

BACHELOR PAPER

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

Titel der Arbeit

By: Titel Vorname Name, Titel

Student Number: XXXXXXXXXXXXXXXXX

Supervisor: Titel Vorname Name, Titel

Wien, August 19, 2025

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, August 19, 2025

Digital 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

1 Erste Überschrift der Ebene 1 (chapter)	1
2 Heading on Level 0 (chapter)	1
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
3 Zweite Überschrift der Tiefe 1 (chapter)	6
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
4 Dritte Überschrift der Tiefe 1 (chapter)	8
Bibliography	10
List of Figures	12
List of Tables	13
Documentation table of AI-based tools	14
List of Abbreviations	15
A Anhang A	16
B Anhang B	17

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 \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.

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

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

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

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

4 Dritte Überschrift der Tiefe 1 (chapter)

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

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

Bibliography

- [1] H. Kopka, *LaTeX, Band 1: Einführung*, 3rd ed. München: Pearson Studium, 2005.
- [2] H. Kopka, *LaTeX, Band 1: Einführung*, 3rd ed. München: Pearson Studium, 2005. Accessed: Jul. 6, 2011. [Online]. Available: <http://www.pearson-studium.de>
- [3] M. Goossens, F. Mittelbach, and A. Samarin, *Der LaTeX Begleiter*. Bonn: Addison-Wesley Deutschland, 2002.
- [4] S. Teschl, K. M. Göschka, and G. Essl, *Leitfaden zur Verfassung einer Bachelorarbeit oder Master Thesis*, FH Technikum Wien, 2014. Accessed: Aug. 4, 2014. [Online]. Available: www.technikum-wien.at
- [5] 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.
- [6] M. Humenberger, C. Zinner, M. Weber, W. Kubinger, and M. Vincze, "A fast stereo matching algorithm suitable for embedded real-time systems," *Computer Vision and Image Understanding*, vol. 114, no. 11, pp. 1180–1202, 2010.
- [7] C. Zinner, W. Kubinger, and R. Isaacs, "Pfelib: A performance primitives library for embedded vision," *EURASIP Journal on Embedded Systems*, vol. 2007, pp. 1–14, 2007. Accessed: Jul. 6, 2011. [Online]. Available: <http://downloads.hindawi.com/journals/es/2007/049051.pdf>
- [8] H. Hemetsberger, *Ait stereo sensor im einsatz während der darpa urban challenge 2007*, AIT Austrian Institute of Technology, 2007.
- [9] Siemens Automation Technology. "Simatic," Accessed: Jul. 6, 2011. [Online]. Available: <http://www.automation.siemens.com/mcms/topics/de/simatic/Seiten/Default.aspx>
- [10] Siemens Automation Technology. "Simatic," Accessed: Oct. 17, 2014. [Online]. Available: <http://www.automation.siemens.com/mcms/topics/de/simatic/Seiten/Default.aspx>
- [11] International Standards Office, *Iso 690 – information and documentation: Bibliographical references: Electronic documents*, Genf: International Standards Office, 1998.
- [12] Atmel Corporation, *Atmel atmega16 – 8-bit microcontroller with 16k bytes in-system programmable flash*, San Jose, United States: Atmel Corporation, 2011. Accessed: Jul. 6, 2011. [Online]. Available: http://www.atmel.com/dyn/resources/prod%5C_documents/doc2466.pdf

- [13] M. Humenberger, "Real-time stereo matching for embedded systems in robotic applications," Dissertation, Technische Universität Wien, Fakultät für Elektrotechnik und Informationstechnik, Wien, 2011.
- [14] J. Pohn, "Condition monitoring systeme für die zustandorientierte instandhaltung von windkraftanlagen," Diplomarbeit, FH Technikum Wien, Masterstudiengang Innovations- und Technologiemanagement, Wien, 2010.

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

Documentation table of AI-based tools

AI-Based Tool	Intended Use	Prompt, Source, Page, Paragraph. . .
DeepL Translate	Translation of an article in English	Source (XXX), Chapter X on page X-X
Chat GPT 4.0	Grammar and Spelling	"Please list issues with spelling and grammar in the following text: ..." Entire document

List of Abbreviations

ABC Alphabet

WWW world wide web

ROFL Rolling on floor laughing

A Anhang A

B Anhang B