Robust Noisy Speech Identification Using Frame Classifier Derived Features

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Abstract : This paper presents an approach for identifying noisy speech recording using a multi-layer perception (MLP) trained to predict phonemes from acoustic features. Characteristics of the MLP posteriors are explored for clean speech and noisy speech at the frame level. Appropriate density functions are used to fit the softmax probability of the clean and noisy speech. A function that takes into account the ratio of the softmax probability density of noisy speech to clean speech is formulated. These phoneme independent scoring is weighted using a phoneme-specific weightage to make the scoring more robust. Simple thresholding is used to identify the noisy speech recording from the clean speech recordings. The approach is benchmarked on standard databases, with a focus on precision.

Keywords : noisy speech identification, speech pre-processing, noise robustness, feature engineering **Conference Title :** ICSTSP 2023 : International Conference on the Science and Technology of Speech Prosody **Conference Location :** Singapore, Singapore

Conference Dates : March 27-28, 2023