

MASTER THESIS

Optimization of Neural Network

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for the degree of Engineer (Ing.)*

in the

DEPARTMENT OF
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Declaration of Authorship

I, Martin BULÍN MSc., declare that this thesis titled, “Optimization of Neural Network” and the work presented in it are my own. I confirm that:

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- I have acknowledged all main sources of help.

Signed:

Date:

“Look deep into nature, and then you will understand everything better.”

A. Einstein

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Abstract

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Optimization of Neural Network

by Martin BULÍN MSc.

abstract text...

Acknowledgements

acknowledgements text...

Contents

Abstract	iii
1 Introduction	1
1.1 State of the Art	1
1.2 Thesis Objectives	1
1.3 Thesis Outline	1
2 Methods	2
2.1 Network Pruning	2
2.2 Feature Selection	2
2.3 Network Visualization	2
2.4 Speech Data Gathering	2
3 Examples	3
3.1 2D-problem 1: XOR function	3
3.2 2D-problem 2: Unbalanced Features	3
3.3 2D-problem 3: Rule Plus Exception	3
3.4 Train Problem	3
3.5 Handwritten digits (MNIST)	3
3.6 Phonemes (speech data)	3
4 Discussion	4
4.1 Methods Recapitulation	4
4.2 Comparison of Pruning Methods	4
5 Conclusion and Outlook	5
Bibliography	6
A1 Structure of the Workspace	7
A2 Implementation	8
A3 Code Documentation	9

List of Figures

List of Tables

List of Abbreviations

AI	A rtificial I ntelligence
ANN	A rtificial N eural N etwork

Chapter 1

Introduction

Introduction text...

1.1 State of the Art

State of the art text... (Rosenblatt, 1958) (Reed, 1993)

1.2 Thesis Objectives

Thesis objectives text...

1.3 Thesis Outline

Thesis outline text...

Chapter 2

Methods

Methods intro text...

2.1 Network Pruning

Network pruning text...

2.2 Feature Selection

Minimal network structure text...

2.3 Network Visualization

Graphical user interface text...

2.4 Speech Data Gathering

Speech data classification text...

Chapter 3

Examples

results text...

3.1 2D-problem 1: XOR function

XOR data...

3.2 2D-problem 2: Unbalanced Features

Karnin data...

3.3 2D-problem 3: Rule Plus Exception

RPE data...

3.4 Train Problem

RPE data...

3.5 Handwritten digits (MNIST)

MNIST data... (LeCun and Cortes, 1998)

3.6 Phonemes (speech data)

PHONES data...

Chapter 4

Discussion

Discussion text...

4.1 Methods Recapitulation

Methods recapitulation text...

4.2 Comparison of Pruning Methods

Comparison of results text...

Chapter 5

Conclusion and Outlook

Conclusion text...

Outlook text...

Bibliography

- [1] Frank Rosenblatt. “The perceptron: A probabilistic model for information storage and organization in the brain”. In: *Psychological Review* 65 (1958), pp. 386–408.
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- [3] Yann LeCun and Corinna Cortes. *The MNIST database of handwritten digits*. 1998. URL: <http://yann.lecun.com/exdb/mnist/>.

Appendix A1

Structure of the Workspace

Appendix A2

Implementation

Appendix A3

Code Documentation