This document contains results obtained on a subset of network architectures using either MFSC (Mel-frequency spectral coefficients) or MFCC (Mel-frequency cepstral coefficients) as input feature to the network.

These helped us in the decision process to use MFSC rather than MFCC. In these experiments only the feature extraction was changed while everything else in the network remained fixed. Below some of the key results:

**Network 1)**

A DS-CNN network with 7 layers each with 76 filters. Note that the network trained with MFSC features are labelled as “log-mel” in the figure legend.

A close up of a map

Description automatically generated

Figure 1 Classification accuracy as a function of SNR. Results are shown with both noise types matching the training (matched) and noisy types not matching the training (mismatched). The network is a DS-CNN consisting of 7 layers with 76 filters per layer. MFSC features are labelled as log-mel

**Network 2)**

One of the DS-CNN architectures proposed by Zhang et al [1]. The network has 5 layers with 172 filters per layer.

A close up of a map

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Figure 2 Classification accuracy as a function of SNR. Result are shown only for noise types matching what was used during training. The network is a DS-CNN consisting of 5 layers with 172 filters per layer.

**Network 3)**

As reference a regular CNN was tested. The network consisted of 2 convolutional layers, each with 64 filters, followed by a fully connected layer. For this network 40 input features were used per timeframe

A close up of a map

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Figure 3 Classification accuracy as a function of SNR. Result are shown only for noise types matching what was used during training. The network is a CNN with 2 convolutional layers.

For all 3 network architectures, 2 DS-CNN and 1 regular CNN, it was found that using MFSC features outperformed MFCC.

1. Zhang, Y., Suda, N., Lai, L., Chandra, V.: Hello edge: Keyword spotting on microcontrollers. CoRR abs/1711.07128 (2017).1711.07128