APPROVED
Approved at the VUAS FoIT Council meeting
on December 19, 2022
Decision No. 22-15-01

Approved with amendments
at the VUAS FoIT Council meeting
on March 31, 2026
Decision No. 26-04-07

VENTSPILS UNIVERSITY OF APPLIED SCIENCES
FACULTY OF INFORMATION TECHNOLOGIES

REGULATIONS ON THE METHODOLOGICAL GUIDELINES FOR THE PREPARATION AND DEFENSE OF FINAL THESES

1. GENERAL PROVISIONS

The purpose of these methodological guidelines is to familiarize students with the requirements for final theses, their development, formatting, defense procedures, and evaluation according to unified criteria.

These methodological guidelines also define the competence of the Faculty of Information Technologies dean's office administration in the administration process of final theses.

The Faculty dean's office administration (study administrator, study methodologist, Dean) ensures only the formal and administrative compliance of final theses with the established requirements.

The Faculty dean's office administration is not responsible for the methodology used in the final thesis, the research content, selected technologies, interpretation of results, or scientific quality. Responsibility for these aspects lies with the author and the scientific supervisor.

At the Faculty of Information Technologies of Ventspils University of Applied Sciences, the following final theses are provided:

- Qualification thesis
- Bachelor's thesis
- Master's thesis

A **Qualification thesis** is an independently implemented programming-related project defended before the State Examination Commission. It certifies the student's competence for the Qualification "Programmer".

A **Bachelor's thesis** is an independently implemented project in computer science or electronics, defended before the Final or State Examination Commission. It certifies competence for obtaining a Bachelor's degree.

A **Master's thesis** is an independently implemented research project in computer science or electronics, defended before the Final or State Examination Commission. It certifies competence for obtaining a Master's degree.

Stages of final (Qualification, Bachelor's, Master's) thesis development:

- Selection of supervisor and topic (see Appendix No. 1);
- Formulation of aim and objectives;
- Problem analysis and selection of possible solutions;
- Implementation of tasks using efficient technologies;
- Evaluation and analysis of obtained results;
- Formatting of the thesis;
- Defense of the final thesis.

2. STRUCTURE, VOLUME, AND CONTENT OF THE THESIS

The final thesis has the following structure:

- Title page (see Appendix No. 2);
- Abstracts (see Appendix No. 3);
- Table of contents (see Appendix No. 4);
- Introduction;
- List of abbreviations and symbols (if necessary);
- Main body;
- Conclusions and proposals;
- List of references (see Appendix No. 5);
- Appendices;
- Declaration (see Appendix No. 6).

Recommended length of the thesis in computer typesetting (excluding appendices):

Qualification Thesis	30-50 pages;
Bachelor's Thesis	up to 60 pages;
Master's Thesis	up to 80 pages.

The indicated length is recommendatory, not mandatory, and may vary depending on the topic and complexity.

Optimal structure of the final thesis (% of total volume):

Introduction	3–5 %;
Main body	80–85 %;
Conclusions and Recommendations	3–5 %.

2.1. Abstract

An abstract must be prepared for the final thesis in Latvian and English (each up to 1 page). The abstract provides a general overview of the research area and briefly summarizes the main results obtained. The abstract must include the title of the thesis, the author, the supervisor, the total number of pages, tables, figures, and appendices. The target audience of the thesis must be indicated. The abstract must include 3–5 keywords representing the main concepts that characterize its topic and essence. If the results of the thesis have been published or presented at conferences, this information must be included in the abstract, indicating where it can be found. The abstract must be written in such a way that it can be used independently of the rest of the thesis (see Appendix No. 3).

2.2. Introduction

The introduction is a structured concept of the thesis providing a general overview of the research problem.

It should include:

- Justification of topic relevance
- Aim of the thesis
- Objectives
- Review of existing solutions
- Structure of the thesis
- Scope limitations (if necessary)
- Methods and technologies used

2.3. List of Abbreviations and Symbols

The list of abbreviations and symbols used in the thesis shall be presented on a separate page. If there are fewer than 10 abbreviations and symbols, they may also be explained within the text.

2.4. Main Body of the Thesis

The purpose of the main body is to provide, in a systematic manner, a theoretical and practical justification of the problem under study. The main body is divided into chapters. Chapters of large scope are preferably divided into subchapters. The number of chapters and subchapters is not regulated and depends on the scope and content of the thesis. To avoid fragmentation, each subchapter should be at least one page long.

The thesis begins with a review of literature and sources, summarizing comparisons of different theories and factual material that form the basis for the analysis of the problem. In this section, based on multiple literature sources, the research problem must be analyzed, and the main theoretical principles forming the foundation of the thesis must be described. These principles serve as the basis for the author's development (e.g., principles, formulas, functional boundaries of the solution, etc.). It is recommended to clarify the understanding of terms and concepts used in the thesis by describing their context. Referring to literature sources, an overview of similar developments by other authors must be provided, including their parameters, advantages, and disadvantages. During the analysis, the author must not rely solely on the opinions and findings of other authors; the thesis must also include the author's own evaluations and conclusions regarding the problem under study. The study of literature and information sources is of great importance in this part. In the development of a Qualification thesis, it is necessary to describe and justify the technologies used in the practical part, thereby including an analysis of comparable technologies.

The most significant part of the thesis is the **practical section**, in which the author, based on the information validated in the theoretical part about the research object, demonstrates a practical implementation of the object under study.

Development of a Software Solution
(e.g., an information system, mobile application, game, etc.)

In the practical part, it is necessary to create and describe the developed solution:

- **Requirements definition.** Functional and non-functional requirements are described.
- **System design**, including:
    - the software architecture model;
    - the database model (e.g., using entity–relationship diagrams);

- **System development** (the implementation of the system is described);
- **Evaluation of quality indicators**, which includes, for example, test development, calculation of test coverage, and the results provided by the software quality assessment tools used.

Development of an Electronic Device or System

When developing an electronic device or system, the final thesis must describe the following development stages and their results:

- **Requirements definition.** Technical requirements and other considerations that determine the system architecture are described.
- **Architecture design.** The architecture model of the device or system is described in the form of a block diagram at a level of detail sufficient to initiate system development.
- **Detailed design.** A detailed description of the system is provided (e.g., schematic diagrams, software or embedded software descriptions, etc.), according to the specifics of the topic.
- **Implementation.** The process of creating a real electronic device or system (prototype) is described.
- **Verification.** The performed measurements and tests are described, analyzing and comparing the obtained results with the initially defined technical requirements.

2.5. Conclusions and Proposals

Conclusions and proposals constitute the final part of the thesis and are of great importance in the defense of the thesis. Each conclusion and proposal shall be written in a separate paragraph. Conclusions and proposals must be written in the form of theses.

Conclusions must reflect the most important findings derived from the research. They must be directly related to the aim and objectives of the thesis. Conclusions must highlight the innovations obtained during the research, as well as their practical significance, demonstrating the author's contribution to the study of the specific research problem. Conclusions must follow from the content of the thesis and be substantiated by the most important data and facts presented in the thesis. In the conclusions, the author must demonstrate that the aim of the thesis has been achieved and the objectives have been fulfilled. Citations from other authors' works are not permitted in the conclusions.

Proposals must be justified and must follow from the research conducted and the conclusions drawn in the thesis. Proposals must be specific, well-founded, and practically implementable. They must not contradict one another. Proposals must not be formulated in a vague or overly general manner. The proposals summarize the recommendations for solving the problem substantiated in the thesis.

2.6. List of References

The list of references includes all literature, documents, and other sources (including internet sources) used in the development of the thesis. The list of references must be formatted according to the IEEE (Institute of Electrical and Electronics Engineers) bibliographic citation style. When compiling the list, the accepted order of references must be followed—sources must be arranged in the order in which they are cited in the thesis: the first cited source is assigned number one, the second number two, and so on.

For books, the following information must be provided: the author's initials and surname, the title of the book, place of publication, publisher, year of publication, and the number of pages (ISBN, if available). If a work has two or three authors, their surnames are listed in

the order given in the book, separated by commas. If a work has more than three authors, it is permitted to list the first three followed by the abbreviation “et al.”. If the book is a collection of articles or a work by multiple authors, it is included in the list according to the first letter of its title. After the title, the editor should be indicated (e.g., “edited by ...”).

Internet materials, journal articles, and newspaper articles are included in the general list by indicating the author, article title, journal or newspaper title, year of publication, issue number, and page numbers where the article is published. For internet sources, the date of access must be indicated (see Appendix No. 5).

Books

[Reference number] Author’s initials. Author’s surname, Book title, edition (if not the first). Place of publication: Publisher, Year of publication. Number of pages.

[1] I.A. Glover and P.M. Grant, *Digital Communications*, 3rd ed. Harlow: Prentice Hall, 2009, pp. 192–217.

E-Books

[Reference number] Author’s initials. Author’s surname. (Year, Month, Day). Book title, edition (if not the first). [Online]. Available: URL [Accessed: DD.MM.YYYY.]

[3] W. Zeng, H. Yu, C. Lin. (2013, Dec 19). *Multimedia Security Technologies for Digital Rights Management* [Online]. Available: http://goo.gl/xQ6doi [Accessed: Nov. 14, 2022.]

Note: If the e-book is a direct equivalent of a printed book (e.g., in PDF format), it may be cited as a regular printed book.

Journal Article (including scientific publications indexed in journals)

[Reference number] Author's initials. Author's surname. "Article title," Journal title, volume number, issue number, page numbers, abbreviated month, year.

[3] F. Yan, Y. Gu, Y. Wang, C. M. Wang, X. Y. Hu, H. X. Peng, et al., "Study on the interaction mechanism between laser and rock during perforation," *Optics and Laser Technology*, vol. 54, pp. 303–308, Dec. 2013.

Note: The above example is from a journal that does not use issue numbers; therefore, they are not included in the reference.

E-journal Article (including scientific publications indexed in journals)

Note: PDF versions of journal articles are direct copies of the printed version and may therefore be cited as printed journal articles.

[Reference number] Author's initials. Author's surname. (Month, Year). "Article title," Journal title [Online]. Volume number, issue number, page numbers (if available). Available: URL [Accessed: Month Day, Year]

[3] M. Semilof. (1996, July). "Driving commerce to the web-corporate intranets and the internet: lines blur." *Communication Week* [Online]. vol. 6, issue 19. Available: http://www.techweb.com/se/directlinkcgi?CWK19960715S0005 [Accessed: Nov. 14, 2022]

Standards

[Reference number] Standard title, standard number, date.

[9] *Shunt power capacitors*, IEEE standard 18-2012, 2013.

Internet Sources

Note: Include as much essential information as possible about the website. If the webpage does not have a personal author, the website name may be used.

[Reference number] Author's initials. Author's surname. (Year, Month, Day). Title of the online source. [Online]. Available: URL [Accessed: Month Day, Year]

[13] BBC News. (2013, Nov. 11). *Microwave signals turned into electrical power* [Online]. Available: http://www.bbc.co.uk/news/technology-24897584 [Accessed: Nov. 14, 2022]

[14] M. Holland. (2002). *Guide to citing internet sources* [Online]. Available: http://www.bournemouth.ac.uk/library/using/guide_to_citing_internet_sourc.html [Accessed: Nov. 14, 2022]

2.7. Appendices

Appendices include documents and informational data that are too detailed or extensive to be included in the main text. Documents included in the appendices must be completed. The appendices shall contain materials used as research instruments, extensive analytical calculations, large tables used in the calculations presented in the thesis, instructions, technical data, and other relevant materials. If the results of the thesis have been presented at a conference, a document certifying participation or a copy thereof must be included in

the appendices.

The code developed in the practical part must be stored in a repository server (e.g., *GitHub, GitLab, gitlab.venta.lv*, etc.), and a hyperlink to the student's project repository on the selected server must be included in the appendices.

3. TECHNICAL FORMAT OF THE THESIS

In study programmes implemented in the Latvian language, final theses must be written in the state language in accordance with the rules of Latvian orthography. In study programmes implemented in English, the final thesis must be written and defended in English. If the thesis is prepared during a study mobility period, it may be submitted in English, accompanied by a summary in Latvian (a shortened version of the thesis, preserving the structure of the thesis; the introduction, conclusions, and recommendations must be fully translated).

The thesis must be prepared using a computer. The page format is A4. The main text must use font size 12 (*Times New Roman / Tinos* or another metrically compatible font), chapter headings must use size 16 (**BOLD**, uppercase letters), and subchapter headings must use size 14 (**Bold**, lowercase letters). Line spacing is 1.5. Page margins must be as follows: top, bottom, and right margins – 20 mm; left margin – 35 mm. The first line of each paragraph must have an indentation of 1.27 cm. Line spacing must be 1.

The thesis may also be formatted using *LaTeX*, aligning the technical formatting as closely as possible with the requirements stated above.

The thesis must be written in a formal literary language, taking into account the following requirements:

- The presentation of the material must be precise, clear, logical, and specific.
- Each new chapter must start on a new page, while subchapters are written as a continuation of the previous text, separated by a single blank line before the next subheading.
- Each chapter must be numbered (using Arabic numerals) and titled. Subchapters must also be numbered in relation to the chapter number and include a title.
- The titles of chapters and subchapters must exactly correspond to those listed in the table of contents. No full stop is placed after headings in the text.
- The use of the pronoun "I" is not desirable; for example, instead of "I believe" or "in my opinion," formulations such as "the author believes" or "it will be examined" should be used. The thesis should be written in a way that clearly distinguishes the author's views from those of other researchers.
- Page numbers must be placed in the bottom right corner of each page using Arabic numerals. Page numbers are not shown on the title page and the table of contents page, but these pages are included in the total page count.
- The use of quotations, numerical data, figures, formulas, etc. from published works, as well as the use of other authors' conclusions and adapted ideas (paraphrased), must be properly referenced with citations.

3.1. Table Formatting

For better clarity, the information used in the thesis may be presented in tables. Each table

must be assigned a sequential number within the chapter. Tables are numbered using two numbers in Arabic numerals, where the first number indicates the chapter number and the second indicates the table's sequential number within that chapter. The number is written above the table on the right-hand side. Each table must have a title corresponding to its content, which is written above the table, below the number.

Table 3.1.

Title of the Table

The table must be placed in the thesis immediately after its first reference in the text. Explanations of the table's content and the conclusions drawn from it must always be included in the text. The interpretation of the data presented in the table is the author's responsibility. For tables that are borrowed from other sources, the source of the table must be indicated. The source reference is provided as a citation.

3.2. Formatting of Figures

All illustrations—such as diagrams, charts, maps, etc.—are referred to as figures. They are inserted into the thesis after their first mention in the text. Figures must be placed in the text in a way that ensures they are clearly visible and easy to read in the normal reading direction or by rotating the page 90° clockwise if necessary.

Figures are numbered using Arabic numerals within each chapter. For example, Figure 3.1, where the first number indicates the chapter number and the second indicates the sequential number of the figure within that chapter. Each figure must have an appropriate title, which is written below the figure, centred on the same line as the figure number. For figures that are borrowed from other sources, the source of the figure must be indicated. The source reference is provided as a citation.

Figure 1.1. Title of the Figure

3.3. Formatting of Formulas

When referring to a formula in the text, its number is indicated in parentheses, for example: "using formula (3.1) …". If necessary, the explanation of the formula should include the units of each symbol. The unit of measurement for the same parameter must remain consistent throughout the entire thesis.

For example: the relative frequency or proportion of a characteristic is calculated using formula 3.1 (source):

Mathematically, Newton's law of cooling can be expressed as:

$$\frac{dT}{dt} = -k(T - Ta),$$

(3.1.)

where

$T = T(t)$ – temperature of the body as a function of time,
Ta – ambient temperature,
$k^{(k > 0)}$ – cooling coefficient

3.4. Inclusion of Program Code in the Thesis's Description

Code fragments may be included in the thesis's description to improve the clarity and visual representation of important ideas or implementations described in the thesis, for example when presenting key algorithms related to the topic of the thesis. Program code may be included in the main text if the code fragment does not exceed half a page. Otherwise, it must be included in the appendices. Code should be formatted using font size 10 (Consolas or Courier New). The program code must be presented as a code block enclosed in a frame with a 0.5 pt border. Each code fragment is numbered using Arabic numerals within each chapter. For example, Code Fragment 3.1, where the first number indicates the chapter number and the second indicates the sequential number of the code fragment within that chapter. Each code fragment must have an appropriate title, which is written below the code block, centered on the same line as the number.

```
      @Override
      public UserPrincipal login(String username, String password) {
                  final  UserDetails  userDetails                                    =
userDetailsService.loadUserByUsername(username);
             final  UsernamePasswordAuthenticationToken
usernamePasswordAuthenticationToken = new UsernamePasswordAuthenticationToken(
                                                    userDetails, password,
                         userDetails.getAuthorities());

authenticationManager.authenticate(usernamePasswordAuthenticationToken);


                         if
             (usernamePasswordAuthenticationToken.isAuthenticated())

SecurityContextHolder.getContext().setAuthentication(usernamePasswordAuthenticat
ionToken);

             return (UserPrincipal) userDetails;
      }
```

Code Fragment 3.1. **User Authentification using the Spring Security Framework**

3.5. Referencing

References to other authors' original ideas, arguments, conclusions, or stated facts, as well as direct or paraphrased quotations whose authors are identifiable, must be included in any research work. A reference is not required for a generally known idea or expression whose author is not identifiable and which can be considered common knowledge. In cases of uncertainty regarding the need for a reference, a reference should always be provided. A quotation must be placed in quotation marks. If any changes are made to the quoted text, they must be clearly indicated. A minor change of individual words in another author's text does not grant the right to present the text as one's own. In cases of indirect citation, both the original author of the idea and the author of the source from which it was taken must be indicated. References must also be provided when the author uses their own previously published work.

References are indicated in square brackets in accordance with the IEEE citation style. The square brackets contain the sequential number of the source in the bibliography, for example [5]. When referring to multiple sources, each source is placed in separate brackets, for example [5] [8].

Several Examples of IEEE-style citations:

"…as shown by A. Brown [4], as noted previously."

"The theory was first proposed in 1987 [1]."

"For example, see [7]."

"Several recent studies [3, 4, 15, 16] indicate that…"

The above example may also be formatted as follows:

"Several recent studies [3], [4], [15], [16] indicate that…"

If a source is directly quoted or refers to a specific part of a source, page numbers must be indicated in square brackets, for example [1, p. 15] or [2, pp. 23–24].

3.6. Use of Artificial Intelligence Tools

During the development of the final thesis, the student must ensure independent academic work, critical analysis of information, and formulation of conclusions.

Generative artificial intelligence tools (e.g., text or image generation tools) must not be used as a primary source for creating academic content. Such tools may only be used as auxiliary aids, for example, for improving text style, structuring ideas, or preparing visual materials.

If generative artificial intelligence tools have been used in the development of the thesis, this must be indicated at the end of the thesis, after the list of references, by including a declaration on the use of generative artificial intelligence tools.

Declaration on the Use of Generative Artificial Intelligence Tools

In the preparation of this _____ (Qualification / Bachelor's / Master's thesis), the author has used the following generative artificial intelligence tools:

Purpose of use: _____

Tool: _____ (name, model or version, source)

Reference to section(s) in the thesis: _____

Purpose of use: _____

Tool: _____ (name, model or version, source)

Reference to section(s) in the thesis: _____

Purpose of use: _____

Tool: _____ (name, model or version, source)

Reference to section(s) in the thesis: _____

The author has reviewed and edited the content generated or modified by generative artificial intelligence tools and assumes full responsibility for the accuracy, correctness, and compliance of the information included in the thesis with the principles of academic integrity.

If, during plagiarism check, the control system detects a substantial similarity between the text and other sources or the author's own previously submitted academic theses, and the matching text segments are not properly referenced (e.g., similarity exceeding 15% with another author's work or exceeding 30% with the author's own previously submitted work), the thesis is forwarded for additional evaluation. If an academic integrity violation is confirmed during the evaluation, the State or Final Examination Committee decides on applicable sanctions.

If, during the assessment using the tools applied by Ventspils University of Applied Sciences, indications are found that may suggest the use of generative artificial intelligence in the creation of the thesis content, the thesis is forwarded for additional evaluation. If an academic integrity violation is confirmed during the evaluation, the State or Final Examination Committee decides on applicable sanctions.

3.7. Submission of the Final Thesis

Theses are prepared in accordance with methodological guidelines and submitted in electronic form within the deadline set by the faculty via the university's designated study information system.

The thesis must be submitted as a single PDF file containing all parts of the thesis (title page, declaration, table of contents, main body, references, and appendices). The PDF file

name must follow the format: surname_firstname1firstname2_studentID, using Latin alphabet letters without diacritical marks, numbers, and underscores (_), without spaces. The submitted electronic file is considered the official version of the thesis.

The final thesis must be submitted electronically for defense. If necessary, the thesis must be submitted together with the developed product. If the thesis includes a software solution (e.g. information system, mobile application, game, etc.), the student must additionally submit a video demonstration showing the functionality of the developed solution. The video file must be submitted together with the electronic version of the thesis.

The submission process to the Faculty of Information Technologies Dean's office is as follows:

1. The student submits the final thesis electronically in the LAIS system no later than the deadline specified in the annual academic calendar.
2. Each thesis is forwarded to the faculty study methodologist, who checks compliance with formal formatting requirements and administrative correctness. If formal or administrative deficiencies are identified, the thesis may be returned to the student for correction, which must be completed within 2 days.
3. After verification, the thesis is forwarded to the plagiarism detection system.
4. No later than seven days before the defense, the faculty study administrator submits eligible theses to supervisors and reviewers. The supervisor prepares a written evaluation within four days and submits it to the faculty dean's office electronically or as a signed hard copy. The reviewer prepares a review within four days and submits it in the same manner. The reviewer has the right to invite the student to provide clarifications regarding the thesis. The faculty study administrator sends the review to the respective student. The student is entitled to familiarise themselves with the comments and questions included in the review before the defense.
5. After receiving the supervisor's evaluation and the reviewer's report, the thesis is submitted to the dean, who decides whether it is approved for defense. The dean informs the faculty study administrator which theses are permitted to proceed to defense.

Students whose theses contain methods or results related to commercial confidentiality have the right, at least one week before submission, to submit an application to the Faculty of Information Technologies requesting confidentiality of the thesis. This includes requesting a closed session of the Final / State Examination Committee, non-deposition in the library, and non-disclosure to third parties (see Appendix No. 9).

The faculty study administrator, study methodologist, and dean do not evaluate the scientific content or quality of the thesis. The scientific quality is assessed by the supervisor, reviewer, and the Final or State Examination Committee.

4. DEFENSE AND EVALUATION OF THE FINAL THESIS

The procedure for defending the final thesis in accordance with the regulations of the Final Examination Committee (FEC) or State Examination Committee (SEC) is as follows:

- presentation by the candidate on the results of the completed thesis;
- review report by the reviewer (see Appendix No. 7);
- answers to the questions raised by the reviewer;
- answers to questions from members of the FEC or SEC;

- answers to questions from other attendees;
- supervisor's evaluation of the final thesis (see Appendix No. 8).

After all candidates have defended their theses, a committee meeting is held for evaluation of the theses. Following the meeting, the results are announced.

The defense of the final thesis is conducted in Latvian. Students of vocational study programmes and bachelor's study programmes deliver a 10-minute presentation, while master's students deliver a 15-minute presentation, in which they justify the relevance of the topic, present the aim of the thesis, briefly describe its content, and summarise the conclusions and recommendations. Special emphasis must be placed on the author's own contribution and originality.

The evaluation of the final thesis takes into account:

- quality of the thesis: correspondence between title and content, logical structure, and formatting;
- presentation skills and the author's report (ability to present the research scientifically, concisely, and in a reasoned manner, formulate conclusions, and demonstrate the quality of illustrative material);
- answers to committee questions, reviewer comments, and ability to engage in discussion.

Appendix No. 1

EXAMPLE

To the Dean of the Faculty of Information Technologies
of Ventspils University of Applied Sciences
(position, academic degree, first name, last name)

Ventspils University of Applied Sciences
Faculty of Information Technologies
Short-cycle / First-cycle / Second-cycle study programme
"Title of the study programme"
Year X student

_____
(first name, last name)

_____
(personal identification number)

APPLICATION

For approval of the Qualification / Bachelor's / Master's thesis topic and appointment of a supervisor

I hereby request approval of the topic of my Qualification / Bachelor's / Master's thesis:

_____

_____
(in Latvian)

_____

_____
(in English)

and the appointment of my Qualification / Bachelor's / Master's thesis supervisor: ____.
(academic title – degree, first name, last name)

Agreed: _____
(supervisor's signature)

_____
(student's signature)

_____
(date)

The topic and supervisor have been approved at the FoIT Council meeting on _____, decision No. _____

Dean of the Faculty (position, academic degree, first name, last name) _____
(signature)

_____
(date)

Appendix No. 2

EXAMPLE

Ventspils *year*

VENTSPILS UNIVERSITY OF APPLIED SCIENCES

FACULTY OF INFORMATION TECHNOLOGIES

QUALIFICATION / BACHELOR'S / MASTER'S THESIS

TITLE OF THE THESIS

Author

Ventspils University of Applied Sciences

Faculty of Information Technologies

Short-cycle / First-cycle / Second-cycle study programme

"Title of the study programme"

Year X student

FIRST NAME LAST NAME

Student ID No. _____

Supervisor

position, academic degree
first name, last name

Reviewer

position, academic degree
first name, last name

Ventspils *year*

EXAMPLE

ABSTRACT

Title of the Thesis: Development of a New Image Segmentation Method

Author: Jānis Bērziņš

Supervisor: Dr. math. Kārlis Kļaviņš

Length of the Thesis: 90 pages, 10 tables, 9 figures, 40 bibliogrāphic references, 6 appendices.

Keywords: IMAGE SEGMENTATION, ALGORITHMS, IMAGE ENHANCEMENT

The thesis examines several existing image segmentation algorithms and the shortcomings of these methods. In addition, various image enhancement techniques are described, which can be applied to improve the quality of image segmentation results.

For the development of a new segmentation method, several algorithms are proposed, including segmentation algorithms and image enhancement techniques independently developed by the author of the thesis. A software tool has been created for the analysis of the algorithms, which allows comparison of the proposed methods, and an evaluation of these algorithms has been carried out.

A new image segmentation method has been developed in the thesis, which combines both image enhancement techniques and the developed algorithms. A program has been created to study and evaluate the performance of the new method, which significantly facilitates this process.

CONTENTS

EXAMPLE

EXAMPLE

LIST OF REFERENCES AND SOURCES

1. I.A. Glover and P.M. Grant, *Digital Communications*, 3rd ed. Harlow: Prentice Hall, 2009, pp. 192–217.

2. W. Zeng, H. Yu, C. Lin, "Multimedia Security Technologies for Digital Rights Management," Dec. 19, 2013 [Online]. Available: http://goo.gl/xQ6doi [Accessed Nov. 14, 2022].

3. F. Yan, Y. Gu, Y. Wang, C. M. Wang, X. Y. Hu, H. X. Peng, et al., "Study on the interaction mechanism between laser and rock during perforation," *Optics and Laser Technology*, vol. 54, pp. 303–308, Dec. 2013.

4. M. Semilof, "Driving commerce to the web—corporate intranets and the internet: lines blur," *Communication Week*, vol. 6, no. 19, July 1996 [Online]. Available: http://www.techweb.com/se/directlinkcgi?CWK19960715S0005 [Accessed Nov. 14, 2022].

5. J. Augucēvičs, J. Ozols, E. Treiguts, *Computer Science: Exercises and Solutions*, Riga: Biznesa augstskola Turība, 2002, 179 pp. ISBN 9984-609-95-2.

6. D. Lieģeniece, I. Nazarova, *A Holistic Approach to Language Acquisition for Children Aged 5–7*, Riga: RaKa, 1999, 112 pp.

7. M. Harts, I. Selberga, M. Stefana et al., *The Natural World*. Trans. J. Bitenieks; ed. M. Kusiņa. Riga: Zvaigzne ABC, 2003, 193 pp.

8. E. Karnītis, "Information society – opportunities for everyone," *E-pasaule*, Nov. 2002 [Online]. Also available in the printed edition *e-pasaule*. Available: http://www.dtnet.lv/00602613 [Accessed Mar. 18, 2003].

9. BBC News, "Microwave signals turned into electrical power," Nov. 11, 2013 [Online]. Available: http://www.bbc.co.uk/news/technology-24897584 [Accessed Nov. 14, 2022].

Declaration on the Use of Generative Artificial Intelligence Tools

In the preparation of this _____ (Qualification / Bachelor's / Master's thesis), the author has used the following generative artificial intelligence tools:

Purpose of use: _____

Tool: _____ (name, model or version, source)

Reference to section(s) in the thesis: _____

Appendix No. 6

EXAMPLE

DECLARATION

I, _____ *(first name, last name):*

1) hereby certify that this work has been independently completed by me as an original piece of work. All sources of information used in this work, as well as the data and definitions taken from them, have been indicated in the work. This work has not been submitted for assessment in any other examination and has not been published.

I have been informed that this work will be submitted to and processed in a computerized plagiarism detection system for the purpose of plagiarism control.

2) agree / do not agree *(cross out the unnecessary option)*, that Ventspils University of Applied Sciences may, free of charge, place and store this work in the Digital Library collection *Academia* managed by the National Library of Latvia (https://digitalabiblioteka.lv/), where it will be accessible both to library users and on the global internet, in such a way that it can be accessed individually by any person at a time and place of their choosing.

Submission of the work in the electronic study environment is considered the author's confirmation that the information provided in this declaration is true.

Appendix No. 7

EXAMPLE

FACULTY OF INFORMATION TECHNOLOGIES

VENTSPILS UNIVERSITY OF APPLIED SCIENCES

Street Inženieru 101, Ventspils, LV-3601 **phone:** +371 636 29654 **e-mail:** ITF@venta.lv

QUALIFICATION / BACHELOR'S / MASTER'S THESIS REVIEW

For the Short-cycle / First-cycle / Second-cycle study programme "Title of the study programme"

Student: _____
(last name, first name)

Qualification / Bachelor's / Master's thesis:

Qualification / Bachelor's / Master's thesis evaluation: _____
(grade in numbers and words)

Positive aspects of the Qualification / Bachelor's / Master's thesis:

_____

_____

_____

_____

Main shortcomings of the Qualification / Bachelor's / Master's thesis:

_____

_____

_____

_____

Overall evaluation of the Qualification / Bachelor's / Master's thesis:

_____

_____

_____

_____

Reviewer's questions:

Reviewer:

(position, academic degree, last name, first name)

(signature)

In Ventspils, _____, 20__

Appendix No. 8

EXAMPLE

FACULTY OF INFORMATION TECHNOLOGIES

VENTSPILS UNIVERSITY OF APPLIED SCIENCES

Street Inženieru 101, Ventspils, LV-3601 **phone:** +371 636 29654 **e-mail:** ITF@venta.lv

_____(___)

Evaluation: in words (with grade)

Short-cycle / First-cycle / Second-cycle study programme

"Title of the study programme"

Year X student

Date of defense _____.____.____.

_____

(first name, last name)

SUPERVISOR'S REPORT ON THE QUALIFICATION / BACHELOR'S / MASTER'S THESIS

Supervisor: _____

Qualification / Bachelor's / Master's thesis topic: _____

Volume: __ pp. Number of tables: __. Number of figures: __. Number of appendices __.

Description of the structure and content of the Qualification / Bachelor's / Master's thesis: _____

_____

_____

_____

_____

Strengths and valuable aspects of the Qualification / Bachelor's / Master's thesis: _____

_____

_____

_____

Weaknesses of the Qualification / Bachelor's / Master's thesis:

Level of independence in the development of the Qualification / Bachelor's / Master's thesis:

Degree of achievement of the Qualification / Bachelor's / Master's thesis objective (circle the appropriate):

up to 50% from 50% to 75% above 75%

Overall evaluation of the Qualification / Bachelor's / Master's thesis:

In Ventspils, _____, 20__

(signature)

Appendix No. 9

EXAMPLE

To the Dean of the Faculty of Information Technologies
of Ventspils University of Applied Sciences
(position, academic degree, first name, last name)

Ventspils University of Applied Sciences
Faculty of Information Technologies
Short-cycle / First-cycle / Second-cycle study programme
"Title of the study programme"
Year X student

_____
(first name, last name)

_____
(personal identification number)

APPLICATION

Regarding the confidentiality of the Qualification / Bachelor's / Master's thesis

Due to the fact that the methods and results described in the Qualification / Bachelor's / Master's thesis are related to a trade secret, I request that the defense of my Qualification / Bachelor's / Master's thesis be held in a closed session of the Final / State Examination Commission, that the thesis not be submitted to the library, and that it not be distributed to third parties.

Agreed _____
(signature of the Qualification / Bachelor's / Master's thesis supervisor)

_____
(student's signature)

_____
(date)

Dean of the Faculty (position, academic degree, name, surname) _____
(signature)

_____
(date)