

Ministry of Education of the Republic of Belarus
Educational institution
Belarusian State University of
Informatics and Radioelectronics

УДК

AUTHOR'S SURNAME
Author's Name

Добавлено примечание ([k1]): The universal decimal classification (Russian: УДК) is a system for classifying information. The UDC is widely used all over the world for systematization of works of science, literature and art, periodicals, various types of documents. According to the UDC, one can understand the type of literature without reading it. A UDC index is an obligatory element of the publication's imprint. According to ГОСТ Р 7.0.4-2006 «Editions. Imprints» a UDC index should be put in the upper left corner of the title page turnover. Many scientific journals require a UDC index for publishing the paper. For self-determination of UDC indices, you can use the online classifier (free access), for example: UDC Handbook – <http://teacode.com/online/udc/>
Must be agreed with the supervisor

TITLE OF THESIS

Thesis
for a Master's Degree
in the Specialty 1-45 80 01 Infocommunication Systems and Networks

Добавлено примечание ([k2]): Master's signature

Supervisor
Supervisor's Degree, Title
Supervisor's Full Name

Добавлено примечание ([k3]): Supervisor's signature

Minsk 2021

||

Добавлено примечание ([PW4]): Reverse side of the title page

Normocontroller

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Добавлено примечание ((B.V.1)): Between the name TABLE OF CONTENTS and the content itself, leave a gap equal to a space line.

Добавлено примечание ((B.V.2)): In the table of contents, each heading is connected by a dot leader with a page number.

Добавлено примечание ((B.V.3)): In the table of contents, each heading is connected by a dot leader with a page number

Добавлено примечание ((ПW4)): Slides of your presentation

Добавлено примечание ((B.V.5)): The dissertation pages are numbered in Arabic numerals in the lower right corner or in the center. The title page is included in the general pagination, but the page number is not put on it. The general pagination includes all appendixes and graphic material.

LIST OF ABBREVIATIONS, SYMBOLS AND TERMS

API	– Application Programming Interface;
CRM	– Customer relation management;
DML	– Data manipulation language;
REST	– Representational State Transfer;
SOAP	– Simple Object Access Protocol;
SOQL	– Salesforce object query language;
SSD	– Solid-State Drive;
VMM	– Virtual machine monitor;
VoIP	– Voice over Internet Protocol;
WAN	– Wide area network;
XML	– Extensible Markup Language.

GENERAL DESCRIPTION OF WORK

Relevance of the subject

The work corresponds to paragraph 6 «*Ensuring the safety of man, society, state*» of the State Program of innovative development of the Republic of Belarus for 2021–2025. The work was carried out in the educational institution Belarusian State University of Informatics and Radioelectronics.

Добавлено примечание ((ПВ1)): the number and name of the paragraph of innovative development is to be clarified with the supervisor

The aim and tasks of the work

The aim of the work is

To achieve this aim, the following tasks were solved in the dissertation:

- 1.
- 2.
3. etc.

Personal contribution of the author

The content of the dissertation reflects the personal contribution of the author. It consists in the scientific substantiation of *names* algorithms (methods, software tools, etc.), setting and conducting experiments to study characteristics, assessing the efficiency of the developed algorithms, processing and analyzing the obtained results, formulation of conclusions.

Task setting and discussion of the results were carried out together with the supervisor *degree, title Full Name*.

Добавлено примечание ((ПВ2)): Described according to the work done in the dissertation

Testing and implementation of results

The main provisions and results of the dissertation work were reported and discussed at:

The results of the thesis are used in scientific and technical products of *full name of the organization*.

Добавлено примечание ((К3)): The list of conferences and seminars where the dissertation work was presented in written form and \ or in the form of a report is indicated

Author's publications

According to the results of the research presented in the dissertation, ___ author's works was published, including: ___ articles in scientific journals recommended by the Higher Attestation Commission, with a total amount of 3.5 author's pages; ___ articles and abstracts in conference proceedings.

Добавлено примечание ((К4)): The quantity and quality of author's publications are indicated

Structure and size of the work

The dissertation work consists of introduction, general description of the work, four chapters with conclusions for each chapter, conclusion, bibliography, eight appendixes.

The total amount of the thesis is ___ pages, of which ___ pages of text, ___ figures on ___ pages, ___ tables on ___ pages, a list of used bibliographic sources (___ titles on ___ pages), a list of the author's publications on the subject of the thesis (___ titles on ___ pages), ___ appendixes on ___ pages, graphic material on ___ pages.

Plagiarism

An examination of the dissertation «*Title of the master's thesis*» by *Author's Full Name* was carried out for the correctness of the use of borrowed materials using the network resource «Antiplagiat» (access address: <https://antiplagiat.ru>) in the on-line mode DD.MM.YYYY. As a result of the verification, the correctness of the use of borrowed materials was established (the originality of the thesis is ___%)

INTRODUCTION

The introduction (preface) should be short and clear, there should be no general passages and digressions not directly related to the subject being developed. The size of the introduction should not exceed two pages.

The following content of the introduction (preface) is recommended:

- a brief analysis of achievements in the field, which is devoted to the subject of the master's thesis;
- aim of the master's thesis;
- principles underlying the engineering or scientific research, the search for a technical solution;
- mandatory indication of the tasks, the solution of which the master's thesis is devoted to.

An explanatory note should be done using a text editor, the font is Times New Roman, font size 14 points with line spacing exactly 18.

The text is placed on one side of an A4 sheet, observing the margins (right – 15 mm, left – 30 mm, top – 20 mm, bottom – 27 mm) and the intervals specified in Appendix B. Paragraphs in the text begin with an indentation of 1.25, set in Word in the Paragraph dialog box (see Appendix B).

It is not allowed to use auto-hyphenation of words in an explanatory note.

The size of the explanatory note must be at least 50–60 pages of typewritten (computer) text, excluding tables, figures, graphs. Auxiliary material (programs, design and technological developments, implementation certificates, etc.) are included in the thesis as an appendix.

The explanatory note must be bound in a hardcover (special folder for master's theses).

1 HEADING OF THE FIRST SECTION

Добавлено примечание (И.В.5): A space line is left between the section (subsection) heading and the text

It is recommended to start each section of the explanatory note on a new page.

The numbers of sections, subsections, paragraphs and subclauses should be in bold. Section and subsection headings are recommended to be formatted in bold 14-point font.

Section headings are written in capital letters without a period at the end of the heading. Subsection headings are written in lowercase letters, starting with the first uppercase. The headings are not underlined. Word hyphenation in headings is not allowed. If the title consists of two sentences, separate them with a period. If the section or subsection headings span multiple lines, the lines are aligned with the first letter of the heading according to Appendix B.

The text of the explanatory note should be clear and logically stated, not allow for different interpretations. When stating mandatory requirements in the text, the words «must», «should», «necessary», «required that», «not allowed», «prohibited» should be used. When stating other provisions, it is recommended to use the words: «allow», «indicate», «apply».

The text should use scientific and technical terms, designations and definitions established by the current standards, and in their absence – adopted in the scientific and technical literature.

The text is presented in compliance with the rules of spelling and punctuation. You should pay attention to paragraphs, enumerations, the use of numbers, symbols and dimensions.

1.1 Rules of text presentation

Enumerations are often used in the explanatory note. Enumerations can be simple or complex.

If the enumeration is simple, that is, it consists of words and phrases, then each element must be written on a new line, starting with a paragraph indentation and a dash, and at the end put a semicolon.

For example: The visual information reader includes the following units:

- distance sensor;
- photodiode array of size 32×32 elements;
- master oscillator and device for automatic adjustment of the sensitivity of the photomatrix.

Добавлено примечание (И.В.6): It is recommended to use a non-breaking space after the dash / number (for complex enumeration) (Ctrl+⇧Shift+Space)

A simple listing is allowed to be written in a selection with text, separating words or phrases from each other with a comma.

For example: Four types of sensors are used in the feed drive control system: a torque sensor, an angular speed sensor of the motor shaft and a digital load displacement sensor.

In a complex enumeration consisting of several sentences, each element of the enumeration is numbered and written with a capital letter, starting with the paragraph indentation, and at the end they put a period.

For example: In accordance with the methodology for the synthesis of digital controllers, the following operations are performed:

1 The Z-transformation of the transfer function of the serially connected zero-order extrapolators and the continuous part of the digital system is calculated. Using the bilinear transformation, the corresponding characteristic in the domain of W-transformations is found.

2 Using the found characteristic, the main indicators of an uncorrected digital system are determined: stability margins in phase and modulus, bandwidth, resonance frequency and resonance peak. The quality indicators are compared with the required values.

3 In the domain of W-transformations, such a characteristic of a physically realizable controller is chosen so that all the requirements imposed on the quality of control are satisfied.

1.2 Basic requirements for figures

Each figure should be clear, meaningful and related to the text, as well as be located as close to the explanatory part of the text as possible. It is allowed to place illustrations at the end of the explanatory note in the form of an appendix.

The figure should be placed after the paragraph in which the first link to it is given. Several figures can be placed on a separate sheet. In this case, place this sheet following the page where the link to the last of the placed figures is given. The figures placed in the text between paragraphs is centered and separated from the text and caption by one space line.

Each figure is accompanied by a caption. The caption must contain the word «Figure» without abbreviation and the serial number of the illustration in Arabic numerals, for example, Figure 7 with continuous numbering or Figure 2.7 when the illustrations are numbered according to the sections of the explanatory note.

In the text of the explanatory note, references should be provided to all figures without exception. In the references it is recommended to use the phrases like «according to Figure 2», «Figure 5.1 shows ... », «(see Figure 2) », etc. The figure, as a rule, is placed on one page. If the figure does not fit on one page, then it is

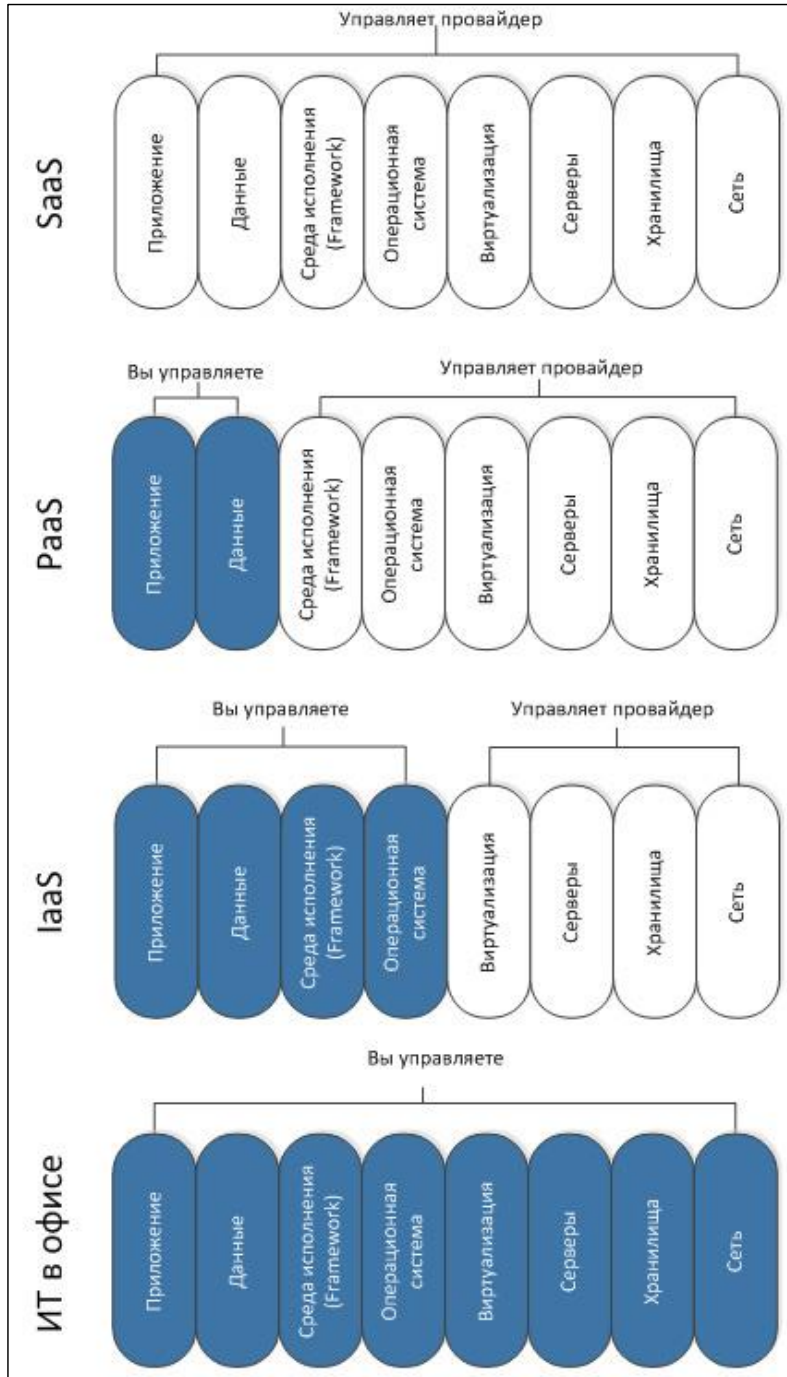


Figure 2 – Cloud computing model

Добавлено примечание (B.B.9): It is more convenient to use an invisible table so that the page number is in the appropriate place

System	Read-only fields that provide information about the record from the system, such as when the record was created or when it was last modified.	CreatedDate LastModifiedById LastModifiedDate
Name	All records need names to distinguish them. You can use text names or auto-numbered names that are automatically incremented each time you create a record.	The contact's name can be Jon Snow. The name of the support ticket can be CA-1024.
Custom	Fields that are created for standard or custom objects are called custom fields.	A custom field in the «Contact» object for storing the birthdays of contacts.

Text text.

If the table doesn't finish at the end of the page, then the horizontal bounding line may not be drawn. When continuing the table, the head is allowed to be replaced by the numbering of the columns. In this case, the numbering is also placed in the first part of the table after the head. Subsequent parts of the table after the words «Continuation of the table ... » indicating only its number begin with a line with the numbering of the columns.

Example:

The calculation of costs for materials and components (P_{MK}) is presented in the table 4.1.

Table 4.1 – Calculation of costs for materials and components

Name of component parts	Amount, units	Unit price, BYR.*	Sum, BYR.
1	2	3	4
Personal computer	1	1096	1096
Resource rental fee	1	61	732
Basic salary	1	109	109

Continuation of the table 4.1

1	2	3	4
Other components	1	100	100
In total			1928
Total with transport and procurement costs (15%), excluding payment for resource rent			2217

Note: The prices are taken from the price list of the Ofiston online store and the cloud service provider Salesforce as of May 10, 2020 [https://www.officeton.by/; https://www.salesforce.com/]

1.4 Basic rules for writing mathematical equations

When presenting conclusions from mathematical equations (formulas), it is not recommended to use the expressions: «we obtain», «we found», «we determined», etc.

The words should be used: «it was obtained», «it was found», «it was defined», etc. Connecting words «therefore», «from where», «since», «or» and others are placed at the beginning of lines, and punctuation marks are placed immediately after the mathematical equation. If the equations are preceded by a phrase with a generalizing word, then a colon must be placed after it.

All the equations located on separate lines are numbered. A group of similar equations placed on one line is also marked with one number. The equations are recommended to be numbered within the section to which they refer. The number of the equation must consist of the ordinal number of the section and the ordinal number of the equation, separated from it by a dot, for example equation (2.7). If there is one mathematical equation in the section, it is also numbered, for example equation (1.1). If there are no more than 10 mathematical equations in the explanatory note, it is allowed to use continuous numbering. The equations placed in appendixes should have separate numbering within each appendix.

Example:

Additional wages (W_A) are determined using the equation:

$$W_A = \frac{W_0 \cdot N_A}{100}, \quad (4.1)$$

where N_A – additional wage rate, $N_A = 10\%$.

$$W_A = 2700 \cdot 0,1 = 270 \text{ BYR.}$$

If necessary, the partial transfer of mathematical equation to the next line is allowed. Moreover, the sign of the operation, on which the transfer was made, is written twice: first time at the end of the first line and second time at the beginning of the second line. When transferring the equation on the multiplication sign, instead

Добавлено примечание ((B.B.11)): Use MathType

Добавлено примечание ((ПВ12)): From the beginning of the line!
Without paragraph indentation

Добавлено примечание ((B.B.13)): Multiplication sign «·»

of «·» use the sign «×». Transfer of equations on the division sign is not allowed, as well as expressions related to the signs of the root, integral, logarithm, trigonometric functions, etc.

References in the explanatory note text to the ordinal number of the equation should be given in parentheses with the obligatory indication of the words «equation», «formula», «transfer function», etc.

Example: Substituting equation (3.6) into formula (3.2), it is obtained ...

After the equation, a list and description of the symbols used in the equation, which were not explained earlier, should be placed. The list begins with the word «where», which is placed on a new line without indentation; do not use a colon after the word «where». The first described symbol is placed in the same line. The symbols must be separated from the description by a dash, aligning the list by symbols. Description of each symbol ends with a semicolon. The dimension of the symbol or coefficient is indicated at the end of the description and separated by a comma.

Example:

Equations for calculating the coordinates of neighbors:

$$\left. \begin{aligned} x_p &= x_c + R \cos\left(\frac{2\pi\rho}{P}\right) \\ y_p &= y_c + R \sin\left(\frac{2\pi\rho}{P}\right) \end{aligned} \right\} \quad (4.1)$$

Добавлено примечание (B.B.14): The symbols of the Greek alphabet and the Cyrillic alphabet should be regular, the Latin alphabet – in italics. The numbers are regular.

where x_p, y_p – neighbor coordinates;

x_c, y_c – center coordinates;

R – circle radius;

ρ – neighbor number;

P – number of neighbors.

The list of the used symbols with their description are allowed to be placed in one line without new paragraphs.

Example:

Final cost estimate (C_1):

$$C_1 = C_F + P_p + VAT, \quad (4.3)$$

Добавлено примечание (B.B.15): The symbols of the Greek alphabet and the Cyrillic alphabet should be drawn directly, the Latin alphabet – in italics

where P_P – planned profit, C_F – full cost, VAT – value added tax.

Добавлено примечание ([Виолетта16]): It is not allowed to finish a section with a picture or a table! It is recommended to summarize the section by conclusion.

CONCLUSION

In conclusion, it is necessary to list the main results that characterize the degree of dissertation aim achievement and summarize its content. The results should be stated in the form of fact statements, using the words: «studied», «investigated», «formulated», «shown», «developed», «proposed», «prepared», «manufactured», «tested», etc.

The enumeration text should be short, clear and contain specific information. The size of the conclusion should not be more than two pages of an explanatory note.

LIST OF REFERENCES

- 1 IBM documentation [Electronic resource]. – Access mode: <https://www.ibm.com/ru-ru/cloud/learn/iaas-paas-saas>
- 2 Salesforce documentation [Electronic resource]. – Access mode: <https://www.salesforce.com/crm/what-is-crm/>
- 3 Software testing help community [Electronic resource]. – Access mode: <https://www.softwaretestinghelp.com/types-of-software-testing/>
- 4 SAP CRM documentation [Electronic resource]. – Access mode: <https://help.sap.com/>
- 5 Bitrix24 documentation [Electronic resource]. – Access mode: <https://www.bitrix24.ru/apps/api.php>
- 6 Microsoft 365 documentation [Electronic resource]. – Access mode: <https://docs.microsoft.com/en-us/microsoft-365/?view=o365-worldwide>
- 7 Michael J. Kavis. Architecting the Cloud: Design Decisions for Cloud Computing Service Models / Michael J. Kavis – Wiley, 2014. – 224 p.
- 8 Salesforce trailblazer community [Electronic resource]. – Access mode: <https://help.salesforce.com/>
- 9 Rakesh G. Salesforce Platform App Builder Certification: A Practical Study Guide Paperback by Rakesh Gupta – Apress, 2019 – 241 p.
- 10 Fawcett A. Salesforce Lightning Platform Enterprise Architecture: Architect and deliver packaged applications that cater to enterprise business needs, 3rd Edition – Paperback, 2019 – 646 p.
- 11 Appleman D. Advanced Apex Programming in Salesforce 4th Edition/ Dan Appleman – Desaware Publishing, 2018 – 334 p.
- 12 Salesforce developer portal [Electronic resource]. – Access mode: https://developer.salesforce.com/docs/atlas.en-us.soql_sosl.meta/soql_sosl/
- 13 Udemy documentation. Lightning Web Component Development [Electronic resource]. – Access mode: <https://www.udemy.com/lwc>

LIST OF AUTHOR'S PUBLICATIONS

Conference abstracts

1–А. Abdulwahid, М. А. Histogram-based algorithms of low-contrast image enhancement / М. А. Abdulwahid, Y. Alhashimi // Технические средства защиты информации : тезисы докладов XVII Белорусско-российской научно – технической конференции, Минск, 11 июня 2019 г. / Белорусский государственный университет информатики и радиоэлектроники; редкол. : Т. В. Борботько [и др.]. – Минск, 2019. – С. 8–9.

2–А. Abdulwahid, М. А. Algorithms of image processing based on gaussian and laplacian pyramids / М. А. Abdulwahid // Кодирование и цифровая обработка сигналов в инфокоммуникациях : материалы международной научно-

Добавлено примечание ((В.В.17)): In the text of the explanatory note, all references to sources should be written with Arabic numerals in square brackets in ascending order. Such references should be provided to all sources included in the LIST OF REFERENCES. In the LIST OF REFERENCES, titles are placed and numbered in the sequence in which the references in the explanatory note text are located and numbered.

практической конференции, Минск, 19 апреля 2021 г. / Белорусский государственный университет информатики и радиоэлектроники ; редкол.: В. К. Конопелько, В. Ю. Цветков, Л. А. Шичко. – Минск : БГУИР, 2021. – С. 13–18.

APPENDIX A
(mandatory)
An example of appendix design

In the appendixes of the explanatory note, it is recommended to place information that is of reference or secondary importance, but is necessary for a more complete coverage of the project subject, or to place separate materials (printouts of programs, etc.) for the convenience of working with the text of the explanatory note. Appendixes can be mathematical equations, nomograms, auxiliary calculations, descriptions of algorithms and programs, technical characteristics of various devices, specifications, etc.

Separately published design documents may be used as appendixes. All appendixes are included in the general pagination.

All appendixes should be referenced in the text of the explanatory note. Appendixes are arranged in the order of references to them in the text. Appendixes are designated in capital letters of the Latin alphabet, starting with A. If there is one appendix in the explanatory note, it should also be marked with APPENDIX A.

Each appendix starts on a new page. At the top in the center of the page, write the word APPENDIX in capital letters and its letter designation. Below, in parentheses, lowercase letters indicate the word «mandatory», «recommended» or «reference». A heading, which is written with a capital letter, is placed lower in the center. Sometimes, after the heading, a back reference to the main text of the explanatory note could be provided.

APPENDIX B
(mandatory)

Sizes of text margins, the location of the headings
of the serial number of the page on an A4 sheet



GRAPHIC MATERIAL

Добавлено примечание ((k18)): Presentation slides are placed

Face Recognition in Spatial-frequency Domain

Al-Hashimi Yaseen Ehsan

for a master's degree

in the specialty 1-45 80 01

«Infocommunication systems and networks»

Supervisor
Baryskievic I.
PhD, associated professor

1

The aim and tasks of the work

- The aim of the master project is the development of efficient algorithms for processing the grayscale low-contrast images in the spatial domain.

To achieve this aim, the following tasks were solved:

- image analysis based on histograms;
- development of an algorithm for enhancement of low-contrast images based on histogram equalization;
- development of an algorithm for enhancement of low-contrast images based on the histogram specification;
- development of an iterative contrast optimization algorithm;
- software implementation and efficiency estimation of the developed algorithms for enhancement of grayscale noisy images. Enhancement the quality of images is of great economic importance, since it reduces the cost of performing work by reducing the scale of the survey.

2