Czech Technical University in Prague
Faculty of Information Technology
Department of Theoretical Computer Science

DISSERTATION THESIS TITLE

by

YOUR NAME

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Abstract and contributions

This dissertation thesis deals with ...

In particular, the main contributions of the dissertation thesis are as follows:

1. Design of a methodology of a ...
2. ...
3. ...

Keywords:
keyword1, keyword2, keyword3, keyword4, keyword5.

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Finally, my greatest thanks go to my family members, for their infinite patience and care ...

Dedication

. . .

Contents

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Abbreviations

Number Sets

$\mathbb{N}$	Natural numbers set
$\mathbb{N}_0$	Natural numbers set $\cup \{0\}$
$\mathbb{Z}$	Integer numbers set
$\mathbb{Z}_m$	Least nonzero residue number set with a module of m
$\mathbb{S}_m$	Symmetric residue number set with a module of m
$\mathbb{Q}$	Rational numbers set
$\mathbb{F}_t$	Floating point numbers set with a precision of t
$\mathbb{R}$	Real numbers set

Common Mathematical Functions and Operators

10_2	Numbers' radices are designated with a subscript
$\mathbf{b}$	Vector $\mathbf{b}$
b_i	the i^{th} element of vector $\mathbf{b}$
$\|\|\mathbf{b}\|\|$	Norm of vector $\mathbf{b}$
$\dim \mathbf{b}$	Dimension of vector $\mathbf{b}$
$\mathbf{A}$	Matrix $\mathbf{A}$
$a_{i,\,j}$	Element of matrix $\mathbf{A}$ at the i^{th} row, and the j^{th} column
$\mathbf{A}^{-1}$	Inverse matrix to matrix $\mathbf{A}$
$\mathbf{A}^T$	Transposed matrix to matrix $\mathbf{A}$
$\|\|\mathbf{A}\|\|$	Norm of matrix $\mathbf{A}$
$\operatorname{cond} \mathbf{A}$	Condition number of matrix $\mathbf{A}$
$\operatorname{rank} \mathbf{A}$	Rank of matrix $\mathbf{A}$ — how many independent rows/columns it has
$\max\{a,\, b\}$	Maximum of a and b, a when $a \geq b$, b when $a < b$
$\min\{a,\, b\}$	Minimum of a and b, a when $a \leq b$, b when $a > b$
$O(x)$	The big O notation
$\Theta(x)$	The big Θ notation

Mathematical Terminology

Q	Number of prime number modules
M	A product of individual modules $M = \prod_{i=1}^{Q} m_i$
...	...
...	...
...	...
...	...

Miscellaneous Abbreviations

FPU	Floating Point Unit
...	...
...	...
...	...
...	...

Chapter 1

Introduction

In this chapter, we...

1.1 Motivation

... [1] ...

1.2 Problem Statement

Brief description of the topic of the dissertation thesis. A complete explanation of the topic shall be described within chapter 2 at page 3.

1.3 Related Work/Previous Results

1.4 Goals of the Dissertation Thesis

1. ...
2. ...
3. ...

1.5 Structure of the Dissertation Thesis

The thesis is organized into ... chapters as follows:

1. *Introduction*: Describes the motivation behind our efforts together with our goals. There is also a list of contributions of this dissertation thesis.

2. *Background and State-of-the-Art*: Introduces the reader to the necessary theoretical background and surveys the current state-of-the-art.

3. *Overview of Our Approach*: ...

4. *Main Results*: ...

5. *Conclusions*: Summarizes the results of our research, suggests possible topics for further research, and concludes the thesis.

Chapter 2

Background and State-of-the-Art

...

2.1 Theoretical Background

2.2 Previous Results and Related Work

Chapter 3

Overview of Our Approach

The sample Fig. 3.1 shows ...

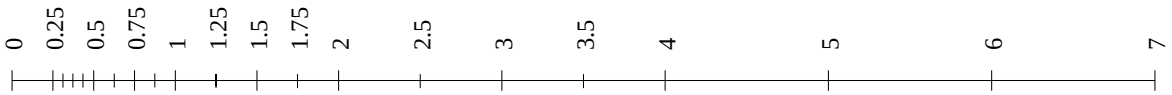

Figure 3.1: Distribution of the floating point numbers. This figure shows a distribution of a sample floating point number set with a precision $t = 3$, and $e_{min} = -1$ and $e_{max} = 3$.

There are two basic floating point data types , as defined by the IEEE 754-2008 [1] standard, are shown in Tab. 3.1.

	Sign [b]	**Exponent** [b]	**Mantissa** [b]	**Prec.** [dig]	**Total** [b]
binary32	1	8	24	8	32
binary64	1	11	53	16	64

Table 3.1: Basic floating point data types.

Chapter 4

Main Results

4.1 Main Result 1

4.2 Main Result 2

4.3 Main Result 3

Theorem 4.3.1. Some theorem...

Proof. Its proof... □

Corollary 4.3.2. The corollary is...

4.4 Discussion

4.5 Summary

Chapter 5

Conclusions

5.1 Summary

5.2 Contributions of the Dissertation Thesis

5.3 Future Work

The author of the dissertation thesis suggests to explore the following:

- It would be interesting to ...
- Consider ...
- The implementation of our methodology could be further improved ...
- Apply the ...
- ...

Bibliography

[1] IEEE Computer Society Standards Committee. *IEEE Standard for Floating-Point Arithmetic*. ANSI/IEEE STD 754-2008., The Institute of Electrical and Electronics Engineers, Inc., 2008, 58 pp.

Reviewed Publications of the Author Relevant to the Thesis

[1] Gortz, R.; Tölökö, F. On the Carpathian Castle. In: *Transylvanian Journal of ...*. Werst, Romania, 2010.

The paper has been cited in:

- Nováků, Š. Carpathian Castle Revealed. *International Symposium on Carpathian Legends*. 1:319–323, 2010.

Remaining Publications of the Author Relevant to the Thesis

[1] Gortz, R. *MINIMUM TITLE*. Ph.D. Minimum Thesis, Faculty of Information Technology, Prague, Czech Republic, 2010.

The paper has been cited in:

- Léfèvre, Ç. *Le Château des Carpathes : Le fin alternatif découvert !*, ...
- Q. Mañana. ...
- H. Erdős. ...
- Å. Sørenson. ...

Remaining Publications of the Author

[1] Gortz, R. Another publication. *36th International Conference on ....* pp. 19–24, Štrbské pleso, Slovak Republic, 2010.

Appendix A

Some appendix

A.1 ...

Section not in the Table of Contents