سامية محمد مصطفى

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

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شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

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سامية محمد مصطفى

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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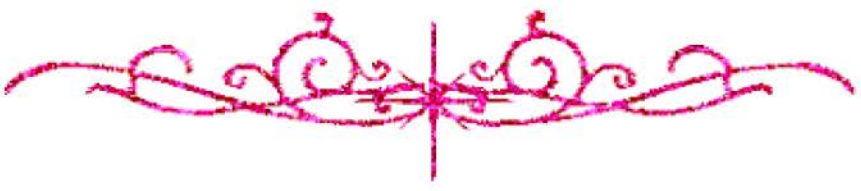

سامية محمد مصطفى

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بالرسالة صفحات لم ترد بالأصل

ROBOT MOTION CONTROL FOR A MOBILE ROBOT BY FUZZY LOGIC

By

Eng. HUSSAM MUHAMMED ELBEHIERY

A thesis Submitted to the
Faculty of Engineering at Zagazig University
(Benha branch) Shubra in Partial Fulfillment for the
Degree of
MASTER OF SCIENCE
in
Electronic Engineering

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July 2001

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Robot motion control for a Mobile Robot by Fuzzy Logic

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بسم الله الرحمن الرحيم

و قالوا سبحانك لا علم لنا إلا ما

علمتنا انك انت العليم الحكيم

صدق الله العظيم

سورة البقرة - الآية ٣٢

ACKNOWLEDGEMENT

I would like to take this opportunity to express my gratitude and indebtedness to my research supervisors **Ass. Prof. Dr. Mohamed Tarek Elewa** and **Dr. Ashraf Muhammed Hafez** for their continuous guidance, patience and support throughout my postgraduate study. Their valuable constructive suggestions pertaining to the research and their efforts in reviewing the manuscript are sincerely appreciated.

Special thanks for **Dr. Adly Tag Eldien** who put me on the first step in this thesis.

I would also like to dedicate this work to my parents, and my twin brother for their continuous encouragement and spiritual support from beginning to end.

ABSTRACT

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The thesis manipulates the problems of applying fuzzy logic theory to solve the motion control problem for a Mobile Robot.

In order to achieve optimum performance, it was essential for integrated merging with the human experts that can be achieved using fuzzy logic control for motion of MR.

The fuzzy logic control provides an algorithm, which can convert the linguistic control strategy, based on expert knowledge into an intelligent control strategy, which will be taken in the contents of the next chapters in details.

Starting in the first chapter with introduction demonstrating the importance and application areas of Mobile robots, also including a survey of motion control techniques for Mobile robots.

Introducing fuzzy logic systems and its classification, design of Fuzzy Logic Controller (FLC) handling its advantages over conventional controllers; and how to apply fuzzy logic to control the motion of an experimental Mobile robot Mobile robot explained in the next chapter.

Robotic architecture and its hardware including mechanical construction, types of motors used, motion control card, power circuit, speed measurement circuit demonstrated in third chapter.

Chapter four discusses the control action for the Mobile robot. It contains the design of the microcontroller-based H/W used and the applied control algorithm. It also discusses the sampling period selection and motors speed measurement technique.

Experimental work, results, and its discussion explained in the fifth chapter including tuning of fuzzy control system parameters, system analysis and program flowcharts used. Finally, Presenting conclusion and suggestions for future work, ending by the control program listing has been given in the appendices also the references used.

LIST OF CONTENTS