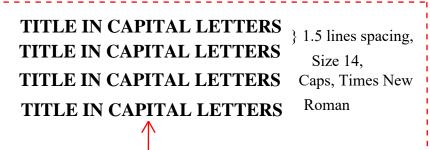
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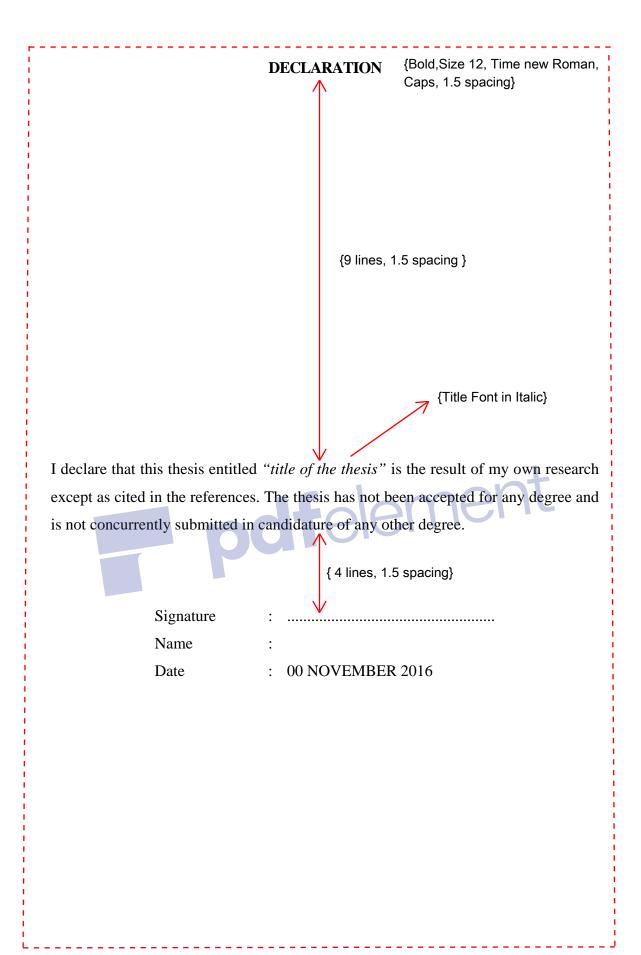
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DEDICATION {Bold,Size 12, Time new Roman, Caps, 1.5 spacing}

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This thesis is dedicated to my father, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is also dedicated to my mother, who taught me that even the largest task can be accomplished if it is done



ACKNOWLEDGEMENT {Bold, Size 12, Time new Roman,

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In preparing this thesis, I was in contact with many people, researchers, { spacing academicians, and practitioners. They have contributed towards my understanding single line, and thoughts. In particular, I wish to express my sincere appreciation to my main Time new Roman) thesis supervisor, Professor Dr. A. A. A for encouragement, guidance, critics and friendship. I am also very thankful to my co-supervisor Professor Dr A. H. A and Associate Professor Dr. H. J for their guidance, advices and motivation. Without their continued support and interest, this thesis would not have been the same as presented here.
{ONE ENTER}

I am also indebted to University of Technology (UOT), Applied Science Department for funding/supporting my Ph.D/MS.c study. Librarians at UOT, university of Baghdad, and Universiti Teknologi Malaysia (UTM) also deserve special thanks for their assistance in supplying the relevant literatures.

My fellow postgraduate student should also be recognised for their support. My sincere appreciation also extends to all my colleagues and others who have provided assistance at various occasions. Their views and tips are useful indeed. Unfortunately, it is not possible to list all of them in this limited space. I am grateful odfelemer ... to all my family member.

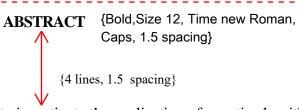
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For master students the maximum words 300 words.

single or one and a half spacing..

For Ph.D students the maximum words 500.



The purpose of this study is to investigate the application of genetic algorithm (GA) in modelling linear and non-linear dynamic systems and develop an alternative model structure selection algorithm based on GA. Orthogonal least square (OLS), a gradient descent method was used as the benchmark for the proposed algorithm. A model structure selection based on modified genetic algorithm (MGA) has been proposed in this study to reduce problems of premature convergence in simple GA (SGA). The effect of different combinations of MGA operators on the performance of the developed model was studied and the effectiveness and shortcomings of MGA were highlighted. Results were compared between SGA, MGA and benchmark OLS method. It was discovered that with similar number of dynamic terms, in most cases, MGA performs better than SGA in terms of exploring potential solution and outperformed the OLS algorithm in terms of selected number of terms and predictive accuracy. In addition, the use of local search with MGA for fine-tuning the algorithm was also proposed and investigated, named as memetic algorithm (MA). Simulation results demonstrated that in most cases, MA is able to produce an adequate and parsimonious model that can satisfy the model validation tests with significant advantages over OLS, SGA and MGA methods. Furthermore, the case studies on identification of multivariable systems based on real experiment t al data from two systems namely a turbo alternator and a continuous stirred tank reactor showed that the proposed algorithm could be used as an alternative to adequately identify adequate and parsimonious models for those systems. Abstract must be bilingual. For a thesis written in Bahasa Melayu, the abstract must first be written in Bahasa Melayu and followed by the English translation. If the thesis is written in English, the abstract must be written in English and followed by the translation in Bahasa Melayu. The abstract should be brief, written in one paragraph and not exceed one (1) page. An abstract is different from synopsis or summary of a thesis. It should

states the field of study, problem definition, methodology adopted, research process, results obtained and conclusion of the research. The abstract can be written using

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500 words maximum for Ph.D

300 words maximum for Master



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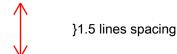


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LIST OF ABBREVIATIONS



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ANN - Artificial Neural Network

GA - Genetic Algorithm

PSO - Particle Swarm Optimization
MTS - Mahalanobis Taguchi System

MD - Mahalanobis Distance

TM - Taguchi Method

UTM - Universiti Teknologi Malaysia
 XML - Extensible Markup Language
 ANN - Artificial Neural Network

GA - Genetic Algorithm

PSO - Particle Swarm Optimization



LIST OF SYMBOLS



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 δ - Minimal error

D,d - Diameter

F - Force

v - Velocity
p - Pressure

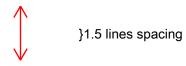
I - Moment of Inersia

r - Radius

Re - Reynold Number







APPENDIX TITLE PAGE

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CHAPTER 1

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INTRODUCTION

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Video provides a powerful way to help you prove your point. When you click Online Video, you can paste in the embed code for the video you want to add. You can also type a keyword to search online for the video that best fits your document. To make your document look professionally produced, Word provides header, footer, cover page, and text box designs that complement each other. For example, you can add a matching cover page, header, and sidebar. "For the thesis paragraphs, use

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1.2 Problem Background

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need them. To change the way a picture fits in your document, click it and a button for layout options appears next to it. When you work on a table, click where you want to add a row or a column, and then click the plus sign.

1.3 Problem Statement

1.4 Research Goal

1.4.1 Research Objectives

The objectives of the research are:

- (a) To estimate the parameters
- (b) Item 1
- (c) Item 2
- (d) To define the best parameter estimate.

1.5 Captions

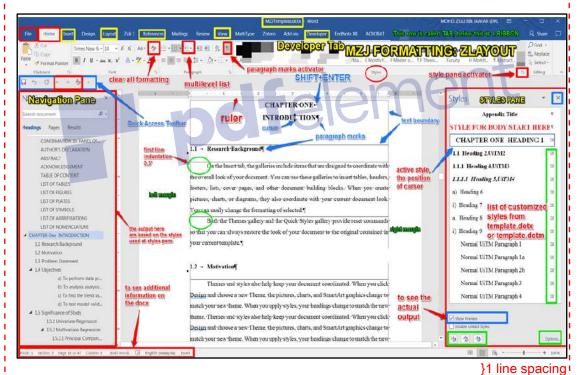


Figure 1.1 Trends leading to the problem using MZJ Formatting Method.

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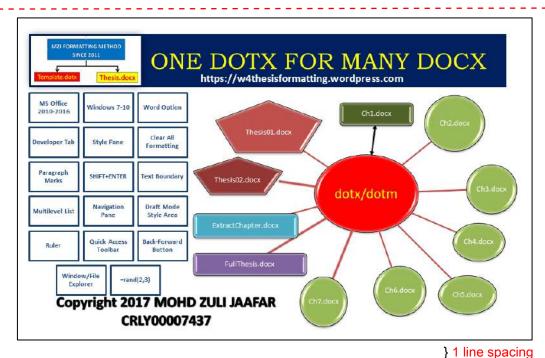


Figure 1.2 Design and development phases of the proposed scheme [1]

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Table 1.1 The role of statistical quality engineering tools and methodologies

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Table 1.2 Basic ANN models used for control chart pattern recognition

(If the caption is written more than one line, use 1.5 line)

1.6 Quotation } 1.5 line spacing

After deliberating on doctoral education in Australia in the 1990s, one observer I Australia writes:

The lack of any significant formal course work within our Ph.D. and master degrees by research has continued for three decades. The focus of our Ph.D. research type degrees continues to be the research project, and this is almost the only medium by which education is accomplished.

1.7 Equation

y = mx + c Spacing (1.1)

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CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

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- Figure 2.1 Continuous variability reduction using SPC chart (Revelle and Harrington, 1992)
- Figure 2.2 Typical fully developed patterns on Shewhart control chart (Cheng, 1989)
- Table 2.1 Regression analysis for the results of preliminary feature screening
- Table 2.2 Estimated effects and regression coefficients for the recogniser's performance (reduced model)

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2.1.1 State-of-the-Arts

2.2 Limitation

2.3 Research Gap

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CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

On the Insert tab, the galleries include items that are designed to coordinate with the overall look of your document. You can use these galleries to insert tables, headers, footers, lists, cover pages, and other document building blocks. When you create pictures, charts, or diagrams, they also coordinate with your current document look. You can easily change the formatting of selected text in the document text by choosing a look for the selected text from the Quick Styles gallery on the Home tab.

3.1.1 Proposed Method

On the Insert tab, the galleries include items that are designed to coordinate with the overall look of your document. You can use these galleries to insert tables, headers, footers, lists, cover pages, and other document building blocks. When you create pictures, charts, or diagrams, they also coordinate with your current document look. You can easily change the formatting of selected text in the document text by choosing a look for the selected text from the Quick Styles gallery on the Home tab.

3.1.1.1 Research Activities

On the Insert tab, the galleries include items that are designed to coordinate with the overall look of your document [1]. You can use these galleries to insert tables, headers, footers, lists, cover pages, and other document building blocks. When you create pictures, charts, or diagrams, they also coordinate with your current document look. You can easily change the formatting of selected text in the document text by choosing a look for the selected text from the Quick Styles gallery on the Home tab.

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3.2 Tools and Platforms

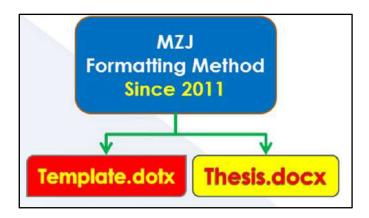


Figure 3.1 Example of Formatting Method.

3.3 Chapter Summary

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CHAPTER 4

PROPOSED WORK

4.1 The Big Picture

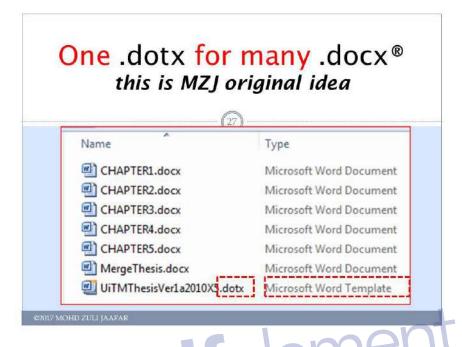


Figure 4.1 This is MZJ original idea.

4.2 Analytical Proofs

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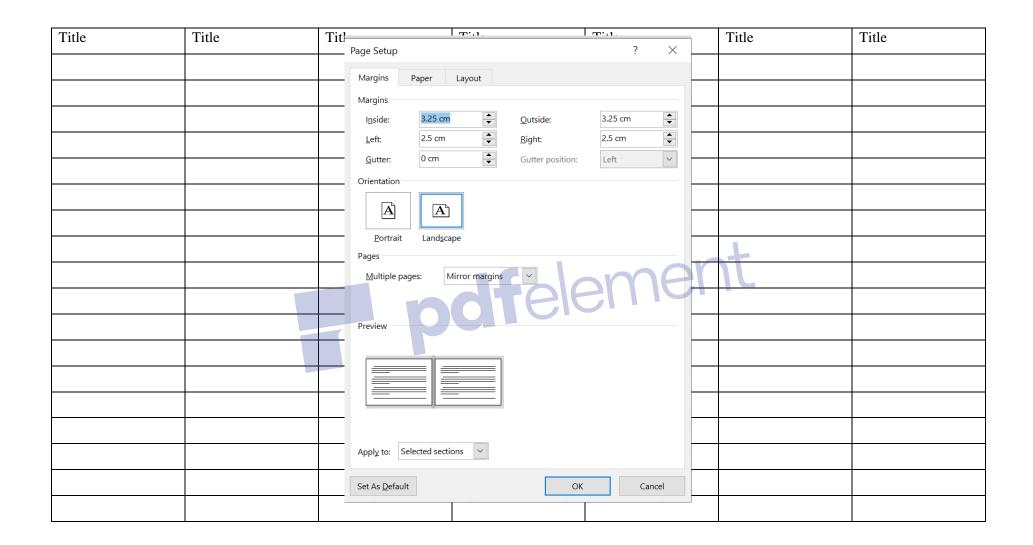
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4.3 Result and Discussion



Figure 4.2 The method for high performance formatting.

4.4 Chapter Summary



CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

- **5.1** Research Outcomes
- **5.2** Contributions to Knowledge
- **5.3** Future Works

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References writing style

1- *Book*

Author. *Title of the book*. Edition (if not the first). Place published: Publisher. Year

Example:

Theusen, G. J. and Fabrycky, W. J. *Engineering Economy*. 6th ed. Englewood Cliffs, N. J.: Prentice-Hall. 1984

2- Article in a book

Author. Title of the article. In: Author of the book. *Title of the book*. Place published: Publisher. page; year.

Example:

Hussein, S. B., Jamaluddin, H., Mailah, M. and Zalzala, A. M. S. An Evolutionary Neural Network Controller for Intelligent Active Force Control. In: Parmee, I. C. ed. *Evolutionary Design and Manufacturing*. London: Springer-Verlag. 351-362; 2000

3- Conference articles

Author. Title of the article. *Name of the conference*. Date of the conference. Place published: Publisher. Year. page.

Example:

Sheta, A. F. and De Jong, K. Parameter Estimation of Nonlinear Systems in Noisy Environments Using Genetic Algorithms. *Proceedings of the 1996 IEEE International Symposium on Intelligent Control*. September 15-18,1996. Dearborn, Michigan: IEEE. 1996. 360-365.

4- Standards

Name of the Institution. *Title of the standard*. Place published, Standard number. Year

Example:

British Standards Institution. *Tongued and Grooved Software Flooring*. London, BS 1297. 1987

5- Patent

Owner's name. Title of the patent. Patent number. Year.

Example:

Lindgren, E. A. Screen Room Air Inlet and Wave Guard. V.S. Patent 2, 925,457. 1960.

6- Thesis

Author. Title of the thesis. Thesis award. Name of Institution; Year

Example:

Ahmed Mohammed. On-line Recognition of Developing Control

Chart Patterns. Ph.D. Thesis. University of Technology - Iraq; 2002

7- Newspaper article

Print Format Gearing up to meet new challenges. (2000,

a. No Author February 22) *The Star.* 2.

b. With author Izatun Shari (2000, April 18) K-economy: draft

out in October. New Straits Times. 2-4.

8- Magazine

Author. (Year) Title of article. Name of magazine, Volume/Issue no., page

Example:

Smith, B. L. 1994). Biofeedback. Science, 62, 673 - 675.

9- Journal Articles

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