Al-Quds Open University

Faculty of Graduate Studies and Scientific Research

Master of Information Technology

Title of Research Thesis

عنوان الرسالة باللغة العربية

THESIS

by

First name Middle name Last name

Student ID: 03300YYYYZZZZ

Supervisor

Dr. First name Last name

Submitted in Partial Fulfilment of the Requirements

For the Degree of Master of Information Technology at the Faculty of Graduate Studies

Ramallah, Palestine

June, 2024

Al-Quds Open University

Faculty of Graduate Studies and Scientific Research

Master of Information Technology

Title of Research Thesis

عنوان الرسالة باللغة العربية

THESIS

by

First name Middle name Last name
Student ID: 03300YYYYZZZZ

Supervisor

Dr. First name Last name

Submitted in Partial Fulfilment of the Requirements

For the Degree of Master of Information Technology at the Faculty of Graduate Studies

Ramallah, Palestine

June, 2024

Examination Committee Page

The committee for

[Student Full Name]

certifies that this is the approved version of the following thesis and is acceptable in quality and form for publication in paper and in digital formats:

Title of Research Thesis [English]

Committee Members:

Committee Supervisor: [insert name]
Signature: _____
Date: _____

Committee Co-Supervisor *(if appropriate)*: [insert name]
Signature: _____
Date: _____

Committee First Member: [insert name]
Signature: _____
Date: _____

Committee Second Member: [insert name]
Signature: _____
Date: _____

Committee Third Member *(if appropriate)*: [insert name]
Signature: _____
Date: _____

Al-Quds Open University

2024

Declaration

I, [student full name], hereby declare that the work presented in this thesis has not been submitted for any other degree or professional qualification, and that it is the result of my own independent work.

Signed:

Date:

Abstract

Title of Research Thesis [English]

To insert Abstract text here, select this text and then either type the text you wish to use or paste text from another document, being sure to keep the text only and not the formatting from the previous document. To keep text only, choose Paste, and then from the drop-down box that will appear, choose the Keep Text Only option on the right, with the icon of a clipboard and the letter A

The abstract is a brief summary of your research thesis, and should be no longer than 300 words. It starts by describing in a few words the knowledge domain (broad area of research) where your research takes place and the key issues of that domain that offer opportunities for the scientific or technological innovations you intend to explore. You then present briefly your research statement (focus area), your research approach, the results you have achieved, and the anticipated implications of such results on the advancement of the knowledge domain. It is important to keep your abstract concise, clear, and objective.

عنوان الرسالة باللغة العربية

الخلاصة عبارة عن تلخيص للعمل البحثي، ويجب ان لا يحتوي أكثر من 300 كلمة. يبدأ الملخص بوصف مختصر لمجال المعرفة (المجال العام للبحث) والتي تظهر أهمية البحث والنقاط الأساسية في المجال. بعد ذلك يتم عرض خطوات البحث (المجال الدقيق)، طريقة البحث المتبعة، و ملخص للنتائج النهائية. يمكن أيضا عرض الاثر المتوقع لهذه النتائج على مجال المعرفة. كما يجب التنبيه على جعل الملخص مختصر، واضح، وموضوعي.

ويجب أن تكون مركزة وأن تشتمل على المعلومات التالية :

- المشكلة موضوع الرسالة أو الغرض منها .

- ما قام به الباحث بوجه عام .

- ما توصل إليه الباحث (أهم النتائج عموماً) .

- ما يستخلص من الموضوع (إن كان هذا منفصلاً عن النتائج) .

ويجب أن يتجنب الطالب الإطالة في هذه الخلاصة وأن يراعي فيها الدقة وتجنب الأخطاء .

Associated Publications

List of publications goes here, formatted as a full citation.

Consider including publication in an appendix, too.

Acknowledgements

In the name of Allah, Most Gracious, Most Merciful

This page is used to thank individuals, groups, or organizations for their support. If you are required to acknowledge the support of a sponsor, this is generally an appropriate place to do so.

An acknowledgments page must be included in your final dissertation or thesis. The acknowledgments page should be listed in the table of contents. Place it after the final list used in the document, and before any dedication, abstract, or epigraph that is included.

It is appropriate to acknowledge sources of academic and financial support; some fellowships and grants require acknowledgment.

First name, Last name

June 2024

Dedicated to my parents.

Note: If you include a special dedication as shown here be sure to keep it brief and center it on the page both horizontally and vertically. Alternatively, you may remove this page altogether, and a special dedication can be placed as the final paragraph of your acknowledgments page. **Do not include the dedication page in your table of contents.**

Table of Contents

The Table of Contents (TOC) is designed to be generated automatically from your headings. It is important not to type in this area. Instead, To update the TOC right-click anywhere in it (not including the title) and select "Update Field". You will be given the choice of "Update page numbers only" or "Update entire table". The former will, as it says, change only the page numbers, and only for items already in the TOC; the latter will update the titles as well, and will add new items in accordance with any new headings/section titles you may have created. These will be determined by the use of the appropriate styles. If a header is missing from the TOC after updating the entire table,

check that the header in question is using the appropriate heading style, then update the entire TOC again.

List of Figures

If one or more figures are used in the document, there must be a list of all figures and it must be included in the table of contents. The list should be spaced at 1.15. Begin each listing on a new line.

To update the List of Figures, which is a specialized TOC, right-click anywhere in it (not including the title) and select "Update Field". You will be given the choice of "Update page numbers only" or "Update entire table". The former will, as it says, change only the page numbers, and only for items already in the TOC; the latter will update the titles as well, and will add new items in accordance with any new figure titles you may have created. These will be determined by the use of the appropriate styles. If a figure title is missing from the list after updating the entire table, check that the figure title in question is using the Figure Title style, then update the entire TOC again

List of Tables

If one or more tables are used in the document, there must be a list of all tables and it must be included in the table of contents. The list should be spaced at 1.15. Begin each listing on a new line.

To update the List of Tables, which is a specialized TOC, right-click anywhere in it (not including the title) and select "Update Field". You will be given the choice of "Update page numbers only" or "Update entire table". The former will, as it says, change only the page numbers, and only for items already in the TOC; the latter will update the titles as well, and will add new items in accordance with any new table titles you may have created. These will be determined by the use of the appropriate styles. If a table title is missing from the list after updating the entire table, check that the table title in question is using the Table Title style, then update the entire TOC again

List of Abbreviations

AI	Artificial Intelligence
CNN	Convolutional Neural Networks
HTTP	Hypertext Transfer Protocol
QOU	Al Quds Open University
TLS	Transport Layer Security

Chapter 1: Introduction

1.1 Overview and Background

Give an overview of the knowledge domain (broad area of research) where your research takes place. This section should take the form of an abstract of the general subject or study area and identify the discipline(s) within which it falls.

This template is designed to assist you in writing a research thesis in the correct structure and format as required by the Faculty of Technology and Applied Sciences (TAS). This template should serve as a starting point for any student writing a research thesis. The headings and styles give an indication of the sections required in the research thesis. A research thesis is an outline of your project that is designed to:

- Define a clear question and approach to answering it

- Highlight its originality and/or significance

- Explain how it adds to, develops (or challenges) existing literature in the field

- Persuade readers of the importance of the work.

The introduction of the research thesis should aim to catch the reader's interest and should be written in a style that can be understood easily by any reader with a general computing science background. It gives an overview of the research project you propose and explains the background of the project, focusing briefly on the major issues of its knowledge domain. It then proceeds with the presentation of the research focus, which can take the form of a hypothesis, a research question, a project statement, or a goal statement.

1.2 Motivation

In this section you should write about the major motivations of your research.

1.3 Problem Statement

In this section you should provide a research statement that captures both the essence of the project and its delimiting boundaries (scope). Hence it should be followed by a clarification of the extent to which you expect its outcomes to represent an advance in the knowledge domain you have described. This section states the problem that you are exploring. The research statement is specific, concise, and clear. Answer the question: "What is the gap that needs to be filled?" and/or "What is the problem that needs to be solved?" State the problem clearly early in a paragraph. Limit the variables you address in stating your problem. Consider framing the problem as a question. You will probably need to address questions such as;

- What is the specified aspect in the defined area (you provided the area in the research problem section) in which you will be working?

- What is the shortcoming in the defined area or gap in this defined area that you would like to address

1.4 Research Objectives

Next, you have to describe the research goal(s) as it relates to solving the uncertainty or question you are interested in. It should explicitly hint towards the contribution you want to make with the intended study. You will elaborate on the scientific contribution made in a later section. **Goal** describes what you want to achieve. **Objectives** describe **how** you are going to achieve the goal(s).

Objectives should be S.M.A.R.T.:

- **Specific** – be precise about what you are going to do
- **Measureable** – specify an indicator for success, so that you will know when you have reached your goal
- **Achievable** –a less ambitious but completed objective is better than an over-ambitious one that you cannot possible achieve.
- **Realistic** – do you have the necessary resources to achieve the objective?
- **Time constrained** – determine when each stage needs to be completed.

The clarification of the research objectives should relate your research to the work carried out by others. It should explain the measure to which your work develops from their work and the extent to which it diverges from theirs to open up new and yet unexplored avenues. It explains what you plan to do to tackle your research problem, why you plan to do it that way, and how you are going to do it.

1.5 Thesis Contribution to the Field/ Significance and /or Impact of the Research

You will need to explain the research significance, and locate it within the relevant literature. A convincing statement is required as to why your topic is worth scientific research, i.e. how it will contribute to and enrich the academic knowledge. This contribution results from your research activities, which are conducted to discover new information, as well as to expand and verify existing knowledge. You need to provide indication of how you feel your research can make an original contribution, how it may

fill gaps in existing work and how it may extend understanding of particular topics in your particular subject area.

The working paper by Dr. John Morrison [1] is a good resource for helping you understand what constitutes a contribution.

You should also relate the research to the existing specialties in the department in which you are studying and understanding of computing within your specific discipline (department specialty)

1.6 Thesis Outline

Let the reader know how the thesis is presented. It might be appropriate to provide a 1-2 sentence description of each chapter.

Chapter 2: Literature Review

2.1 Introduction

Introduction to the literature review as a whole.

The Literature Review serves several purposes. First of all, it demonstrates that you have built a solid knowledge of the field where the research is taking place, that you are familiar with the main issues at stake, and that you have critically identified and evaluated the key literature [2]–[4]. On the other hand, it shows that you have created an innovative and coherent view integrating and synthesizing the main aspects of the field, so that you can now put into perspective the new direction that you propose to explore. It should be accompanied by comprehensive references, which you list at the end of the thesis. The number of references may vary depending on the subject but in general it should be no less than 60 references.

In this section you should demonstrate that you are aware of the issues raised in related literature. You should provide a description of recent academic research in your chosen focus area; including the below parts:

1. How other scholars have written about your topic: include the list of references to key texts and recently published articles should be made to convince that you appreciate their integrative relevance to your research area.

2. The range of methods/ theories used to scrutinize, analyze and or test data: *List the best methodologies and research techniques for your particular topic.* Justifies methodological choices.

3. How other scholars connect their specific research topics to larger issues, questions, or practices within the field.

4. Identify potential gaps in knowledge: illustrates the uniqueness, importance of and need for your particular project.

5. Establish a need for current and/or future research projects.

2.2 Next Section

Quick introduction to contents of section

2.2.1 Sub-section

2.2.1.1 *Maybe another sub-section*

But don't get too deep into subsequent sections. Think carefully about how far into sub-sections you need to go.

Before moving onto the next section, give a quick review and a teaser of what's to come. Think of this as a form of navigation for the reader.

2.3 Another Section

Introduce each new section to the reader, then use more sub-sections as required.

2.3.1 *Possible Sections or Sub-sections*

Depending on your discipline, some possible sections in this chapter might include:

- Theoretical framework
- Gaps in the literature
- The research questions
- Opportunities for contributions to knowledge

2.4 Conclusion to This Chapter

Give the reader a reminder of the key points for this chapter. Then, tell them what follows in the next chapter.

Chapter 3: Methodology 1

3.1 Introduction

Introduction to methods chapter

Think about research design.

- It's about the rigour!
- Ethics and reasoning
- Talk about WHY you did or did not do something

Justification, justification, justification!!

This is key to everything. Justify what/why you did or did not do what you did.

3.2 Section Header about Quotations

You must use quotation marks and parenthetical references to indicate words that are not your own. Put quotation marks around short quotes. Put long quotes in separate single-spaced paragraphs, indented up to 1 inch from the left margin (these are called block quotations). Kate Turabian, editor of official publications and dissertation secretary at the University of Chicago for over 25 years, distinguishes short and long quotes as follows:

> Short, direct prose quotations should be incorporated into the text of the paper and enclosed in double quotation marks: "One small step for man; one giant leap for mankind." But in general a prose quotation of two or more sentences which at the same time runs to four or more lines of text in a paper should be set off from the text and indented in its entirety…[5]

3.3 Section Header about Figures

Figures should be inline with text and figure numbers should be includes the current chapter plus a sequence number. Copy this Figure to other places and modify the figures as well as the caption. The figure number will update automatically. If it does not, you can right click on the figure number and select "update".

Figure 33.1 You can left justify your figures.

Figures with multiple subfigures should be put in a table with hidden borders. Use the same numbering style for that includes the current chapter plus a sequence number. Make sure to center all cells in the table and also to hide the table borders.
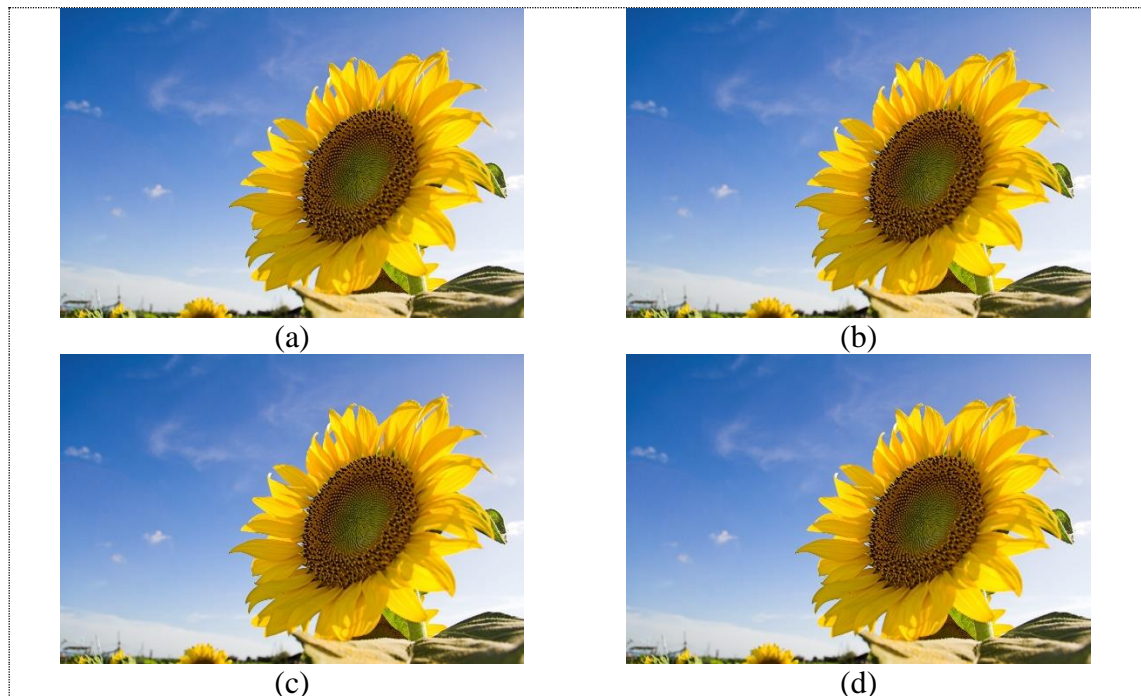

Figure 3.2 You should put a figures with multiple sub-figures in a table (centred). Then describe each part in the caption, (a) This figure talks about this, (b) this figure describes that, (c) this figure explains these, (d) this figure is the ultimate truth.

3.4   Section Header about Tables

Table captions should be above the table. Avoid using vertical lines as they are not aesthetically pleasing.

Table 3-1: *This is the table caption.*

Protocol	Port	Philosophy
HTTP	80	Transfer HTML-based documents
MQTT	1883	Transfer byte-based messages

3.4.1   Sub-section about Equations

Equations should be put in a table with hidden borders. Use the same numbering style for equations as you would for figures and tables. Copy this equation table to other places and modify the equation inside it. Here is an example of an equation set in-line with a paragraph: $E = mc^2$. Here is an example equation placed in a separate paragraph:

$$E = mc^2 \tag{1.1}$$

3.5 Conclusion to This Chapter

Give the reader a reminder of the key points for this chapter. Then, tell them what follows in the next chapter.

$$E = mc^2 \tag{1.1}$$

Chapter 4: Another Chapter (Methodology 2?)

4.1 Introduction

4.2 Section

4.2.1 Sub-section

4.3 Conclusion to This Chapter

Give the reader a reminder of the key points for this chapter. Then, tell them what follows in the next chapter.

Chapter 5: Another Chapter (Discussion?)

5.1 Introduction

5.2 Section

5.2.1 Sub-section

5.3 Conclusion to This Chapter

Give the reader a reminder of the key points for this chapter. Then, tell them what follows in the next chapter.

Chapter 6: Conclusion and Future Work

6.1   Introduction

6.2   Section

Possible sections might include:

- Contributions to existing knowledge

- Future work

6.2.1   Sub-section

References

No introduction or additional text needed, just list your references. Formatting will vary based on norms and standards from your research area.

Your references should provide the reader with a good sense of your grasp on the literature and how you can contribute to it. A full list of references to key texts and articles must be included. Referencing should be done according to the APA referencing styles.

The most important thing regarding references is that you should start collecting and recording all details of your references using tools that help manage and organize your references such as Mendeley, EndNote, Reference Manager, Docear, Zotero, BibSonomy, etc.

1. المرجع كتاب لمؤلف واحد: يكتب اسم عائلة المؤلف، ثم الحرف الأول من اسمه الأول والثاني يليها نقطة ثم سنة النشر داخل قوسين ثم نقطة، ثم عنوان الكتاب كاملاً يليه نقطة، ثم المدينة ثم نقطتان، ودار النشر . **مثال ذلك:**

- Hadley, A. O. (2001). **Teaching Language in Context**. (3ed.), U.S.A: Heine & Heine.

2. المرجع كتاب لمؤلفين أو أكثر: يبدأ باسم العائلة للمؤلف الأول، ثم فاصلة ثم الاسم الأول أو الأحرف الأولى من الاسم الأول والثاني لنفس المؤلف إذا كان معروفاً، ويتبع ذلك اسم المؤلف الثاني، والثالث وبقية الأسماء بالطريقة ذاتها، ثم سنة النشر داخل قوسين، ثم نقطة. ثم عنوان الكتاب كاملاً Bold، يليه نقطة، ثم مكان النشر ثم نقطتين ثم الناشر يليه نقطة. **مثال:**

- Ornstein, Allan C. & Hankins, Francis P. (1993). **Curriculum Foundations.** Principles and Issues. Boston: Ellyn and bacon.

3. المرجع فصل من كتاب محرر: يكتب اسم عائلة المؤلف ثم الحرف الأول من اسمه الأول والثاني ثم نقطة، ثم سنة النشر داخل قوسين ثم نقطة، ثم عنوان الفصل كاملاً، ثم كلمة في (in) واسم المحرر، ثم مختصر (ed) بين قوسين، ثم عنوان الكتاب، وصفحات الفصل داخل قوسين، ثم نقطة ثم المدينة ثم نقطتان ثم الناشر . **مثال ذلك:**

- Booth -Laforce, C. & Kerns, K. A. (2009). **Child-Parent Attachment Relationships, Peer Relationships, and Peer-Group Functioning.** In K. H. Rubin. M. B, W. M. Murkowski & B. Laursen (Eds.), Handbook of Peer Interactions, Relationships and Groups (pp.490-507). New York, NY: Guilford Press.

4. المرجع كتاب أعدته مؤسسة: يكتب اسم المؤسسة مكان عائلة المؤلف واسمه ثم نقطة، ثم سنة النشر داخل قوسين ثم نقطة بعد القوس، ثم عنوان الكتاب كاملاً ثم نقطة، ثم مكان النشر يليه نقطتان رأسيتان ثم الناشر . **مثال ذلك:**

- Institute of Financial Education. (1982). **Managing Personal Funds**. Chicago: Midwestern.

5. المرجع كتاب أعده محرر: يكتب اسم عائلة المحرر، والحرف الأول من اسمه، ثم تاريخ النشر داخل قوسين، ثم عنوان الكتاب ومكان النشر ودار النشر. **مثال ذلك:**

- Hallway, H. O. (ed.) (2003). **Work Psychology**. London: Sage.

6. المرجع بحث في دورية أجنبية لأكثر من مؤلف (من 2-6) يثبت جميعهم. مثال ذلك:

- Smadi, O. S. & Al- Ghazo, A. (2013). Jordanian Teachers, Attitudes toward Foreign Language Teaching and their Relationship to these Teachers Classroom Practices. **Journal of Eucation and Practice**, 4(17): 62-86.

7. المرجع بحث في دورية أجنبية لمؤلفين متعددين (7- فأكثر) يثبت أول ستة وآخر مؤلف منهم. مثال ذلك:

- Wolchik, S. A.; West, S. G.; Sandler, I. N.; Tein, J. Y.; Coatsworth. D.; Lengua, LGriffin, W. A. (2000). An experimental Evaluation of Theory- Based Mother-Child Programs for Children of Divorce. **Journal of Consulting and Clinical Psychology**, 68: 843-856.

8. المرجع بحث في أعمال مؤتمر لباحثين: يكتب اسم عائلة كل باحث ثم الحرف الأول والحرف الثاني من الاسم الأول والثاني لكل من الباحثين، ثم سنة إعداد البحث داخل قوسين، ثم عبارة بحث مقدّم إلى المؤتمر. **مثال ذلك:**

- Deci, E. I. & Ryan, R. M. (1991). **A motivational Approach to Self: Integration in Personality.** In Nebraska Symposiums on Motivation: Perspectives on Motivation (237-288). Lincoln: University of Nebraska Press.

9. المرجع أطروحة دكتوراه غير منشورة: يكتب اسم عائلة الباحث والحرف الأول من الاسم الأول والثاني يليها نقطة، ثم سنة إعداد الأطروحة داخل قوسين يليه نقطة ثم عنوان الأطروحة، ثم عبارة أطروحة دكتوراه غير منشورة، ثم اسم الجامعة ومكانها.

Auther, A. A. (1978). The title of the thesis. (Un published Thesis), Name of Institution, Locati

مثال ذلك:

- Al-Jamal, A. A. (2009). **Listening Comprehension Processes, Strategies and Difficulties in Interactive Settings: A Case Study of Jordanian EFL Students.** (Unpublished Doctoral Dissertation), Yarmuke University, Irbid, Jordan.

10. المرجع مقالة منشورة في صحيفة يومية أجنبية: يجري التوثيق كما هو في الدورية، ويوضع تاريخ اليوم والشهر مع السنة داخل القوسين. **مثال ذلك:**

- Mathews, J.; Barrett, D.; & Brillman, D. (2005, may 16). Other Winning Equations. **Newsweek,** 145(20), 58-59.

11. المرجع مقالة في صحيفة يومية: بدون مؤلف وبدون صفحات توثيق كما في المثال:

- Generic Prozac Debuts. (2001, August 3). **The Washington Post,** pp. El, E4.

Appendix A: Title here

Appendix B: Title here

Appendix C: Title here

Author's Biographical Sketch

To insert Biographical Sketch text here, select this text and then either type the text you wish to use or paste text from another document, being sure to keep the text only and not the formatting from the previous document. To keep text only, choose Paste, and then from the drop-down box that will appear, choose the Keep Text Only option on the right, with the icon of a clipboard and the letter A.