Speaker Recognition in pattern recognition and machine learning.

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Abstract

The Content of this paper seeks to present the knowledge gained throughout the pattern recognition and machine learning course from Aarhus University, department of engineering. The paper is split into multiple sections explaining the data used in the paper, the methods used to treat the data and the methods used for categorising the data.

I. Introduction

The idea behind the project is to recognise the speaker using the methods and categorisers learned in the course pattern recognition and machine learning (TINONS). The voices of all authors was recorded and imported to matlab. The features from the data was extracted in matlab using the Mel-frequency cepstral coefficient(Hereafter MFCC) method from the voicebox toolbox. The MFCC's are used as features for the classifiers that are tested in this paper.

II. Data Gathering

How did we get data?

III. Feature Extraction

Introtext to MFCC

Math

How we use it

Intermediate result

IV. Features

Size and number of features and stuff.

V. Dimensionality Reduction

e.g. finding projection vectors, choosing number of components, applications.

I. PCA

Introtext

Math

How we use it or why we don't use it

Intermediate result

II. Fisher

Introtext

Math

How we use it or why we don't use it

Intermediate result

VI. Classifiers

Introtext to classifiers

I. Linear Classifier

e.g. cost/error function, dicision boundary and training method

Introtext

Math

How we use it or why we don't use it

Intermediate result

II. Probability Classifier

e.g. maximum likelihood, training/testing and generative vs. discriminative models.

Introtext

Math

How we use it or why we don't use it

Intermediate result

III. Artificial Neural Network Classifier

e.g. graphical network model, training method, model flexibility (expressive power)

Introtext

Math

How we use it or why we don't use it

Intermediate result

IV. EM Classifier

e.g. training method, cost functions, model order selection, initialisation of parameters.

Introtext

Math

How we use it or why we don't use it

Intermediate result

V. Sequential Models

Markov model and Hidden Markov Model.
e.g. meaning of parameters, left-to-right model, outline of training/testing method.

Introtext

Math

How we use it or why we don't use it

Intermediate result

VI. Support Vector Machines

e.g. decision function, support vectors, soft margins, kernel trick.

Introtext

Math

How we use it or why we don't use it

Intermediate result

VII. Results

Compare all the methods in a table in order to show the performance.

VIII. Discussion

I. Subsection One

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II. Subsection Two

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IX. Conclusion

References

[Figueredo and Wolf, 2009] Figueredo, A. J. and Wolf, P. S. A. (2009). Assortative pairing and life history strategy - a cross-cultural study. *Human Nature*, 20:317–330.