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DEDICATION

Dedicated to
My Father Elfadel Haroon Ahamed

A CKNOWLEDGEMENT

O my lord! So order that I may be grateful for thy favors, which thou has bestowed on me and on my parents, and that I may work the righteousness that will please thee.

I would like to thank all those who supported me, my mother, my father, my brothers, and my sisters. Special thanks are due to my Supervisor/

Head of Electrical Engineering Department, Sudan University: Dr. Martino Ojwok Ajang, for his supporting me. I greatly express my thanks to all persons whom supported me in preparing this research.

ABSTRACT

Fuzzy control systems have been successfully applied to a wide variety of practical problems. It has been shown that these controllers may perform better than conventional controllers, especially when applied to processes difficult to model, with nonlinearities, and when there is heuristic knowledge from human operators. Direct Current (DC) motor has been used because it is one of the most common actuator used in control system.

The main objective of this research is to control the speed of DC motor using fuzzy logic controller. Firstly, speed has been controlled with Proportional –Integral –Derivative (PID) controller and simulated the model by using MATLAB/SIMULINK.

In this research the design and implementation of the fuzzy logic speed controller for the DC motor have been accomplished by using Fuzzy Logic Toolbox (FLT) in MATLAB/SIMULINK. Simulation results have been presented.

انظمة التحكم الغامض طبقت بنجاح على مجموعة واسعة من المشاكل العملية. ولقد ثبت أن أداء هذه المتحكمات أفضل من أداء المتحكمات التقليدية، وخصوصاً عندما تطبق على عمليات ذات طبيعة لا خطية. مع صعوبة إيجاد النموذج لها، وعندما يكون هناك حاجة لمعرفة مجريات الأمور من العاملين من البشر. وقد استخدم محرك التيار المستمر لأنه واحد من أكثر المشغلات شيوعاً في أنظمة التحكم. والهدف الرئيسي من هذا البحث هو التحكم في سرعة محرك المستمر باستخدام متحكم منطق غامض. أولاً، تم التحكم بالسرعة باستخدام المتحكم التناسبي- التكاملي - التفاضلي ومحاكاة النموذج باستخدام MATLAB/SIMULINK. في هذا البحث تم تصميم وتنفيذ وحدة المتحكم المنطق الغامض للتحكم في سرعة محرك التيار المستمر باستخدام أدوات المنطق الغموضي (FLT) الموجودة في MATLAB/SIMULINK. ونتائج المحاكاة تم عرضها.

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