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# Hardware accelerator for Machine Learning

Erasmus Master's thesis in Computer science and engineering

Francesco Angione

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Department of Computer Science and Engineering  
CHALMERS UNIVERSITY OF TECHNOLOGY  
UNIVERSITY OF GOTHENBURG  
Gothenburg, Sweden 2020



MASTER'S THESIS 2020

# Hardware accelerator for Machine Learning

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Cover: Description of the picture on the cover page (if applicable)

# Abstract

Abstract text about your project in Computer Science and Engineering.

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# Acknowledgements

Here, you can say thank you to your supervisor(s), company advisors and other people that supported you during your project.

Francesco Angione, Gothenburg, March 2020





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# 1

## Introduction

This chapter presents the section levels that can be used in the template.

### 1.1 Section levels

The following table presents an overview of the section levels that are used in this document. The number of levels that are numbered and included in the table of contents is set in the settings file `Settings.tex`. The levels are shown in Section 1.2.

Name	Command
Chapter	<code>\chapter{<i>Chapter name</i>}</code>
Section	<code>\section{<i>Section name</i>}</code>
Subsection	<code>\subsection{<i>Subsection name</i>}</code>
Subsubsection	<code>\subsubsection{<i>Subsubsection name</i>}</code>

### 1.2 Section

#### 1.2.1 Subsection

##### 1.2.1.1 Subsubsection



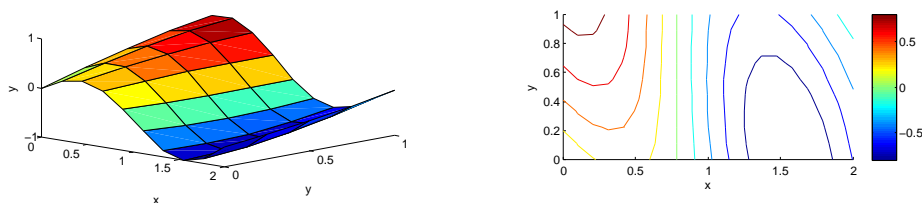


# 2

## Theory

In the following sections, examples of a figure, an equation, a table and a source code listing are shown.

### 2.1 Figure



**Figure 2.1:** Surface and contour plots showing the two dimensional function  $z(x, y) = \sin(x + y) \cos(2x)$ .

### 2.2 Equation

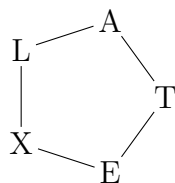
$$f(t) = \begin{cases} 1, & t < 1 \\ t^2 & t \geq 1 \end{cases} \quad (2.1)$$

### 2.3 Table

**Table 2.1:** Values of  $f(t)$  for  $t = 0, 1, \dots, 5$ .

$t$	0	1	2	3	4	5
$f(t)$	1	1	4	9	16	25

## 2.4 Chemical structure



## 2.5 Source code listing

### 2.5.1 Other alternatives to the Theory chapter

Sometimes, it is more appropriate to name this chapter Background.

At CSE, there exists a large span of different types of thesis works. Sometimes it is more appropriate to join the Theory and Methods chapters, sometimes the Theory chapter would be so small that it should be a subsection. Talk to your supervisor to find the most appropriate structure for your thesis.

# 3

## State of Art



# 4

## System Development

d

escribe the pynq enviromenrt and why we choose thaht

### 4.0.1 Hardware

### 4.0.2 System Level

### 4.0.3 Software

Methods text.



# 5

## Results

Describe you results. Use tables, diagrams etc. for illustration.





# 6

## Conclusion

You may consider to instead divide this chapter into discussion of the results and a summary.

### 6.1 Discussion

### 6.2 Conclusion



# Bibliography

- [1] Frisk, D. (2016) A Chalmers University of Technology Master's thesis template for L<sup>A</sup>T<sub>E</sub>X. Unpublished.

aaaa [1]

# A

## Appendix 1