



NOISE POWER SPECTRAL DENSITY ESTIMATION FROM NOISY SPEECH USING ON-LINE TRAINED HIDDEN MARKOV MODELS (ThuAmPO4)



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★ Abstract :

In this paper we describe a method for estimation of noise power spectral densities from a noisy speech signal. The method is used in conjunction with a time–frequency domain speech presence detection method that provides connected time–frequency regions of each decision type. In speech absence regions hidden Markov models are trained on–line and in speech presence regions the trained models are used for MMSE optimum estimation. Both types of speech presence regions can be present in each frame and on–line training of the models in speech absence can be conducted while the models in speech presence are used for estimation. Experiments show that the proposed noise PSD estimation method consistently performs better than three state–of–the–art reference methods. For real–life noise types the special case of the hidden Markov model where it reduces to a Gaussian mixture model is shown to be nearly as good as the hidden Markov model.