My department or research center

DOCTORAL THESIS

"The fabulous name of my thesis"

Presented by

Mr. Ángel Auñón

Supervised by

Dr. Supervisor 1

Dr. Supervisor 2

Dr. Supervisor 3

My city, October 2020

DOCTORAL THESIS

``*The fabulous name of my thesis''*

Presented by: Mr. Ángel Auñón
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THESIS EXAMINERS

Dr. examiner 1
Dr. examiner 2
Dr. examiner 3

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Chairman: Dr. Wonderful Chairman
Secretary: Dr. Awesome Secretary
Member: Dr. Incredible Member

My city, October 2020

Abstract

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

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Keywords: keyword1; keyword2; keyword3; keyword4;

Abstract (another language)

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List of publications

This thesis is based on the work presented in the following papers:

1 Full publication 1 `\fullcite`

2 Full publication 2 `\fullcite`

3 Full publication 3 `\fullcite`

4 Full publication 4 `\fullcite`

Division of work between authors

The work leading up to this thesis was done in collaboration with other researchers...

Acknowledgments

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My city, Month Year.

“Why not just use a thesis template and focus on creating the content?”

— Angel Auñón

Contents

List of Tables

List of Figures

List of symbols

Latin characters

A	Area
a	Speed of sound
c_p	Isobaric specific heat capacity
c_v	Isochoric specific heat capacity
Δx	Cell size
D	Diameter
e_t	Specific total internal energy
f	Frequency
h	Heat transfer coefficient
T	Temperature
t	Time
u	Flow speed
v	Absolute speed
V	Cell volume
w	Relative speed
x	Axial coordinate

Greek characters

α	Absolute flow angle
β	Relative flow angle
Δ	Interval, distance
η	Efficiency
γ	Specific heat capacities ratio
λ	Eigenvalue
ν	CFL number
π	Pressure ratio
ρ	Density

σ	Blade speed ratio

Sub- and Superscripts

conv	Convection
eff	Effective
env	Environment
exp	Experimental data
i	Cell number
limit	Limit value
min	Minimum
model	Model results

Acronyms

0D	Zero-dimensional
1D	One-dimensional
CFD	Computational fluid dynamics
CFL	Courant-Friedrichs-Lewy condition
CPU	Central processing unit

Chapter 1

The first chapter

Contents

1.1 First section of chapter 1

This is how you can create a fancy capital letter at the beginning of each chapter or section, just use `\letr{First letter word}{rest of the letters}`, e.g. `\letr{T}{his}`

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

1.2 Second section of chapter 1

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language.

There is no need for special content, but the length of words should match the language.

- First item in a list
- Second item in a list
- Third item in a list
- Fourth item in a list
- Fifth item in a list

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

1.2.1 This a subsection

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

1.2.1.1 This is a subsubsection

This is a subsubsection in subsection 1.2.1 Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

Now I am going to cite this book [1].

Chapter 1 References

[1] A smart guy. *The great and imaginary book of LaTeX templates*. 2020 (cit. on p. 4).

Chapter 2

The second chapter

Contents

2.1 First section of chapter 2

Here I am going to insert a picture of my cat.

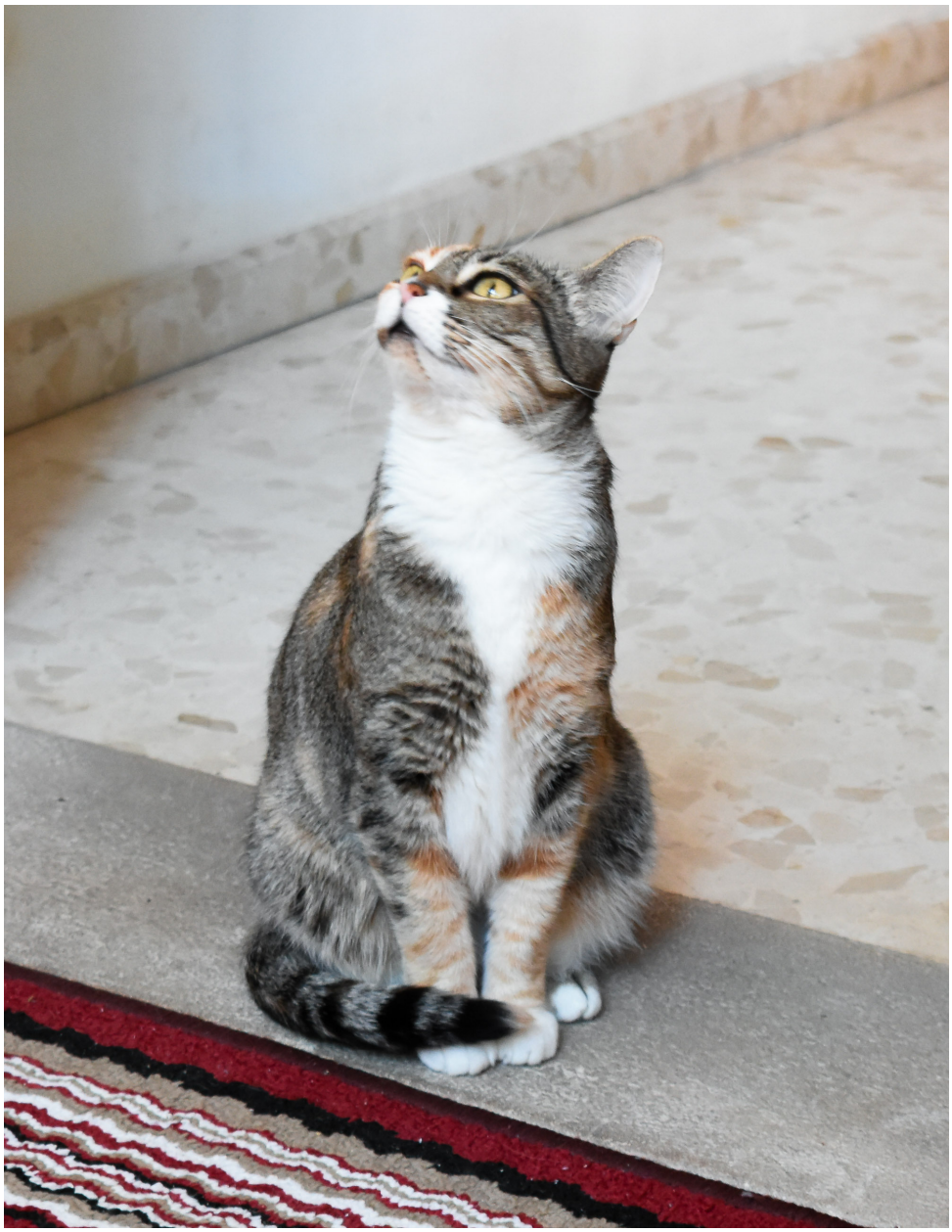

Figure 2.1: *She is Greta.*

Some maths!

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha)+\cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a}\cdot\sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{i=n} x_i = \frac{x_1 + x_2 + \ldots + x_n}{n}$$

Hello, here is some text without a meaning. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sin^2(\alpha) + \cos^2(\beta) = 1$. This text should contain all letters of the alphabet and it should be written in of the original language $E = mc^2$. There is no need for special content, but the length of words should match the language. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$.

$$\int_0^\infty e^{-\alpha x^2}\mathrm{d}x = \frac{1}{2}\sqrt{\int_{-\infty}^{\infty} e^{-\alpha x^2}\mathrm{d}x \int_{-\infty}^{\infty} e^{-\alpha y^2}\mathrm{d}y} = \frac{1}{2}\sqrt{\frac{\pi}{\alpha}}$$

Hello, here is some text without a meaning. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. This text should show what a printed text will look like at this place. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$. If you read this text, you will get no information. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

$\sin^2(\alpha) + \cos^2(\beta) = 1.$

$$\sum_{k=0}^{\infty} a_0 q^k = \lim_{n\to\infty} \sum_{k=0}^{n} a_0 q^k = \lim_{n\to\infty} a_0 \frac{1-q^{n+1}}{1-q} = \frac{a_0}{1-q}$$

Hello, here is some text without a meaning $E = mc^2$. This text should show what a printed text will look like at this place. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. If you read this text, you will get no information. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. There is no need for special content, but the length of words should match the language.

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-p \pm \sqrt{p^2 - 4q}}{2}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha)+\cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

$$\frac{\partial^2\Phi}{\partial x^2} + \frac{\partial^2\Phi}{\partial y^2} + \frac{\partial^2\Phi}{\partial z^2} = \frac{1}{c^2}\frac{\partial^2\Phi}{\partial t^2}$$

Hello, here is some text without a meaning. $\mathrm{d}\Omega = \sin\vartheta \mathrm{d}\vartheta \mathrm{d}\varphi$. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sin^2(\alpha) + \cos^2(\beta) = 1$. This text should contain all letters of the alphabet and it should be written in of the original language $E = mc^2$. There is

no need for special content, but the length of words should match the language. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$.

2.2 Second section of chapter 2

Another citation [2]

And a table, using my font for displaying numbers.

Letter	*Type*	*Value*
A	vowel	23
D	consonant	35
F	consonant	66
J	consonant	41
O	vowel	20

Table 2.1: A table using two fonts.

Chapter 1 References

[1] A smart guy. *The great and imaginary book of LaTeX templates*. 2020 (cit. on p. 4).

Bibliography

[1] A smart guy. *The great and imaginary book of LaTeX templates*. 2020 (cit. on p. 4).

[2] A. Auñón. "How you can use a thesis template?" *Non-real journal* 1.1 (2020), pp. 1–20. url: https://github.com/victor-aunon/Thesis-template (cit. on p. 11).

“Miau, miau, miau.”

— Greta