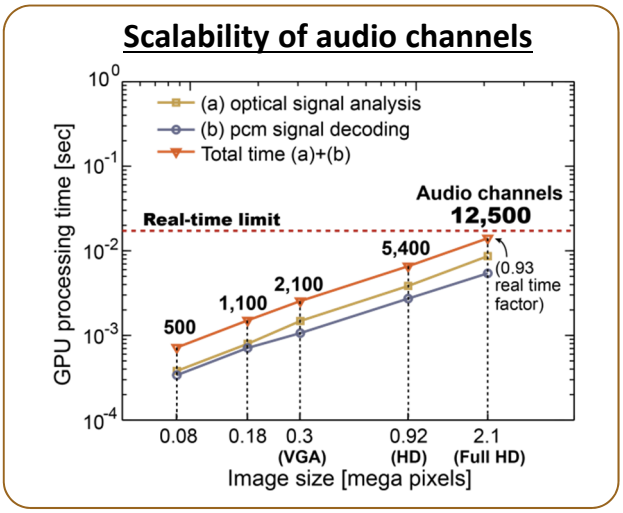
Capturing sound by light

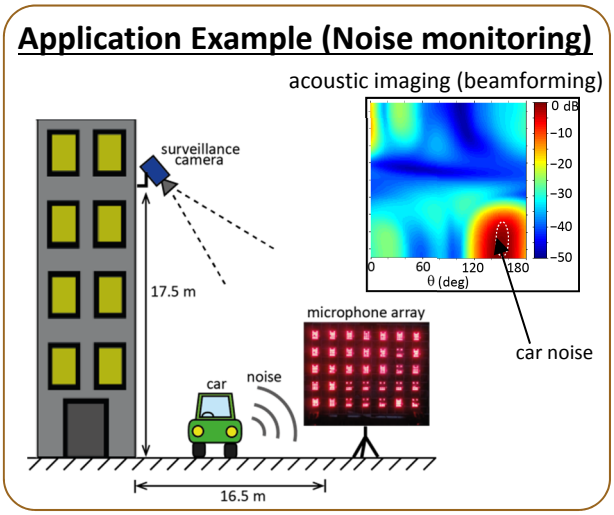
～Towards massive-channel audio sensing via LEDs and a camera～

Abstract

It is possible to listen to the sound from a desired direction and isolate the noise from others by properly aligning and mixing the signals of a microphone array. Moreover, large arrays produce better sound directionality, however, they are unrealistic due to the cost and complexity of the existent hardware. We developed a new multichannel system capable of capturing the audio signals of huge microphone arrays via Light Emitting Diodes (LEDs) and a high speed video camera. Our prototype employs a single Graphics Processing Unit (GPU) to perform massive parallel processing in order to achieve real-time performance. With such a large-scale system, superdirective audio focusing in wide areas will be possible in the future.







Related work

[1] Pablo Nava G., Kamamoto Y., Sato T. G., Shiraki Y., Harada N., Moriya T., "Image processing techniques for high speed camera-based free-field optical communication," in *Proc. IEEE Int. Conf. Signal and Image Processing Applications (ICSIPA)*, 2013.
[2] Pablo Nava G., Kamamoto Y., Sato T. G., Shiraki Y., Harada N., Moriya T., "Simultaneous acquisition of massive number of audio channels through optical means," in *Proc. 135th Convention of the Audio Engineering Society (AES)*, 2013.

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