UNIVERSIDAD AUTÓNOMA DE MADRID

ESCUELA POLITÉCNICA SUPERIOR

Universidad Autónoma
de Madrid

Master in Deep Learning for
Audio and Video Signal Processing

MASTER THESIS

TITLE

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Resumen

Este Trabajo Fin de Master... (250-500 palabras).
The spanish summary is needed for the library.

Palabras clave

Palabra 1, Palabra 2,...

Abstract

This Master Thesis... (250-500 words).

Keywords

Word 1, Word 2,...

Acknoledgements

I would like to thank ...

Contents

List of Figures

List of Tables

Chapter 1

Introduction

1.1 Motivation

The motivation of this work is...

1.2 Objetivos

The objectives of this Master Thesis are...

1.3 Report structure

This report has the following chapters

- chapter 1 Introducción.
- chapter 2 Related work.
- chapter 3 Design and development.
- chapter 4 Evaluation.
- chapter 5 Conclusions and future work.

Chapter 2

Related work

2.1 Section 1

... Citation example: [**?**]

2.2 ...

...

Table 2.1: Sample table (long title)

Col1	Col2	Col2	Col3
1	6	87837	787
2	7	78	5415
3	545	778	7507
4	545	18744	7560
5	88	788	6344

Figure 2.1: Sample figure (long title).

Chapter 3

Design and development

3.1 Introduction

Concise introduction outlining approach, and purpose of modifying the activation function in the feedforward network and the expected impact of this modification.

Brief description of each subsection.

3.2 Network architectures

Reference fully detailed base networks' architectures on an appendix.

Explain why share the activation subnetwork among all the neurons (same as usual with ReLU, & lower complexity)(comment on potential of per-layer activations).

Explain activation subnetwork architecture. Including explanation of choice of base activation function (ReLU). Explain how in this setup the activation subnetwork is basically a piece-wise linear function. Comment on alternatives.

The ususal ReLU activation from the base models was replaced by a custom activation with learnable parameters. This new activation is shared among all the layers in the base model in the same way as a simple ReLU would. This means that there is only one set of parameters needed to define the activation function, and it is the same no matter where it is called from within the network. In this way, the complexity introduced by the new learnable parameters is kept to a minimum, and compared to the amount of trainable weights, it is usually negligible.

In order to potentially model any arbitrary activation function, a simple fully connected network was used, which we will refer to as (activation) subnetwork hereafter. The only requirement for a neural network to describe a function is that its input and output must be one-dimensional. Apart from that, there is complete freedom to define the architecture as one would please. For our purposes, we chose a network with a single hidden layer, and a ReLU activation. This architecture has the advantage of having a straightforward interpretation: it is a piece-wise linear function with as many pieces as the dimension of the hidden layer.

Mathematical description

3.3 Training process

Updating of parameters. Validation, loss function, etc.

3.4 Experimental setup

Actual experiments done. Description of datasets. Architectures tested. Multiple runs, to extract statistics.

Chapter 4

Evaluation

4.1 Section 1

...

4.2 ...

...

Chapter 5

Conclusions and future work

5.1 Conclusions

...

5.2 Future work

...

Appendix

Appendix A

Appendix-chapter 1