
Speech Recognition

- With Information Retrieval & Command Prompt -

Project Report
ED5-1-E17

Aalborg University
Electronics and IT

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Electronics and IT
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STUDENT REPORT

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Abstract:

This report goes into detail about the implementation of distributed speech recognition systems, information retrieval and machine learning. The main objective of the speech recognition system is to provide a handsfree human-computer interface experience, where the system is also able to handle noise.

The content of this report is freely available, but publication (with reference) may only be pursued due to agreement with the author.

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Todo list

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Preface

The project entitled Speech Recognition with Focus on information retrieval and command prompt was made by three students from the Electronics and Computer Engineering programme at Aalborg University Esbjerg, for the P5 project during the fifth semester.

Aalborg University, October 7, 2017

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Chapter 1

Introduction

Here is the introduction. The next chapter is chapter 1.
a new paragraph

1.1 Examples

You can also have examples in your document such as in example 1.1.

Example 1.1 (An Example of an Example)

Here is an example with some math

$$0 = \exp(i\pi) + 1 . \tag{1.1}$$

You can adjust the colour and the line width in the `macros.tex` file.

1.2 How Does Sections, Subsections, and Subsections Look?

Well, like this

1.2.1 This is a Subsection

and this

This is a Subsubsection

and this.

A Paragraph You can also use paragraph titles which look like this.

A Subparagraph Moreover, you can also use subparagraph titles which look like this. They have a small indentation as opposed to the paragraph titles.

Is it possible to add a subsubparagraph?

I think that a summary of this exciting chapter should be added.

Chapter 2

Problem Description

2.1 Problem Description

List to write about here:

- Main Objective/Goal
- What will be required
- How are we going to solve the Objective?

2.2 Problem Delimitation

To ensure that the project meets the desired scope, specific success criteria are formed which will be evaluated during the final stages of the report. The following list of requirements are the desired success criteria, where the focus will be on reaching the given goals.

- Create a network infrastructure for Client/Server Model
- Identify the system parameters (speech)
- Design a filter
- Detect and identify human speech
- Implement a speech recognition system with information retrieval

Brief summary on how are we going to obtain all of these bullet points.

Chapter 3

Distributed speech recognizer

3.1 The DSR system

3.2 Acoustic models

3.3 Language model

Chapter 4

Knowledge-based IR system

4.1 The document retrieval system

4.2 The question answering system

Chapter 5

Machine Learning

5.1 TensorFlow

TensorFlow provides multiple Application Programming Interfaces (APIs) for machine learning. The lowest level API "TensorFlow Core" provides complete programming control. For those who require fine levels of control over their models, TensorFlow Core is well-suited tool for the job. There are higher level APIs that are built on top of TensorFlow Core. These higher level APIs are typically easier to learn and use than Tensorflow Core In addition, the higher level APIs such as "tf.estimator" helps with managing data sets, estimators, training and inference (testing your trained network), as well as, making repetitive tasks easier and more consistent.

remember to cite here [https : //www.tensorflow.org/getting-started](https://www.tensorflow.org/getting-started)

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The subsection below, will start with TensorFlow Core. In order to gain understanding on the basic principles that TensorFlow has to offer, a model shall be made. In the subsection after that, the same model will be implemented with tf.estimator. Knowing TensorFlow Core principles will give us a great mental model of how things are working internally when we use the more compact higher level API.

5.1.1 Tensors

The central unit of data in TensorFlow is the tensor. A tensor consists of a set of primitive values shaped into an array of any number of dimensions. A tensor's rank is its number of dimensions. Here are some examples of tensors:

```
3 # a rank 0 tensor; this is a scalar with shape []
[1., 2., 3.] # a rank 1 tensor; this is a vector with shape [3]
[[1., 2., 3.], [4., 5., 6.]] # a rank 2 tensor; a matrix with shape [2, 3]
[[[1., 2., 3.]], [[7., 8., 9.]]] # a rank 3 tensor with shape [2, 1, 3]
```

5.1.2 TensorFlow Core**5.1.3 tf.estimator****5.2 Deep Learning****5.3 Recurrent Neural Network**

Chapter 6

Discussion

Chapter 7

Conclusion

In case you have questions, comments, suggestions or have found a bug, please do not hesitate to contact me. You can find my contact details below.

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Appendix A

Appendix A name

Here is the first appendix