A study on the Dik Universe

Development of a bigger dik

Darius Chira,Razvan Bucur,Titas Lasickas, Paulius Riauka
Electronics and Computer Engineering, TEPE4-1005fuk, 2018-08

Bachelor Project

STUDENT REPORT
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Here you can write something about which tools and software you have used for typesetting the document, running simulations and creating figures. If you do not know what to write, either leave this page blank or have a look at the colophon in some of your books.

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STUDENT REPORT

Electronics and IT
Aalborg University
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Title:
Project Title

Theme:
Digital Filtering

Project Period:
Fall Semester 2018

Project Group:
ED5-1-E18

Participant(s):
Darius Chira
Razvan Bucur
Titas Lasickas Paulius Riauka

Supervisor(s):
Daniel Ortiz-Arroyo

Copies: 1

Page Numbers: 25

Date of Completion:
November 20, 2018

Abstract:

Here is the abstract

Contents

Todo list

Preface

Here is the preface. You should put your signatures at the end of the preface.

Aalborg University, November 20, 2018

Author 1
<username1@XX.aau.dk>

Author 2
<username2@XX.aau.dk>

Author 3
<username3@XX.aau.dk>

Chapter 1

Introduction

Here is the introduction. The next chapter is chapter **??**.
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

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

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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 Analysis

2.1 Problem Description

2.2 Problem Delimitation

2.3 Initiating Problem

Chapter 3

Mathematical Analysis

3.1 Geometric Structure

Chapter 4

Development

4.1 Component List

4.1.1 Microphones characteristics

4.1.2 Measurements scenarios

4.1.3 Setup

4.2 Analog to digital conversion

Chapter 5

Noise Filtering

5.1 Research

5.1.1 Voice frequency analysis

Voice frequency ranges vary heavily depending on whether it sources from a male of a female. Fundamental voice frequency varies from 100Hz to 900 Hz for men and 350Hz to 3KHz for women. Including peaks to conserve natural sounding voice, a wider frequency range has to be considered. It rises to 8 KHz for males and 17KHz for females. [**Seaindia**]. Yet different researches often come up with different results. For example, in phone communications it is accepted to transmit frequency range between 400Hz and 3400Hz. This is the reason some peoples' voices transit poorly over the phone yet for most cases it work fine. This example allows to conclude that smaller frequency ranges could be acceptable. To conserve all of the properties of the human voice, filter boundaries should be around 100Hz to 17KHz but this range would filter out any noise as it takes up almost an entire frequency range of human hearing (approximately 20Hz to 20KHz).

5.1.2 Filtering characteristics

5.1.3 Results

Making a field researh to find the frequency range that would fit the needs of this project was out scope, therefore to test the filters it was decided to take trial-error approach. A few samples were made outside during a windy day. This was considered a good idea as it has recreated one of the most common conversation scenarios. At first it was attempted to conserve the entire frequency range that humans can produce. This has resulted in a filter that seemed to filter out a big part of the noise but if it was listened to, all of the previously recorded noise was still there.It was hard to tell the difference between filtered and not filtered sound

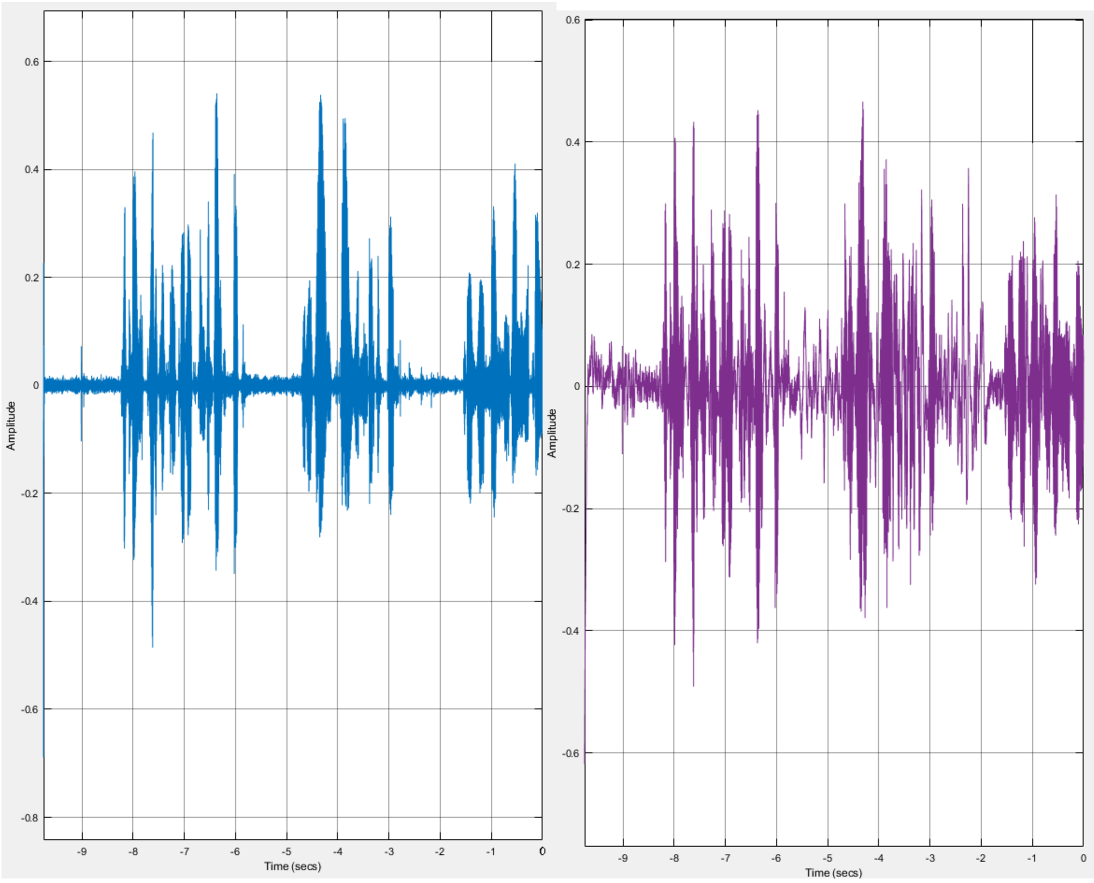

Figure 5.1: Filtered result on the left and recorded sample on the right

samples.

Chapter 6

Directional Noise Elimination

Chapter 7

Neural Network Speech Isolation

Chapter 8

Comparison

8.1 Synthetic Samples

8.2 Recorded Samples

8.3 Live events

8.4 Comparing all three methods and combining them

Chapter 9

Results

Chapter 10

Future Work

Chapter 11

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.

Jesper Kjær Nielsen
jkn@create.aau.dk
http://sqrt-1.dk
Audio Analysis Lab, CREATE
Aalborg University
Denmark

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[3] Tobias Oetiker. *The Not So Short A Introduction to LaTeX2e*. `http://tobi.oetiker.ch/lshort/lshort.pdf`. 2010.

Appendix A

Appendix A name

Here is the first appendix