

Dissertation Preparation Guidelines

For
All Undergraduate Degree Programs

Faculty of Applied Sciences
Rajarata University of Sri Lanka



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1. Scope and objectives

An undergraduate dissertation is a document which explains the findings of your undergraduate research, along with defense and demonstrates your mastery of your area of research and the scientific method.

Several departments offer courses on scientific writing and communication which provide students with guidance on how to write the contents of a dissertation. Hence, the objective of this document is confined to providing a stylistic guideline to undergraduates and advisors to ensure a certain degree of uniformity in format and style across degree programs in the faculty.

However, students are advised to consult their respective departments for program specific instructions.

This guideline is applicable to all undergraduate students enrolled in degree programs of the Faculty of Applied Sciences that require a dissertation as part fulfillment for the award of their degree.

2. Organization of a Dissertation

A dissertation consists of three sections i.e., front matter, body and back matter. The front matter serves as a navigation guide to the rest of the sections of the dissertation.

A. Front Matter

- Title page
- Declaration page of the candidate & supervisor
- Abstract
- Dedication (optional)
- Acknowledgement
- Table of contents
- List of figures (if applicable)
- List of tables (if applicable)
- List of abbreviations (if applicable)
- List of appendices (if applicable)

B. Body

- Introduction
- Materials and method/Methodology
- Results
- Discussion
- Conclusion

C. Back matter

- References
- Appendices (if applicable)

2.1.Front pages

2.1.1. Title Page

A sample title page (only required in the final hard bound dissertation) is included in **Appendix C**.

2.1.2. Declaration

The signed and dated declaration should be made by the candidate See **Appendix D** for statement of declaration.

2.1.3. Abstract

The abstract should be a clear and concise description of the problem addressed and methodology together with key findings and conclusions.

It is a mandatory for undergraduates to submit their abstracts at the Annual Undergraduate Research Sessions. Specific guidelines for formatting an abstract are given in **Appendix F**.

2.1.4. Dedication

This section is optional. The dedication is a message from the author dedicating a dissertation in tribute to a person, group, or cause. Include example of dedication.

2.1.5. Acknowledgement

In the acknowledgement section, students are encouraged to express gratitude to all individuals, institutes and funders that have facilitated their research and writing. Include sample acknowledgement

2.1.6. Table of Contents

All front matter pages and the main chapters and subsections (up to level 3) of each chapter, appendices and other supplements should be included in the table of contents with their page numbers. Include sample table of contents.

2.1.7. List of Figures

If the dissertation contains any figures, then a separate list should be prepared to include the caption of the figure and the page number. The chapter number should be included in defining the number of figures. This list should be on a separate page. Include sample table of contents.

2.1.8. List of Tables

If the dissertation contains any tables, then a separate list should be prepared including the title of the table and the page number. The chapter number should be included in defining the number of tables. This list should be on a separate sheet.

2.1.9. List of abbreviations

If you use abbreviations extensively in your dissertation, you should include a list of abbreviations and their corresponding definitions.

The abbreviations in the list should be arranged in alphabetical order. The list of abbreviations should be on a separate page.

2.1.10. List of Appendices

If the dissertation contains appendices, then a list should be prepared to include the name of the Appendix and the page number. Use a separate sheet for this list.

2.2. Body

2.2.1. Introduction

The introduction should set the work in the context of existing knowledge, establishing the need for the current study and its significance, and stating clear aims and objectives. Start the introduction broadly with the general theme and move towards focusing on your topic.

2.2.2. Materials and Method / Methodology

All materials as well as the procedures that were used in the study should be described in sufficient detail to allow direct repetition of the work by others. Any statistical analyses carried out needs to be clearly described.

2.2.3. Results

Major findings of the study in relevance to each specific objective of the study should be reported here. Data can be summarized either in the form of tables and figures. Do not use both tables and figures to present the same dataset.

2.2.4. Discussion

Findings should be framed in with respect to prevailing knowledge as described in the introduction. Interpretation of findings should be clearly and logically stated. Avoid making statements and conclusions that are not completely supported by data.

2.2.5. Conclusion

Provide a summary of the goals and the main findings of the study. Also, suggestions for future work might be included.

Note: Please refer further instructions given by the department and the supervisor(s)

2.3.Back matter

2.3.1. References

A reference list is the list of all books, articles, and other source of materials cited in the dissertation, compiled according to international referencing styles.

2.3.2. Appendices

Supplementary material could be included as appendices rather than in the main text. For example, appendices may contain questionnaires, detailed descriptions on apparatus, extensive tables of raw data, computer algorithms, etc. If appendices contain photocopied material, the photocopies should be of letter quality.

3. Formatting Guidelines

3.1.General Instructions

3.1.1. Paper

Each copy of the dissertation should be printed on A4-sized clear white paper of at least 80 gsm in thickness and be used throughout the dissertation. However; paper of different quality may be used for figures, photographs, maps, etc.

It is not essential to print the dissertation in color unless you have included figures that require color for their interpretation. Language and writing style

You are free to use either British (UK) or American English. However, consistency should be retained throughout the dissertation by adhering to one of the two. Students should be aware that British and American English do not only differ in the spelling, but also in the use of some prepositions and phrases. Students should use active voice as far as possible. Students are free to acquire assistance with proof reading from a knowledgeable person. Any person involved with professionally proofreading a thesis should confine themselves to correcting grammatical/spelling errors and should not comment on the content of the thesis.

The term dissertation is typically used to refer to report submitted by an individual. Instructions on how to compile group project reports can be provided to students by their respective study programs.

3.2.Formatting and Style

3.2.1. Page Format and Margins

The left margin of a page should be 1.25 inches and 1 inch on all other sides. One and a half (1.5) line spacing is required except for the abstract, tables and indented quotations, where single line spacing may be used. The space after a paragraph should be 6 points. Candidates may choose an appropriate spacing for the appendices. The version of the dissertation to be submitted to external examiners should be line numbered.

3.2.2. Pagination

Pages should be numbered consecutively throughout the dissertation.

Preliminary pages (i.e., title page, statement of declaration, abstract, acknowledgements, table of contents, list of figures, list of tables and list of abbreviations) that precede the main text should be numbered with lower case roman numerals beginning with one (i).

Appendices that follow the list of references should be numbered with upper case roman numerals starting with one (I).

Number the main text consecutively beginning with the Arabic numeral one (1).

All page numbers should be placed at the bottom center of the page.

3.2.3. Page/ Paragraph Breaks

A new chapter should always start on a new page. A section/ subsection or a paragraph should not begin on the last line of a page.

3.2.4. Headings

All chapters and their subsections must be numbered and titled. Use numerals up to three levels and use bold and/or italicized titles for more levels. Please refer Appendix E.

Example:

CHAPTER 2 – CHAPTER TITLE (first level)

2.1 Title of the section (second level)

2.1.1 Title of the subsection (third level)

Title of the sub-subsection (fourth level)

Title of the sub-sub-subsection (fifth level)

3.2.5. Font styles

The entire dissertation should be written in Times New Roman font style.

- Chapter Heading (first level):
 - Should be written in a single line.
 - 14 Font size, Bold, 2.5 line spacing, 24 pt space below the line, Center aligned
 - The chapter number - All Upper case.
 - The chapter title – Capitalized each word except prepositions (Title case).
- Section heading (second level):
 - Sentence case-12 Font size, Bold, 2.0 line spacing, Left justified.
- Sub-section heading (fourth level):
 - Sentence case-12 Font size, Bold, 2.0 line spacing, Left justified.
 - No chapter number
- Other sub-sub-section heading (fifth level):
 - Sentence case-12 Font size, Bold, 2.0 line spacing, Left justified.
 - No chapter number

- Main body text:
 - Sentence case - 12 Font size, 1.5 line spacing, justify.
 - There should be a 6 pts space after each paragraph.
- Tables and Illustrations:
 - Font size may be varied while maintaining legibility
 - Table and Figure captions should be 12 Font size, 1.5 line spacing, Center aligned

Please refer the Appendix E.

3.2.6. Tables, Figures and Illustrations

Data can be summarized either in the form of tables and figures. Tables consist of rows and columns and are preferred when the numerical values of your data are necessary for the reader to interpret your work. In contrast, figures such as graphs and charts, are appropriate to demonstrate overall trends in the data. Do not use both tables and figures to present the same dataset. Furthermore, figures such as maps and illustrations could be used to indicate the location of study sites and the organization of experimental setups and designs. Please note that maps should include a scale and north arrow.

All tables and figures should be placed after (close to) their first reference in the text and center aligned.

Tables and figures should be numbered with the corresponding chapter number and the image/ figure number followed by a colon. An example is given bellow.

- the second figure of the chapter 3 should be named as “Figure 3.2:”
- the sixth table of the chapter 5 should be named as “Table 5.6:”

The table captions should be center aligned and placed above the table and the figure captions should be center aligned and placed below the figure. See the Table 1.1 and Figure 1.1 given bellow.

Captions of all tables and figures should be given indicating enough information so that they can be understood without referring to the text and should highlight key messages that you intend to convey to the reader do not include table/ figures that are not referred in the text. The table captions should be written above the table and figure captions should be written below the figure.

Table 1.1: Sample table. Causes of death for Asian elephants in Anuradhapura, Kurunegala, Mannar, and Puttalam districts, Sri Lanka, from 2009–2018. Values in each category indicate number of elephants necropsied by Department of Wildlife Conservation (DWC) veterinarians. See text for age class designations.

	Male		Female		Juvenile	Calf	Unknown	Total
	Adult	Subadult	Adult	Subadult				
Intentional	87	47	60	18	18	5	21	256
Gunshot	66	15	39	2	3	2	11	138
Hakkapatas	8	30	12	10	11	2	5	78
Poisoning	13	2	9	6	4	1	5	40
<i>Total</i>	<i>177</i>	<i>66</i>	<i>102</i>	<i>34</i>	<i>42</i>	<i>15</i>	<i>62</i>	<i>498</i>

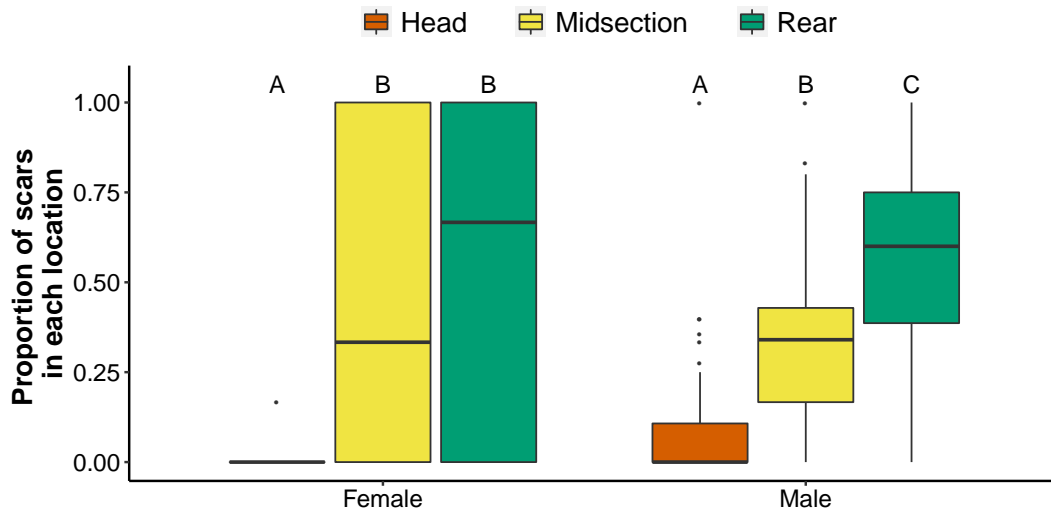


Figure 1.1: Sample figure. Proportion of scars by body location for female and male elephants. Females and males were analyzed separately, with letters indicating significantly different scar proportions between body locations as revealed by Nemenyi tests ($P < 0.05$). Thick lines inside boxes indicate the median scar count for each age class, with boxes extending from the first to the third quartile; fences extend to 1.5 times the interquartile range. Circles show outliers beyond this range.

3.2.7. Formulae

Formulae should be printed leaving ample space around the formulae. Subscripts and superscripts should be clear. Meanings of all symbols should be stated immediately below the equation. Equations should be numbered serially at the right-hand side within parentheses.

Students can use “Insert > Equation” or “Microsoft Equation Editor” or any other equation editing software of their choice. formulae. An example is given below.

$$HD_{norm}(X, Y) = \frac{\sum_{i=1}^w \sum_{j=1}^l X_{i,j} \oplus Y_{i,j}}{w \times l} \quad (1)$$

Where;

- w - Height (number of rows) of the iris template
- l - Width (number of columns) of the iris template
- X, Y - Two iris templates to be compared
- $X_{i,j}, Y_{i,j}$ - bit value at i, j^{th} position

3.2.8. Reporting stational output

The proper reporting of stational output from analysis is an integral part of dissertation writing. Always report exact p values and confidence intervals (CIs) whenever possible.

The format for reporting some common statistical tests is given below.

Standard deviations and **CI**s should be reported in parentheses and brackets respectively. E.g., The average weight of species A was 12.2 g ($SD = 4.5$) or 12.2 g, 95% CI [10.21-13.30]. **Chi-Square statistics** should be reported with degrees of freedom and sample size in parentheses.

E.g., The preference for treatment A was not associated with occupation ($\chi^2(3, N = 126) = 24.5, p \leq 0.54$).

t-Tests are also reported like chi-squares but only the degrees of freedom are in parentheses.

E.g., There was a significance difference in N concentration between soil samples from habitat A ($\bar{X} = 0.003$ mg/g, $SD = 0.002$) and B ($\bar{X} = 0.009$ mg/g, $SD = 0.001$), $t(24) = -4.36, p \leq 0.025$.

Regression analysis should be reported with the percentage of variance explained along with the corresponding F test for β .

E.g., Clay content explained a significant proportion of variance in the phosphorous content in soil, $R^2 = 0.72, F(1, 24) = 65.22, p \leq 0.004$.

3.2.9. References

Referencing styles differ between study programs. Students may use reference managing software such as Mendeley (<https://www.mendeley.com/download-desktop-new/>) and Zotero (<https://www.zotero.org>) to format references. Both these options are free and come with “cite while you write” plugins which can be integrated with your word processing software to automatically compile a list of references when they are cited in your text.

All references cited in the dissertation should appear in the reference list, and all references in the reference list should be cited in the text. List and number all references in 12-point Times New Roman, single-spaced, in the reference section of the dissertation.

For Biological Sciences/ Health Promotion Degrees

The reference list should be formatted to comply with Harvard referencing style. References are cited in-text by author and year and are not numbered. All references in the text must be listed in the reference section with names of authors arranged alphabetically.

References should be composed in the following order:

Author’s name and initials/ Year of Publication/ Title of article/ Name of Journal/ Volume/ Number and pages.

Example:

Periodicals:

Rao, D.R., Sunki, G.E. and Chen, C.P. (1978). Breeding methods of Goldfish. *J. Aquaculture* 12: 45 – 49.

Edited symposia or chapters in books:

Vincent, J.M. (1997). Nitrogen fixation by legumes. pp. 38 – 45. *In*: Whitehead, J.P.(Ed). *Soil Nitrogen*, Butterworths, USA.

Books:

Longe, L.G. (1970). *Methods of soil Analysis*, Pergamon Press, Oxford, U.K..

Note: If reference is made in the text to a publication by 3 or more authors, the name of the first author should be used, followed by ‘*et al.*’.

See <https://www.mendeley.com/guides/harvard-citation-guide> for further details.

For Computing Degrees (IT/CS)

The reference list should be formatted to comply with IEEE referencing style. Reference list entries should appear in the order the sources are cited in the text of the dissertation.

When referencing in-text, enclose the citation number in square brackets, for example [1]. In-text citation start at [1] and continue in ascending order throughout the dissertation, unless you are referring to a source you have already cited in the text, in which case the previously assigned number should be used. Where appropriate, include the name(s) of editors of referenced books. The sentence punctuation follows the bracket [2]. Refer simply to the reference number, as in [3]—do not use “Ref. [3]” or “reference [3]” except at the beginning of a sentence: “Reference [3] was the first . . .”.

Use et al. when three or more names are given for a reference cited in the text. The ‘Reference list’ does not contain a chapter number.

Some examples are given below:

- [1] G. Eason, B. Noble, and I. N. Sneddon, “On certain integrals of Lipschitz-Hankel type involving products of Bessel functions,” *Phil. Trans. Roy. Soc. London*, vol. A247, pp. 529–551, April 1955. (references)
- [2] J. Clerk Maxwell, *A Treatise on Electricity and Magnetism*, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68–73.
- [3] S. Jacobs and C. P. Bean, “Fine particles, thin films and exchange anisotropy,” in *Magnetism*, vol. III, G. T. Rado and H. Suhl, Eds. New York: Academic, 1963, pp. 271–350.

All web references should give the complete URL and the date of access, in addition to the standard reference details.

See the following link for details and examples for IEEE reference style:

- <https://ieeauthorcenter.ieee.org/wp-content/uploads/IEEE-Reference-Guide.pdf>

For Chemical Sciences Degree

The reference list should be formatted to comply with RSC referencing style.

Use superscript numbers to show when a statement in your text has an external reference source, for example Wittig.³ Usually these should appear at the end of the sentence (after the punctuation), but can be after the relevant word or compound. The reference numbers should be cited in the correct numerical sequence through the text (including those in tables and figure captions, numbered according to where the table or figure is designated to appear).

If a statement has multiple references you should reference all of the citations in the text. If you have two citations, or if you have more than two and the numbers are not consecutive, use commas (with no spaces) between numbers, for example 12,13 or 12,14,15. If there are more than two numbers and they are consecutive, use an en-dash to separate the first and last citation, for example 14–20.

Some examples are given below:

1. *Cellulose Nanocomposites: Processing, Characterization and Properties*, ed. K. Oksman and M. Sain, American Chemical Society, Washington, 2006.
2. *Model Cellulosic Surfaces*, ed. M. Roman, American Chemical Society, Washington, 2009.
3. *The Nanoscience and Technology of Renewable Biomaterials*, ed. A. L. Lucia and O. J. Rojas, John Wiley & Sons, Singapore, 2009.
4. A. C. O'Sullivan, *Cellulose*, 1997, 4, 173–207.
5. M. A. S. A. Samir, F. Alloin and A. Dufresne, *Biomacromolecules*, 2005, 6, 612–626.
6. Y. Nishiyama, *J. Wood Sci.*, 2009, 55, 241–249.

See the following link for details and examples for RSC reference style:

- <https://edu.rsc.org/download?ac=14556>
- <https://www.bath.ac.uk/publications/library-guides-to-citing-referencing/attachments/royal-society-chemistry-style-guide.pdf>

For Physical Sciences Degrees

The reference list should be formatted to comply with APS referencing style. Students have an obligation to include a set of references that communicates the precedents, sources, and context of the reported work. References should be as complete as possible and should be drawn from peer-reviewed journals as well as e-print archives. All references should be cited in the body of the text and not in the abstract. In the body of the text, references should be numbered consecutively in order of first appearance (enclose the citation number in square brackets, for example [1]). The onus is upon authors to update references throughout the review and publication process. The completeness and accuracy of the data contained in the references are especially important.

Some examples are given bellow:

- [1] J. K. Rowling, *Harry Potter and the Philosopher's Stone*, 1st ed. (Bloomsbury Publishing Inc, London, 1997).
- [2] C. Petit and J. Sieffermann, 18, (2007).

See the following links for details and examples for IEEE reference style:

- <https://journals.aps.org/authors/references-physical-review-physical-review-letters>
- <https://citationstyle.org/styles/american-physics-society>
- <https://apps3.aps.org/communications/styleguide/index.html>

3.2.10. Appendices

Detailed information or data which may increase the usefulness of the dissertation for examiners and subsequent readers, but which are too detailed for inclusion in the main body of the dissertation may be included as appendices. Appendices should comply with the format of the rest of the dissertation with respect to margins but may be single spaced.

3.2.11. Cover, Binding and Submission

On the cover page, the title should be placed 3 inches from the top, in Times New Roman font size 22. The author's name/ names with initials and the year of submission should be placed 2 inches from the bottom, in a font size of 20. All text should be centered. (See Appendix A).

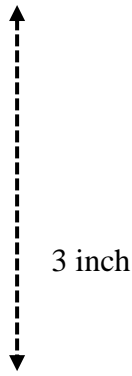
1. **Draft version of the dissertation:** The version of the dissertation to be submitted to the examiners should be line numbered and soft bound and or as soft copy as specified by your study program.
2. **Final submission of the dissertation:** The final version of the dissertation that a student intends to submit should be free from typographical, grammatical and other errors. After incorporating any revisions suggested by the examiners, two (02) copies of the dissertation should be hardbound with a dark blue cover (Insert accepted color code). The title, authors name and year of submission should be printed in gold lettering ((Insert accepted color code).
3. **Spine:** The shortened name of the degree and the year of submission should be printed on the spine as depicted in **Appendix B**. The short name of the degree should commence at 20 mm from the top of the spine and should be in GOLD lettering (Insert accepted color code).

3.2.12. Dissertation Submission Checklist

Please check if you are in compliance with this checklist.

#	Item	Yes / No
1	Have I used Times New Roman as my font in the thesis?	
2	Is every page of the dissertation correctly numbered?	
3	Is the pagination continuous? Have all pages been included?	
4	Is the placement of page numbers on the bottom right edge throughout the dissertation?	
5	Are the preliminary pages (title page to list of abbreviations) number with lower case roman numerals? and appendices with uppercase roman numerals?	
6	Are the margins 1' on three sides and 1.5' in the left side?	
7	Are you consistent with your language use (either British English or American English)?	
8	Have you checked for grammatical and typographical errors?	
9	Have you started all your chapters from a new page?	
10	Have you followed the instructions when writing headings and sub-headings?	
11	Are all the tables and figures numbered and with appropriate captions?	
12	Have you used the appropriate referencing style?	
13	Have all the references included in the body of the dissertation included in the reference list and vice versa?	
14	Has the list of tables and list of figures containing all the tables and figures been included in the dissertation?	
15	Has the Table of Content including all the chapters, main headings and subheadings with correct page numbers been included?	
16	Is the title of the abstract the same as that on the title page?	
17	Has the declaration form been duly filled and signed by you and your advisor/s?	
18	Have you prepared an abstract to be submitted to the Annual Undergraduate Research Session?	

Appendix A : Cover Page



Smart Pattern Recognition Method for Human Facial Recognition

Letters : Title case, Bold
Font : Times New Roman, size 22
Font color : Black
Line spacing: 1.5 lines
Alignment : Center

Letters : Bold
Font : Times New Roman, size 20
Font color : Black
Line spacing: 1.5 lines
Alignment : Center

A.B. Perera

2010



Appendix B : Dissertation Spine

B. Sc. Applied Sciences

2010



Write appropriate name of the degree;
B.Sc. in Applied Sciences
B.Sc. (Honors) in Applied Sciences
B.Sc.in Information Technology
B.Sc. (Honors) in Information Technology
B.Sc.in Health Promotion
B.Sc. (Honors) in Health Promotion

Appendix C : Title Page

SMART PATTERN RECOGNITION METHOD FOR HUMAN FACIAL RECOGNITION

A.B. Perera – Registration No

Letters : Bold
Font : Times New Roman, size 14
Font color : Black
Line spacing: 1.5 lines
Alignment : Center

Letters : All Capital, Bold
Font : Times New Roman, size 16
Font color : Black
Line spacing: 1.5 lines
Alignment : Center

Letters : Sentence Case
Font : Times New Roman, size 12
Font color : Black
Line spacing: 1.5 lines
Alignment : Center

Dissertation submitted in partial fulfillment of the requirements for the award of the degree of Bachelor of the Science in Information Technology.

Department of Computing

Rajarata University of Sri Lanka.

Letters : Bold
Font : Times New Roman, size 16
Font color : Black
Line spacing: 1.5 lines
Alignment : Center

→ 2010

Letters : Title Case
Font : Times New Roman, size 14
Font color : Black
Line spacing: 1.5 lines
Alignment : Center

Apendix D : Declaration

The following certification should be added ONLY in the hard bound dissertation that is submitted after the project defense.

Declaration

The dissertation is our original work and has not been submitted previously for a degree at this or any other university/institute. To the best of our knowledge it does not contain any material published or written by another person, except as acknowledged in the text.

Student’s name Date
Signature

Student’s name Date
Signature

Student’s name Date
Signature

This is to certify that this dissertation titled **<title>**is based on the work of **<name of the student/students>**under my/our supervision. The dissertation has been prepared according to the format stipulated and is of acceptable standard.

Certified by

Supervisor 1 Name Date
Signature

Supervisor 2 Name Date
Signature

.....
Head/ **<Department Name>**,
Faculty of Applied Sciences,
Rajarata University of Sri Lanka,
Mihintale.

Date

CHAPTER 4 - RESULTS AND DISCUSSION

4.1 Introduction

The iris recognition performance of the setup as a whole is examined and discussed in this chapter. Main experiments were carried out to find the best separation of intra-class and inter-class variations, also to ensure the accuracy of the recognition setup. So that False Accept Rate and False Reject Rate are minimized. Apart from them, some other experiments were carried out to ensure the uniqueness of iris template and to find the best number block size and word size of an iris template.

4.2 Uniqueness of final bit vector patterns

One of the major characteristics of a template which is to be used as biometric authentication template is the uniqueness. The patterns of each biometric template of different users should be distinguishable. Before to use any biometric trait (or type) in an authentication system, it is essential to confirm the templates of the desired biometric trait are unique (or divergent) from each other. Hamming Distance (HD) and Degrees-of-Freedom (DoF) are two measures that could be used to measure such characteristics.

4.2.1. Use of hamming distance and degrees-of-freedom

The enrolled templates of different individuals were compared to each other in order to determine the uniqueness. Such a comparison could be categorized into inter-class comparison.

Inter-class comparison

From every single comparison, a value for hamming distance was obtained. Since the proposed approach could be executed for a different possible number of repetitions of XOR function and word sizes, this experiment was executed for a selected possible number of repetitions of XOR function while keeping word size as 20.

Appendix F : Abstract Template

Authors: Times NR, 12pt, 1.0 line spacing, centered, 10pt space after names
* for corresponding author

EFFECTIVE PRIVACY-PRESERVING IRIS RECOGNITION

Title: Upper Case, Times NR, 12pt, 1.0 line spacing, Bold, Centered, 10pt space after title

Wickramaarachchi^{1*}, Xiang Jianwen² and Al-haj M. Yousif²
of Computing, Faculty of Applied Sciences, Rajarata University of Sri Lanka, Mihintale, Sri Lanka
Computer Science and Technology, Wuhan University of Technology, Hubei, China

Affiliation: Times NR, 12pt, Italic, Centered, 1.0 line space, 10pt space after last affiliation

Iris recognition plays a vital role in modern identity management and access control. The patterns of the structure of the irises are differed and unique to every single individual. It keeps a stable structure through the whole life of an adult. These properties make good interest towards using iris as a biometric trait for authentication or identification of individuals. There are numerous research works have been done on developing novel approaches to authenticate legitimate users while keeping their privacy based on two main technical streams; Feature Transformation Techniques and Biometric Cryptosystems. Though these techniques are theoretically sound, they rarely guarantee the required non-invertibility and non-linkability properties, whereas revocability is realized quickly.

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In this paper, using feature transformation techniques, we propose an effective biometric system for iris templates based on XOR function, while protecting the privacy of templates. As a new method to transform extracted features, we use XOR function to convert original iris code into another representation. An application specific key is XORed with each column of input iris vector; then each column is XORed with its adjacent columns up to the desired number of rounds.

Compared to the recognition performances of the other existing works, we have succeeded to come to closer recognition performances of existing works. The morsel value of probability to rebuild the original iris template of a single subject from enrolled iris bit vector templates in either single application or different applications, ensures the irreversibility and renewability. The use of XOR function within the approach ensures the unlinkability. The final result is highly positive. The study opens for future enhancements.

Keywords: maximum five keywords

Keywords: Biometric Recognition, Privacy Protection, Feature Transformation Technique, XOR