

# **MASTER THESIS**

Thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Engineering at the University of Applied Sciences Technikum Wien - Degree Program Mechatronics/Robotics

**Arbeitstitel**

**Arbeitstitel**

By: Halil Pamuk, BSc

Student Number: 51842568

Supervisor: Sebastian Rauh, MSc. BEng

Wien, February 7, 2024

# Declaration

“As author and creator of this work to hand, I confirm with my signature knowledge of the relevant copyright regulations governed by higher education acts (see Urheberrechtsgesetz /Austrian copyright law as amended as well as the Statute on Studies Act Provisions / Examination Regulations of the UAS Technikum Wien as amended).

I hereby declare that I completed the present work independently and that any ideas, whether written by others or by myself, have been fully sourced and referenced. I am aware of any consequences I may face on the part of the degree program director if there should be evidence of missing autonomy and independence or evidence of any intent to fraudulently achieve a pass mark for this work (see Statute on Studies Act Provisions / Examination Regulations of the UAS Technikum Wien as amended).

I further declare that up to this date I have not published the work to hand nor have I presented it to another examination board in the same or similar form. I affirm that the version submitted matches the version in the upload tool.“

Wien, February 7, 2024

Signature

# Kurzfassung

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.

**Schlagworte:** Schlagwort1, Schlagwort2, Schlagwort3, Schlagwort4

# 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.

**Keywords:** Keyword1, Keyword2, Keyword3, Keyword4

# Contents

<b>1 Erste Überschrift der Ebene 1 (chapter)</b>	<b>1</b>
<b>2 Heading on Level 0 (chapter)</b>	<b>1</b>
2.1 Heading on Level 1 (section) . . . . .	1
2.1.1 Heading on Level 2 (subsection) . . . . .	1
2.2 Lists . . . . .	2
2.2.1 Example for list (itemize) . . . . .	2
2.2.2 Example for list (enumerate) . . . . .	3
2.2.3 Example for list (description) . . . . .	3
2.3 Erste Überschrift Tiefe 2 (section) . . . . .	5
2.3.1 Erste Überschrift Tiefe 3 (subsection) . . . . .	5
<b>3 Zweite Überschrift der Tiefe 1 (chapter)</b>	<b>6</b>
3.1 Zweite Überschrift Tiefe 2 (section) . . . . .	6
3.2 Zweite Überschrift Tiefe 2 (section) . . . . .	7
3.2.1 Zweite Überschrift Tiefe 3 (subsection) . . . . .	7
3.2.2 Dritte Überschrift Tiefe 3 (subsection) . . . . .	7
<b>4 Dritte Überschrift der Tiefe 1 (chapter)</b>	<b>9</b>
<b>Bibliography</b>	<b>11</b>
<b>List of Figures</b>	<b>13</b>
<b>List of Tables</b>	<b>14</b>
<b>List of Code</b>	<b>15</b>
<b>List of Abbreviations</b>	<b>16</b>
<b>A Anhang A</b>	<b>17</b>
<b>B Anhang B</b>	<b>18</b>

# 1 Erste Überschrift der Ebene 1 (chapter)

## 2 Heading on Level 0 (chapter)

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.

### 2.1 Heading on Level 1 (section)

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.

#### 2.1.1 Heading on Level 2 (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.

### **Heading on Level 3 (subsubsection)**

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.

**Heading on Level 4 (paragraph)** 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.

## **2.2 Lists**

### **2.2.1 Example for list (itemize)**

- 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

### **Example for list (4\*itemize)**

- First item in a list
  - First item in a list
    - \* First item in a list
      - First item in a list
      - Second item in a list
    - \* Second item in a list
  - Second item in a list

- Second item in a list

### 2.2.2 Example for list (enumerate)

1. First item in a list
2. Second item in a list
3. Third item in a list
4. Fourth item in a list
5. Fifth item in a list

#### Example for list (4\*enumerate)

1. First item in a list
  - a) First item in a list
    - i. First item in a list
      - A. First item in a list
      - B. Second item in a list
    - ii. Second item in a list
  - b) Second item in a list
2. Second item in a list

### 2.2.3 Example for list (description)

**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

#### Example for list (4\*description)

**First** item in a list

**First** item in a list

**First** item in a list



**First** item in a list

**Second** item in a list

**Second** item in a list

**Second** item in a list

**Second** 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.

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

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.

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

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.

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

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.

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

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. 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.

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

Hello, here is some text without a meaning. 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.

## 2.3 Erste Überschrift Tiefe 2 (section)

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.

### 2.3.1 Erste Überschrift Tiefe 3 (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.

#### **Erste Überschrift Tiefe 4 (subsubsection)**

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.

## **3 Zweite Überschrift der Tiefe 1 (chapter)**

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.

### **3.1 Zweite Überschrift Tiefe 2 (section)**

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.

## 3.2 Zweite Überschrift Tiefe 2 (section)

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.

### 3.2.1 Zweite Überschrift Tiefe 3 (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.

### 3.2.2 Dritte Überschrift Tiefe 3 (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.

#### **Zweite Überschrift Tiefe 4 (subsubsection)**

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.

Querverweise werden in  $\text{\LaTeX}$  automatisch erzeugt und verwaltet, damit sie leicht aktualisiert werden können. Hier wird zum Beispiel auf Abbildung 1 verwiesen.

**Einstein Albert 2008**

Figure 1: Beispiel für die Beschriftung eines Buchrückens.

**Einstein Albert 2008**

Figure 2: 2. Beispiel für die Beschriftung eines Buchrückens.

Und hier ist ein Verweis auf Tabelle 1. Das gezeigte Tabellenformat ist nur ein Beispiel. Tabellen können individuell gestaltet werden.

Table 1: Semesterplan der Lehrveranstaltung „Angewandte Mathematik“.

Datum	Thema	Raum
20.08.2008	Graphentheorie	HS 3.13
01.10.2008	Biomathematik	HS 1.05

Table 2: 2. Semesterplan der Lehrveranstaltung „Angewandte Mathematik“.

Datum	Thema	Raum
20.08.2008	Graphentheorie	HS 3.13
01.10.2008	Biomathematik	HS 1.05

Hier wird auf die Formel 1 verwiesen.

$$x = -\frac{p}{2} \pm \sqrt{\frac{p^2}{4} - q} \quad (1)$$

$$x = -\frac{p}{2} \pm \sqrt{\frac{p^2}{4} - q} \quad (2)$$

```

1 #include <iostream>
2
3 void SayHello(void)
4 {
5     // Kommentar
6     cout << "Hello_World!" << endl;
7 }
8
9 int main(int argc, char **argv)
10 {
11     SayHello();
12     return 0;

```

## Code 1: 1. Beispiel

Literaturverweise sollten automatisch verwaltet werden, vor allem, wenn es viele Quellenverweise gibt. Beispiele sind [8], [9], [2], [13], [4], [6], [14], [3], [11], [12], [7], [1], [5], [10]. Das verwendete Zitierformat (bzw. das Format des Literaturverzeichnisses) ist entsprechend der Vorgaben der Studiengänge zu wählen. Es wird dringend empfohlen, BibTeX zu verwenden (wie in diesem Beispiel).

## 4 Dritte Überschrift der Tiefe 1 (chapter)

**Einstein Albert 2008**

Figure 3: 3. Beispiel für die Beschriftung eines Buchrückens.

**Einstein Albert 2008**

Figure 4: 4. Beispiel für die Beschriftung eines Buchrückens.

Table 3: 3. Semesterplan der Lehrveranstaltung „Angewandte Mathematik“.

Datum	Thema	Raum
20.08.2008	Graphentheorie	HS 3.13
01.10.2008	Biomathematik	HS 1.05

Table 4: 4. Semesterplan der Lehrveranstaltung „Angewandte Mathematik“.

Datum	Thema	Raum
20.08.2008	Graphentheorie	HS 3.13
01.10.2008	Biomathematik	HS 1.05

$$x = -\frac{p}{2} \pm \sqrt{\frac{p^2}{4} - q} \quad (3)$$

$$x = -\frac{p}{2} \pm \sqrt{\frac{p^2}{4} - q} \quad (4)$$

```

1 #include <iostream>
2
3 void SayHello(void)
4 {
5     // Kommentar
6     cout << "Hello_World!" << endl;
7 }
8
9 int main(int argc, char **argv)
10 {
11     SayHello();
12     return 0;
13 }

```

Code 2: 2. Beispiel

# Bibliography

- [1] Atmel Corporation. *Atmel ATmega16 – 8-bit Microcontroller with 16K Bytes In-System Programmable Flash*. San Jose, United States: Atmel Corporation, 2011. URL: [http://www.atmel.com/dyn/resources/prod%5C\\_documents/doc2466.pdf](http://www.atmel.com/dyn/resources/prod%5C_documents/doc2466.pdf).
- [2] Michel Goossens, Frank Mittelbach, and Alexander Samarin. *Der LaTeX Begleiter*. Bonn: Addison-Wesley Deutschland, 2002.
- [3] H. Hemetsberger. *AIT Stereo Sensor im Einsatz während der DARPA Urban Challenge 2007*. AIT Austrian Institute of Technology, 2007.
- [4] M. Humenberger, D. Hartermann, and W. Kubinger. "Evaluation of Stereo Matching Systems for Real World Applications Using Structured Light for Ground Truth Estimation". In: *Proceedings of the Tenth IAPR Conference on Machine Vision Applications (MVA2007)*. Tokyo, Japan: MVA Conference Committee, 2007, pp. 433–436.
- [5] Martin Humenberger. *Real-Time Stereo Matching for Embedded Systems in Robotic Applications*. Wien: Technische Universität Wien, Fakultät für Elektrotechnik und Informationstechnik, 2011.
- [6] Martin Humenberger et al. "A fast stereo matching algorithm suitable for embedded real-time systems". In: *Computer Vision and Image Understanding* 114.11 (2010), pp. 1180–1202.
- [7] International Standards Office. *ISO 690 – Information and documentation: Bibliographical references: Electronic documents*. Genf: International Standards Office, 1998.
- [8] Helmut Kopka. *LaTeX, Band 1: Einführung*. 3rd ed. München: Pearson Studium, 2005.
- [9] Helmut Kopka. *LaTeX, Band 1: Einführung*. 3rd ed. München: Pearson Studium, 2005. URL: <http://www.pearson-studium.de>.
- [10] Johannes Pohn. *Condition Monitoring Systeme für die zustandsorientierte Instandhaltung von Windkraftanlagen*. Wien: FH Technikum Wien, Masterstudiengang Innovations- und Technologiemanagement, 2010.
- [11] Siemens Automation Technology. *SIMATIC*. 2011. URL: <http://www.automation.siemens.com/mcms/topics/de/simatic/Seiten/Default.aspx>.
- [12] Siemens Automation Technology. *SIMATIC*. [Online] Verfügbar unter: <http://www.automation.siemens.com/mcms/topics/de/simatic/Seiten/Default.aspx> [Zugang am 17.10.2014]. 2014.



- [13] Susanne Teschl, Karl Michael Göschka, and Günter Essl. *Leitfaden zur Verfassung einer Bachelorarbeit oder Master Thesis*. FH Technikum Wien, 2014. URL: [www.technikum-wien.at](http://www.technikum-wien.at).
- [14] Christian Zinner, Wilfried Kubinger, and Richard Isaacs. "Pfelib: a performance primitives library for embedded vision". In: *EURASIP Journal on Embedded Systems* 2007 (2007), pp. 1–14. URL: <http://downloads.hindawi.com/journals/es/2007/049051.pdf>.

[12]

## List of Figures

Figure 1	Beispiel für die Beschriftung eines Buchrückens. . . . .	8
Figure 2	2. Beispiel für die Beschriftung eines Buchrückens. . . . .	8
Figure 3	3. Beispiel für die Beschriftung eines Buchrückens. . . . .	9
Figure 4	4. Beispiel für die Beschriftung eines Buchrückens. . . . .	9

## List of Tables

Table 1	Semesterplan der Lehrveranstaltung „Angewandte Mathematik“ . . . . .	8
Table 2	2. Semesterplan der Lehrveranstaltung „Angewandte Mathematik“ . . . . .	8
Table 3	3. Semesterplan der Lehrveranstaltung „Angewandte Mathematik“ . . . . .	9
Table 4	4. Semesterplan der Lehrveranstaltung „Angewandte Mathematik“ . . . . .	9

## List of Code

Code 1 1. Beispiel . . . . .	8
Code 2 2. Beispiel . . . . .	10

# List of Abbreviations

**ABC**    Alphabet

**WWW**    world wide web

**ROFL**    Rolling on floor laughing

## A Anhang A

## B Anhang B