Noise Classification Using Decision Comitee

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Abstract. *This is the paper model for SBC conferences. I made some instructions so we can use it to write our own paper. It contains a suggestion of placement of the sections.*
Ok here we make the abstract. Needless to say it comes last. Should have max 10 lines.

1. Introduction

I took some liberties in the sketch Nascimento gave us in the Telegram group, combining with this paper [Nakagawa et al. 2012] to come up with this model you're seeing. Initially, this Section describes the problem we are attempting to solve. We have to describe the problem many audio signal processing tasks face when performed in noisy conditions. References are much appreciated.

After that, we should write some kind of small version of the next sections. Do it ONLY after writing all the other parts. Each paragraph in the other sections become some lines here.

2. Audio Classification

In this section we should describe the audio classification task and how it applies to our specific problem, the noise classification.

Additionally, we have to describe each technique we use, in subsections.

2.1. Mel-Cepstral Coefficient Extraction

Here we talk about mel-cepstral coefficients and how to use them to identify each class of noise.

2.2. Neural Network

One or two paragraphs should do. Don't forget the proper references (like this one [Lei et al. 2014]).

2.3. K-means

This is a method used in summarization. Didn't find references.

2.4. Gaussian Mixture Models

This section describes the use of Gaussian mixture models (GMM) in the task of noise representation and classification. Here is a good journal article for further reference [Reynolds and Rose 1995].

2.5. Support Vector Machines

Here we have a paper in audio classification using SVM [Cumani and Laface 2012].

3. Experiments

Here we will describe the experiments. It should contain an introductory paragraph containing the purpose of the experiments.

3.1. Experimental Setup

This paragraph should have all the requirements to perform the experiment, including hardware, software and general conditions. Sometimes people put the database here, but i think it will provide greater value if we put it in it's own subsection.

3.2. Database Description

Here we describe the NOISEX database. Since it's an important part of this work, we should take our time to properly describe it.

3.3. Evaluation Metrics

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Here we can describe how we evaluate the performance of each experiment.

3.4. Results

You may be wondering why have only the 'results' and not the 'experiments' subsection. This is because we already told the reader everything he has to know in the previous sections. Section 2 describes the different methods and Sections 3.1 and 3.2 describe the details of the experiments.

Table 1. Model of confusion matrix PRA EU N TER Q FAZER ISSO DE NOVO

	Babble	Buccaneer 1	Buccaneer 2	Destroyer Engine	Destroyer Ops	F16	Factory 1	Factory 2	HF Channel	Leopard	M109	Machine Gun	Pink	Volvo	White
Babble															
Buccaneer 1															
Buccaneer 2															
Destroyer Engine															
Destroyer Ops															
F16															
Factory 1															
Factory 2															
HF Channel															
Leopard															
M109															
Machine Gun															
Pink															
Volvo															
White															

4. Conclusions

Here we conclude the paper. I suck at this, so pls someone do it for me. The one thing I know is that we have to summarize our findings and link it to our problem stated in the introduction, telling the reader whether we were successful or not in the task we proposed in the beginning.

Table 2. Accuracy per class for the K-means classification

Class	Accuracy
Babble	86,01%
Bucanneer 1	97,11%
Bucanneer 2	98,86%
Destroyer Engine	99,64%
Destroyer Ops	91,79%
F16	96,67%
Factory 1	59,06%
Factory 2	94,10%
HF Channel	100,00%
Leopard	98,69%
M109	93,89%
Machine Gun	7,45%
Pink	99,76%
Volvo	90,78%
White	99,95%

References

Cumani, S. and Laface, P. (2012). Analysis of large-scale svm training algorithms for language and speaker recognition. *IEEE Transactions on Audio, Speech, and Language Processing*, 20(5):1585–1596.

Lei, Y., Scheffer, N., Ferrer, L., and McLaren, M. (2014). A novel scheme for speaker recognition using a phonetically-aware deep neural network. In *Acoustics, Speech and Signal Processing (ICASSP), 2014 IEEE International Conference on*, pages 1695–1699. IEEE.

Nakagawa, S., Wang, L., and Ohtsuka, S. (2012). Speaker identification and verification by combining mfcc and phase information. *IEEE transactions on audio, speech, and language processing*, 20(4):1085–1095.

Reynolds, D. A. and Rose, R. C. (1995). Robust text-independent speaker identification using gaussian mixture speaker models. *IEEE transactions on Speech and Audio Processing*, 3(1):72–83.