## Noise reduction through Compressed Sensing

We present an exemplar-based method for noise reduction using missing data imputation: A noise-corrupted word is sparsely represented in an over-complete basis of exemplar (clean) speech signals using only the uncorrupted time-frequency elements of the word. Prior to recognition the parts of the spectrogramdominated by noise are replaced by clean speech estimates obtained by projecting the sparse representation in the basis. Since at low SNRs individual frames may contain few, if any, uncorrupted coefficients, the method tries to exploit all reliable information that is available in a word-length time window. We study the effectiveness of this approach on the Interspeech 2008 Consonant Challenge (VCV) data as well as on AURORA-2 data. Using oracle masks, we obtain obtain accuracies of 36-44% on the VCV data. On AURORA-2 we obtain an accuracy of 91% at SNR -5 dB, compared to 61% using a conventional frame-based approach, clearly illustrating the great potential of the method.

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