بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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MONA MAGHRABY

DESIGNING OF FUZZY LOGIC BASED COMPUTED TORQUE CONTROLLERS FOR 6 DEGREE OF FREEDOM ROBOTIC MANIPULATOR

By

Asmaa Mohamed Abd El-Star

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
In
ELECTRICAL POWER AND MACHINES ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:

DESIGNING OF FUZZY LOGIC BASED COMPUTED TORQUE CONTROLLERS FOR 6 DEGREE OF FREEDOM ROBOTIC MANIPULATOR

Key Words:
Robotic manipulators; Computed torque control; Fuzzy control

Summary:
Three different control strategies have been developed to control the 6-degree of freedom. Robot manipulator such that it can track the required trajectories. The first is based on the feedback linearization of the manipulator and controller via using a nonlinear control law. This is called a computed-torque-controller (CTC). The second is a Fuzzy controller. The third is a hybrid controller from the first and the second ones. The developed controllers are tested in different cases of uncertainties in the nonlinearity of the manipulator. The third

controller has proved its superiority over the other two controllers in case of the motion is either from point to point or oscillatory with small frequency.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Asmaa Mohamed Abd El-star Date: ../../…

Signature:

Dedication

To my mother and my husband. Without whom this work would not have been completed.

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First of all, thanks god for helping me throughout my whole life. All praise is due to Allah who guided me to this.

I would like to thank Prof. Dr. Ahmed Kamel. He has been very supportive and has always provided me with the encouragement and advice to finish my work. I think that he has a serious personality. I learned great lessons from this serious and organized personality.

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To the candle that lights the path of my life, for my mother who built me to be as I am, thesis dedication is not enough to thank her.

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Contents

DISCLAIMER ……………………………………………………………………I

DEDICATION…... II

ACKNOWLEDGMENTS...III

LIST OF TABLES VI

LIST OF FIGURES VII

ABSTRACT……... X

CHAPTER 1 : INTRODUCTION... 1

1.1. INTRODUCTION:.. 1
1.2. BASIC COMPONENT OF A ROBOT 1
1.3. ROBOT CLASSIFICATIONS.. 3

1.3.1. CLASSIFICATION BY DEGREE OF FREEDOM (DOF): 3

1.3.2. CLASSIFICATION BY COORDINATE SYSTEM:.................. 5

1.3.3. CLASSIFICATION BY CONTROL METHOD: 8

1.4. MOTIVATION 8
1.5. LITERATURE REVIEW 9
1.6. THESIS OBJECTIVES.. 11
1.7. THESIS OUTLINE 11

CHAPTER 2 : ROBOT KINEMATICS AND DYNAMIC MODELLING........... 12

2.1. INTRODUCTION:... 12
2.2. ROBOT KINEMATICS:.. 12

2.2.1. FORWARD KINEMATICS: 13

2.2.1.1. ASSIGNING THE COORDINATE FRAMES AND DH PARAMETERS: 13

2.2.1.2. DERIVATION OF LINK TRANSFORMATIONS MATRICES:….. 15

2.2.2. INVERSE KINEMATICS: 16

2.3. ROBOT DYNAMICS:.. 18

2.3.1. LAGRANGE-EULER (L-E) EQUATION: 19

2.4. SUMMARY 20

CHAPTER 3 : PROPOSED ROBOT CONTROLLERS 21

3.1. INTRODUCTION 21
3.2. COMPUTED TORQUE CONTROLLER 21

3.2.1. COMPUTED TORQUE CONTROL (CTC) IMPLEMENTATION 22

3.3. FUZZY LOGIC SYSTEM 25

3.3.1. FUZZY CONTROLLER 25

3.3.2. FUZZY CONTROLLER IMPLEMENTATION: 26

3.4. COMPUTED TORQUE CONTROLLER PLUS FUZZY COMPENSATOR: 29

3.4.1. CTC PLUS FC COMPENSATOR DERIVATION AND IMPLEMENTATION: 29

3.5. SUMMARY: 33

CHAPTER 4 : SIMULATION RESULTS 34

4.1. INTRODUCTION: 34

4.2. STEP INPUT: 34

4.2.1. SYSTEM NONLINEARITY IS EQUAL TO CONTROLLER NONLINEARITY ($SN = CN$): 34

4.2.2. SYSTEM NONLINEARITY IS NOT EQUAL TO CONTROL NONLINEARITY ($SN = 0.3CN$): 38

4.3. SIN INPUT: 42

4.3.1. MANIPULATOR RESPONSE FOR SINUSOIDAL INPUT WITH FREQUENCY = 0.5 RAD/SEC: 42

4.3.2. MANIPULATOR RESPONSE FOR SINUSOIDAL INPUT WITH FREQUENCY = 1 RAD/SEC 49

4.3.3. MANIPULATOR RESPONSE FOR SINUSOIDAL INPUT WITH FREQUENCY = 3 RAD/SEC : 56

4.4. SUMMARY: 62

CHAPTER 5 : CONCLUSIONS AND FUTURE WORK 63

5.1. CONCLUSIONS 63

5.2. FUTURE WORK 63

BIBLIOGRAPHY 64

APPENDIX A…… 67

List of Tables

Table 1.1 Types of joints.. **Error! Bookmark not defined.**
Table 2.1 DH parameter for PUMA 560 robot arm...... **Error! Bookmark not defined.**
Table 2.2 Link lengths…………………………………………………………...25
Table 3.1: Fuzzy control rule bases…...….39
Table 4.1 Position of the end effector and Error in all controllers in case of ($\boldsymbol{S_N = C_N}$) and step input………………………………………………………………………..48
Table 4.2 Position of the end effector and Error for all controllers in case of ($\boldsymbol{S_N \neq C_N}$) and step input………………………………………………………………………..52

List of Figures

Figure 1.1 The cylindrical manipulator…….……………………………………….15
Figure 1.2 Workspace of cylindrical manipulator……………………………….15
Figure 1.3 The spherical manipulator……………………..………………..16
Figure 1.4 Workspace of spherical manipulator…………………………….....16
Figure 1.5 The revolute manipulator……………………….………………17
Figure 1.6 Workspace of the revolute manipulator……………………………...17
Figure 1.7 The cartesian manipulator……………………..……………………17
Figure 1.8 Workspace of cartesian manipulator…………………………..……..18
Figure 2.1 Kinematics block diagram………………………..……………...24
Figure 2.2 Frame assignment for the PUMA 560 manipulator……………………….25
Figure 3.1 Block diagram of PD-computed torque controller…………………..…….33
Figure 3.2 PD controller…..………………………………………………………..34
Figure 3.3 PD-CTC……....…………………………………………………………34
Figure 3.4 Dynamic parameters blocks (N)……………………………………..……35
Figure 3.5 Overall system blocks…………………………..……………………….35
Figure 3.6 Fuzzy Control System……………………………………………………..36
Figure 3.7 Error…………………………………………………………………………..38
Figure 3.8 Delta error………………………………………………………………….38
Figure 3.9 Torque……………………………………………………………………...38
Figure 3.10 Fuzzy Inference Block……………...……………………………………39
Figure 3.11 Fuzzy controller for link…………….……………………………………39
Figure 3.12 Overall fuzzy system blocks………………………..…………………..40
Figure 3.13 CTC and Fuzzy compensator controllers…………………………………43
Figure 3.14 Diagram of closed loop system……………………………………………..43
Figure 4.1 Comparison of all controllers for joint 1 in case of $(S_N = C_N)$ and step input……………………………………………………………………………………45
Figure 4.2 Comparison of all controllers for joint 2 in case of $(S_N = C_N)$ and step input……………………………………………………………………………………46
Figure 4.3 Comparison of all controllers for joint 3 in case of $(S_N = C_N)$ and step input……………………………………………………………………………………46
Figure 4.4 Comparison of all controllers for joint 4 in case of $(S_N = C_N)$ and step input…………………………………………………………………………………...47
Figure 4.5 Comparison of all controllers for joint 5 in case of $(S_N = C_N)$ and step input……………………………………………………………………………………47
Figure 4.6 Comparison of all controllers for joint 6 in case of $(S_N = C_N)$ and step input……………………………………………………………………………………48
Figure 4.7 Comparison of all controllers for joint 1 in case of $(S_N \neq C_N)$ and step input……………………………………………………………………………………49
Figure 4.8 Comparison of all controllers for joint 2 in case of $(S_N \neq C_N)$ and step input……………………………………………………………………………………50
Figure 4.9 Comparison of all controllers for joint 3 in case of $(S_N \neq C_N)$ and step input……………………………………………………………………………………50
Figure 4.10 Comparison of all controllers for joint 4 in case of $(S_N \neq C_N)$ and step input……………………………………………………………………………………51
Figure 4.11 Comparison of all controllers for joint 5 in case of $(S_N \neq C_N)$ and step input……………………………………………………………………………………51