MINISTRY OF EDUCATION AND RESEARCH

TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA

FACULTY OF AUTOMATION AND COMPUTER SCIENCE
COMPUTER SCIENCE DEPARTMENT

Continuous Improvement Process (CIP) Tool with Semantic Text Similarity Analysis

LICENSE THESIS

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Supervisor: As. Dr. Eng. Zoltán CZAKO

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MINISTRY OF EDUCATION AND RESEARCH

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Continuous Improvement Process (CIP) Tool with Semantic Text Similarity Analysis

1. **Project proposal:** *Short description of the license thesis and initial data*
2. **Project contents:** *(enumerate the main component parts) Presentation page, advisor's evaluation, title of chapter 1, title of chapter 2, ..., title of chapter n, bibliography, appendices.*
3. **Place of documentation:** *Example*: Technical University of Cluj-Napoca, Computer Science Department
4. **Consultants:**
5. **Date of issue of the proposal:** November 1, 2020
6. **Date of delivery:** July 1, 2021 *(the date when the document is submitted)*

Graduate: _____

Supervisor: _____

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Semnătura

De citit înainte (această pagină se va elimina din versiunea finală):

1. Cele trei pagini anterioare (foaie de capăt, foaie sumar, declaraţie) se vor lista pe foi separate (nu faţă-verso), fiind incluse în lucrarea listată. Foaia de sumar (a doua) necesită semnătura absolventului, respectiv a coordonatorului. Pe declaraţie se trece data când se predă lucrarea la secretarii de comisie.

2. Pe foaia de capăt, se va trece corect titulatura cadrului didactic îndrumător, în engleză (consultaţi pagina de unde aţi descărcat acest document pentru lista cadrelor didactice cu titulaturile lor).

3. Documentul curent **nu** a fost creat în MS Office. E posibil sa fie mici diferenţe de formatare.

4. Cuprinsul începe pe pagina nouă, impară (dacă se face listare faţă-verso), prima pagină din capitolul *Introducere* tot aşa, fiind numerotată cu 1.

5. E recomandat să vizualizaţi acest document şi în timpul editării lucrării.

6. Fiecare capitol începe pe pagină nouă.

7. Folosiţi stilurile predefinite (Headings, Figure, Table, Normal, etc.)

8. Marginile la pagini nu se modifică.

9. Respectaţi restul instrucţiunilor din fiecare capitol.

Contents

Chapter 1

Introduction - Project Context

1.1 Project context

With each passing day, the business market develops into a more and more competitive environment, forcing top companies around the globe to face the difficult challenge of increasing profitability by producing more and spending less, regardless whether the companies' endeavors focus on products or services. Nonetheless, boosting productivity, while also saving significant resources such as money or time, sounds far more simple than it actually is in a real-world scenario and may not even be enough to reach a greater profit.If the business wants to not only survive, but thrive and expand, it needs to consider a smarter approach in dealing with this issue, while at the same time invest more in quality, rather than quantity.

One solution to this issue lies in the Continuous Improvement Process (CIP), which came into existence after World War II in Japan, whose economy had been hit hard by the conflict which ended up in its defeat. As the United States wished for the nation to slowly rebuild after the devastation left by the war, the Americans put up a group of leading experts of their own, having proficiency in areas such statistics, and sent them to Japan to help them revive their economy. The strategy proposed by the experts meant shifting companies' focus on processes rather than outcomes and on the continual improvement of those processes, which could only be achieved by combining the efforts and involvement of every member of the organization in gradually correcting imperfections and, after all, growing the business. By the 1970s, many Japanese businesses had adopted this practise and began to see the benefits almost instantaneously, the most popular example being represented by Toyota Production System, which actually came up with its own approaches of continually improving processes, including JIT and Total Quality Management (TQM). Ever since, western companies took notice of the prosperity of Japanese organizations and began to show interest in this new way of handling the business and finally embraced it themselves.

All companies value their employees' ideas and consider them a source of continual improvement which represents the ongoing effort to improve product, services and pro-

cesses. However, the majority of those companies are currently providing rudimentary means to their employees for this process, such as Google Forms, Microsoft Forms or even e-mail.

1.1.1 Subsection

Each table used in this document is labeled as Table x.y, where x represents the chapter number, and y shows the table number within the current chapter. Leave a blank line between and after each table, relative to the adjacent paragraphs (table 1.1).

1.2 Short overview of the system

1.3 Short summary of the utilised technologies

Table 1.1: Nonlinear Model Results

Case	Method#1	Method#2	Method#3
1	50	837	970
2	47	877	230
3	31	25	415

Each figure used in the document must be cited within the text (ex: in figure x.y the system components are presented...) and labeled. The labeling must be as Figure x.y where x represents the chapter number, and y shows the number of the figure within the current chapter. E.g.: figure 1.1.

Each chapter must start on a new page.

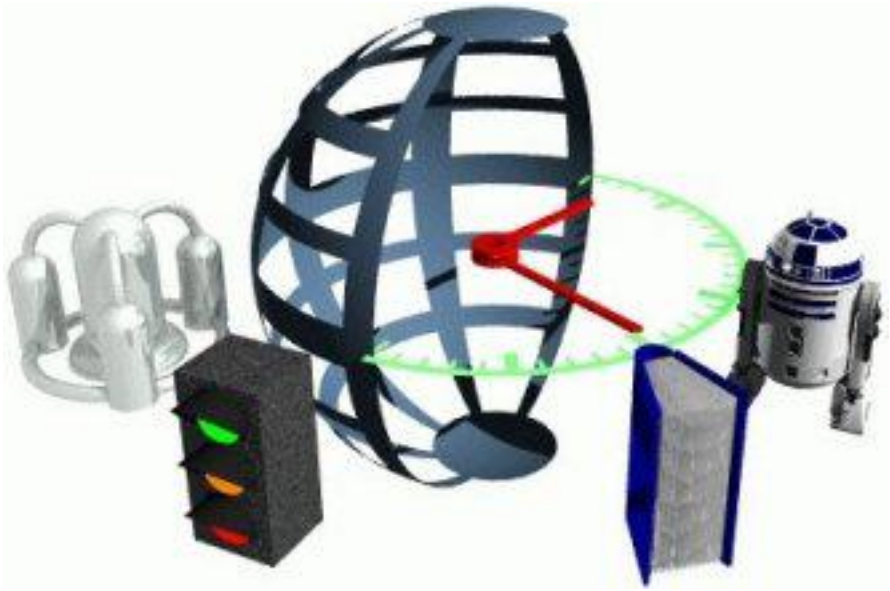

Figure 1.1: The figure‘s name

Chapter 2

Project Objectives and Specifications

Describe the proper theme (as a research/design proposal, clearly formulated, with clear objectives, and some explanatory figures).

Stretches over about 10% of the paper.

2.1 Machine Learning Application

2.1.1 Functional specifications

2.1.2 Non-functional specifications

2.2 Backend application

2.2.1 Functional specifications

2.2.2 Non-functional specifications

2.3 Web application

2.3.1 Functional specifications

2.3.2 Non-functional specifications

Chapter 3

Bibliographic research

3.1 Introduction in Natural Language Processing

3.2 Continuous Improvement Process Definition

3.3 Competitors and similar systems

Bibliographic research has as an objective the establishment of the references for the project, within the project domain/thematic. While writing this chapter (in general the whole document), the author will consider the knowledge accumulated from several dedicated disciplines in the second semester, 4^{th} year (Project Elaboration Methodology, etc.), and other disciplines that are relevant to the project theme.

Represents about 15% of the paper.

Each reference must be cited within the document text, see example below (depending on the project theme, the presentation of a method/application can vary).

This section includes citations for conferences or workshop [1], journals [2], and books [3].

In paper [2] the authors present a detection system for moving obstacles based on stereovision and ego motion estimation. The method is ... *discus the algorithms, data structures, functionality, specific aspects related to the project theme, etc....* Discussion: *pros and cons.*

In chapter 4 of [4], the *similar-to-my-project-theme algorithm* is presented, with the following features ...

Chapter 4

Analysis and Theoretical Foundation

Together with the next chapter takes about 60% of the whole paper

The purpose of this chapter is to explain the operating principles of the implemented application. Here you write about your solution from a theory standpoint - i.e. you explain it and you demonstrate its theoretical properties/value, e.g.:

- used or proposed algorithms
- used protocols
- abstract models
- logic explanations/arguments concerning the chosen solution
- logic and functional structure of the application, etc.

YOU DO NOT write about implementation.

YOU DO NOT copy/paste info on technologies from various sources and others alike, which do not pertain to your project.

4.1 Title

4.2 Other title

Chapter 5

Detailed Design and Implementation

Together with the previous chapter takes about 60% of the paper.

The purpose of this chapter is to document the developed application such a way that it can be maintained and developed later. A reader should be able (from what you have written here) to identify the main functions of the application.

The chapter should contain (but not limited to):

- a general application sketch/scheme,
- a description of every component implemented, at module level,
- class diagrams, important classes and methods from key classes.

Chapter 6

Testing and Validation

About 5% of the paper

6.1 Title

6.2 Other title

Chapter 7

User's manual

In the installation description section your should detail the hardware and software resources needed for installing and running the application, and a step by step description of how your application can be deployed/installed. An administrator should be able to perform the installation/deployment based on your instructions.

In the user manual section you describe how to use the application from the point of view of a user with no inside technical information; this should be done with screen shots and a stepwize explanation of the interaction. Based on user's manual, a person should be able to use your product.

7.1 Title

7.2 Other title

Chapter 8

Conclusions

About. 5% of the whole
Here your write:

- a summary of your contributions/achievements,
- a critical analysis of the achieved results,
- a description of the possibilities of improving/further development.

8.1 Title

8.2 Other title

Bibliography

[1] E. Bellucci, A. Lodder, and J. Zeleznikow, "Integrating artificial intelligence, argumentation and game theory to develop an online dispute resolution environment." in *16th International Conference on Tools with Artificial Intelligence*, 2004, pp. 749–754.

[2] G. Antoniou, T. Skylogiannis, A. Bikakis, M. Doerr, and N. Bassiliades, "Dr-brokering: A semantic brokering system." *Knowledge-Based Systems*, vol. 20, no. 1, pp. 61–72, 2007.

[3] S. J. Russell, P. Norvig, J. F. Canny, J. M. Malik, and D. D. Edwards, *Artificial intelligence: a modern approach*. Prentice hall Englewood Cliffs, 1995, vol. 2.

[4] W. Strunk, Jr. and E. B. White, *The Elements of Style*, 3rd ed. Macmillan, 1979.

Appendix A

Relevant code

```
 /** Maps are easy to use in Scala. */
object Maps {
  val colors = Map("red" -> 0xFF0000,
                   "turquoise" -> 0x00FFFF,
                   "black" -> 0x000000,
                   "orange" -> 0xFF8040,
                   "brown" -> 0x804000)
  def main(args: Array[String]) {
    for (name <- args) println(
      colors.get(name) match {
        case Some(code) =>
          name + " has code: " + code
        case None =>
          "Unknown color: " + name
      }
    )
  }
}
```

Appendix B

Other relevant information (demonstrations, etc.)

Appendix C

Published papers