Politehnica University
Timișoara
Faculty of Automation and Computers
Department of Computer and Information Technology

<Title: ...
If Necessary, the Title Can
Span Over More than One Row>

Bachelor Thesis

Candidate:
Name SURNAME

Supervisors:
Prof. dr. eng. **Name SURNAME**
Conf. dr. eng. **Name SURNAME**
Ș-l. dr. eng. **Name SURNAME**
As. dr. eng**. Name SURNAME**

Timișoara
2021

DECLARAŢIE DE AUTENTICITATE A LUCRĂRII DE FINALIZARE A STUDIILOR

Subsemnatul _____,
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CNP _____autorul lucrării_____
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elaborată în vederea susţinerii examenului de finalizare a studiilor de licență _____organizat de către Facultatea de Automatică și Calculatoare din cadrul Universităţii Politehnica Timişoara, sesiunea _____ a anului universitar_____, luând în considerare conţinutul art. 39 din RODPI – UPT, declar pe proprie răspundere, că această lucrare este rezultatul propriei activităţi intelectuale, nu conţine porţiuni plagiate, iar sursele bibliografice au fost folosite cu respectarea legislaţiei române şi a convenţiilor internaţionale privind drepturile de autor.

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Declaratia se completează *„de mână”* si se inserează în lucrarea de finalizare a studiilor, la sfârsitul acesteia, ca parte

Contents

List of figures

List of tables

1. Introduction

The thesis will be structures in chapters, subchapters, and optionally sub-subchapters. They should be numbered accordingly, e.g. chapter 1, subchapter 1.1, and sub-subchapter 1.1.1. This is the introduction chapter and uses a Heading1 style. The rest of the text is Times New Roman, 12pt, single line spacing, justified, black.

Subchapters should use a Heading2 style, like the one below. While the main text is written with a serif font (Times), titles should be written with fonts without serif (Arial, Calibri).

1.1. Problem Statement

You may add a 12pt spacing after a Heading1 (chapter), and 6pt spacing after a Heading2 (subchapter). Numbering a heading will indent it automatically. To achieve this on any heading you will write, you must:

1. Write the text in the heading.
2. Apply the heading style.
3. Remove any existing leading spaces then type, for example 1.1. (1 dot 1 dot) then press space. You will see that after the last dot (.) the text will be indented.

If you have any problems with the numbering of the heading, right click on the heading number (like 1.1.) and change the numbering value. Using heading will help you a lot since you can auto generate a table of contents.

1.2. Figures and Tables

Figures and Tables must be referenced from text at least once, always before appearing in the main body of the text. So, first reference your figure, then make sure you move it after that paragraph in text. A figure should not be more than 2 pages away from the point you first mention it.

Figure captions must be below the figure, while table captions must be above. References are done using the name of the figure/table. For example, we refer to Figure 1.

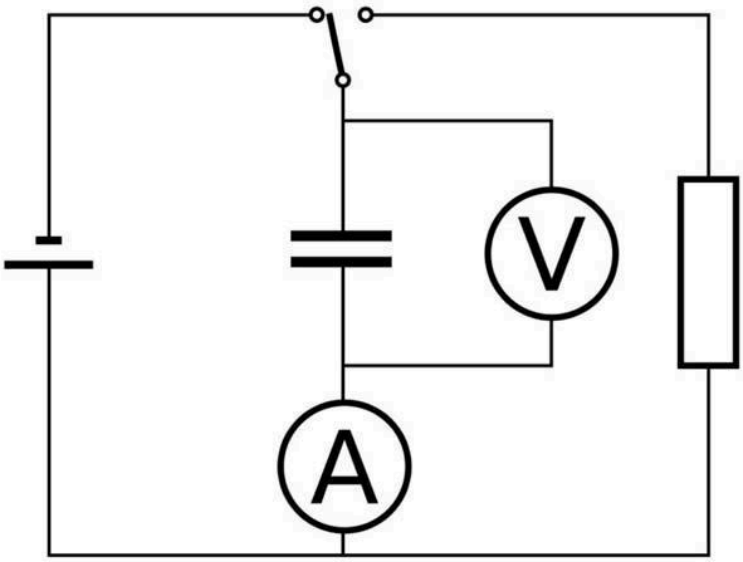

Figure 1. An example figure caption

Then, we also we refer to Table 1. These links will auto update if a new element is introduced or deleted before, and they are added from the references tab. As you can see, tables look best when left simple. The first column is usually aligned left, and the rest of the columns centered or aligned right. Add horizontal lines at the beginning, end and after the header. If needed, add other ones to delimit different entry categories.

Table 1. An example table caption.

ID	Minimum	Average	Maximum
A34	2	9	16
B56	3	12	25
C78	-3	5	8
D22	0	4	7.23

And so on.

2. State of the art

Describe the theoretic concepts on which you rely. Here go a lot of references, like for example about simulated annealing [1], [2]. References are detailed in the last section of the thesis, and are numbered with [x], starting from 1. They may be found by googling on scholar.google.com for particular research articles or books. When you find something of interest, just click the cite button and copy the "Chicago" reference style. It is common to refer to a bibliographic entry more than once.

Try to avoid other sources for citation, like URLs, tutorial sites, Google.com, Wikipedia.com. For example, Wikipedia can be a good source of finding which are the relevant papers and books in a domain. By searching, for example, after particle swarm optimization, you should find a few noteworthy authors. Copy the title of their work into Google Scholar to find the exact reference, then copy-paste the Chicago style text. Figures 2-4 exemplify this procedure.

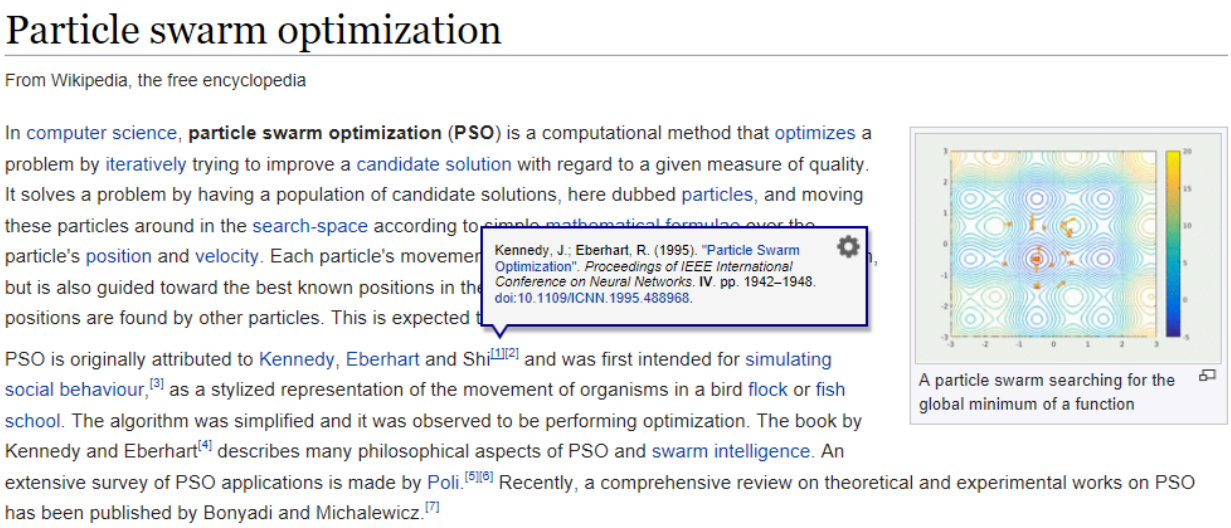

Figure 2. Search on Wikipedia and find relevant references

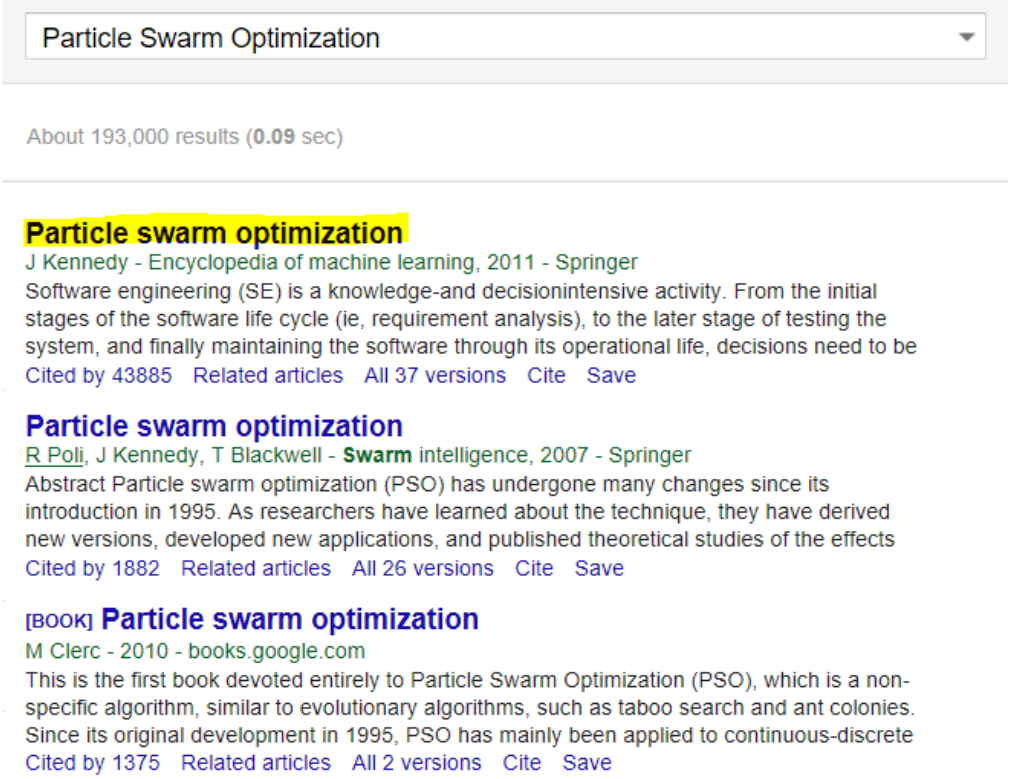

Figure 3. Search the scientific article based on title and author

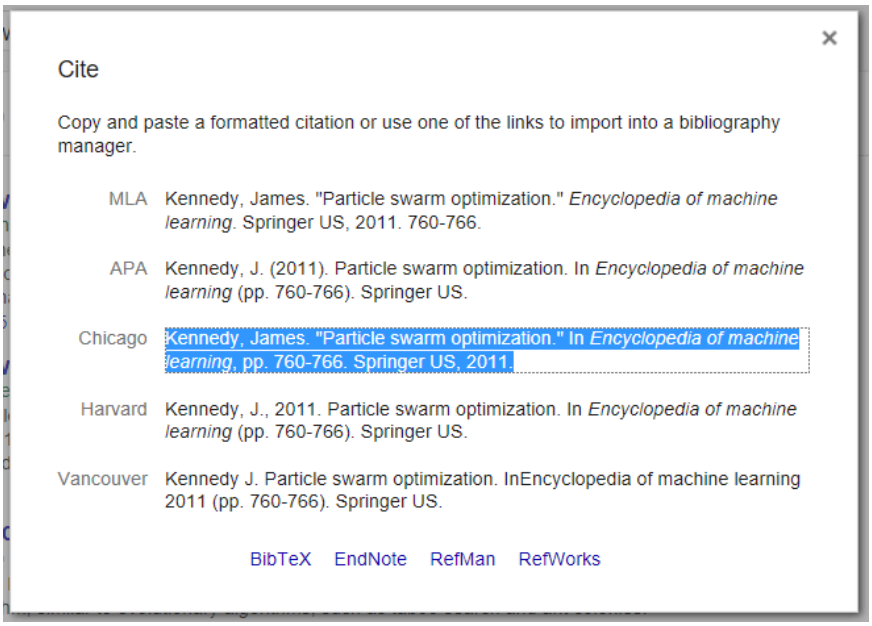

Figure 4. Copy the Chicago bibliographic style

Now, we have added the specific reference [3] to our bibliography.

3. Project specification

Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book. It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged. It was popularized in the 1960s with the release of letterset sheets containing Lorem Ipsum passages, and more recently with desktop publishing software like Aldus PageMaker including versions of Lorem Ipsum.

3.1. Requirements engineering

Contrary to popular belief, Lorem Ipsum is not simply random text. It has roots in a piece of classical Latin literature from 45 BC, making it over 2000 years old. Richard McClintock, a Latin professor at Hampden-Sydney College in Virginia, looked up one of the more obscure Latin words, consectetur, from a Lorem Ipsum passage, and going through the cites of the word in classical literature, discovered the undoubtable source. Lorem Ipsum comes from sections 1.10.32 and 1.10.33 of "de Finibus Bonorum et Malorum" (The Extremes of Good and Evil) by Cicero, written in 45 BC. This book is a treatise on the theory of ethics, very popular during the Renaissance. The first line of Lorem Ipsum, "Lorem ipsum dolor sit amet..", comes from a line in section 1.10.32.

3.2. System functionality

The standard chunk of Lorem Ipsum used since the 1500s is reproduced below for those interested. Sections 1.10.32 and 1.10.33 from "de Finibus Bonorum et Malorum" by Cicero are also reproduced in their exact original form, accompanied by English versions from the 1914 translation by H. Rackham.

3.3. Market and business analysis

It is a long established fact that a reader will be distracted by the readable content of a page when looking at its layout. The point of using Lorem Ipsum is that it has a more-or-less normal distribution of letters, as opposed to using 'Content here, content here', making it look like readable English. Many desktop publishing packages and web page editors now use Lorem Ipsum as their default model text, and a search for 'lorem ipsum' will uncover many web sites still in their infancy. Various versions have evolved over the years, sometimes by accident, sometimes on purpose (injected humour and the like).

4. Application design

4.1. System architecture

There are many variations of passages of Lorem Ipsum available, but the majority have suffered alteration in some form, by injected humour, or randomised words which don't look even slightly believable. If you are going to use a passage of Lorem Ipsum, you need to be sure there isn't anything embarrassing hidden in the middle of text. All the Lorem Ipsum generators on the Internet tend to repeat predefined chunks as necessary, making this the first true generator on the Internet. It uses a dictionary of over 200 Latin words, combined with a handful of model sentence structures, to generate Lorem Ipsum which looks reasonable. The generated Lorem Ipsum is therefore always free from repetition, injected humour, or non-characteristic words etc.

4.2. Components description

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4.3. Component interaction

"Sed ut perspiciatis unde omnis iste natus error sit voluptatem accusantium doloremque laudantium, totam rem aperiam, eaque ipsa quae ab illo inventore veritatis et quasi architecto beatae vitae dicta sunt explicabo. Nemo enim ipsam voluptatem quia voluptas sit aspernatur aut odit aut fugit, sed quia consequuntur magni dolores eos qui ratione voluptatem sequi nesciunt. Neque porro quisquam est, qui dolorem ipsum quia dolor sit amet, consectetur, adipisci velit, sed quia non numquam eius modi tempora incidunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim ad minima veniam, quis nostrum exercitationem ullam corporis suscipit laboriosam, nisi ut aliquid ex ea commodi consequatur? Quis autem vel eum iure reprehenderit qui in ea voluptate velit esse quam nihil molestiae consequatur, vel illum qui dolorem eum fugiat quo voluptas nulla pariatur?"

4.4. Use cases, sequence diagrams, class diagrams

"But I must explain to you how all this mistaken idea of denouncing pleasure and praising pain was born and I will give you a complete account of the system, and expound the actual teachings of the great explorer of the truth, the master-builder of human happiness. No one rejects, dislikes, or avoids pleasure itself, because it is pleasure, but because those who do not know how to pursue pleasure rationally encounter consequences that are extremely painful. Nor again is there anyone who loves or pursues or desires to obtain pain of itself, because it is pain, but because occasionally circumstances occur in which toil and pain can procure him some great pleasure. To take a trivial example, which of us ever undertakes laborious physical exercise, except to obtain some advantage from it? But who has any right to find fault with a man who chooses to enjoy a pleasure that has no annoying consequences, or one who avoids a pain that produces no resultant pleasure?"

5. Development and testing

5.1. Business logic

"On the other hand, we denounce with righteous indignation and dislike men who are so beguiled and demoralized by the charms of pleasure of the moment, so blinded by desire, that they cannot foresee the pain and trouble that are bound to ensue; and equal blame belongs to those who fail in their duty through weakness of will, which is the same as saying through shrinking from toil and pain. These cases are perfectly simple and easy to distinguish. In a free hour, when our power of choice is untrammelled and when nothing prevents our being able to do what we like best, every pleasure is to be welcomed and every pain avoided. But in certain circumstances and owing to the claims of duty or the obligations of business it will frequently occur that pleasures have to be repudiated and annoyances accepted. The wise man therefore always holds in these matters to this principle of selection: he rejects pleasures to secure other greater pleasures, or else he endures pains to avoid worse pains."

5.2. Data storage and processing

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5.3. User interface design

"At vero eos et accusamus et iusto odio dignissimos ducimus qui blanditiis praesentium voluptatum deleniti atque corrupti quos dolores et quas molestias excepturi sint occaecati cupiditate non provident, similique sunt in culpa qui officia deserunt mollitia animi, id est laborum et dolorum fuga. Et harum quidem rerum facilis est et expedita distinctio. Nam libero tempore, cum soluta nobis est eligendi optio cumque nihil impedit quo minus id quod maxime placeat facere possimus, omnis voluptas assumenda est, omnis dolor repellendus. Temporibus

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5.4. Security

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5.5. Test scenarios

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5.6. Configuration details

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5.7. Deployment and portability

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5.8. Scalability and performance perspectives

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6. Conclusions

6.1. Achievements

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6.2. State of the art comparison

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6.3. Future work

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References

[1] - Van Laarhoven, Peter JM, and Emile HL Aarts. "Simulated annealing." In Simulated Annealing: Theory and Applications, pp. 7-15. Springer Netherlands, 1987.

[2] - Aarts, Emile, Jan Korst, and Wil Michiels. "Simulated annealing." In Search methodologies, pp. 265-285. Springer US, 2014.

[3] - Kennedy, James. "Particle swarm optimization." In Encyclopedia of machine learning, pp. 760-766. Springer US, 2011.