الآية

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النهَّارَ ﴿آيَتَين ْ ِ ۖ فَمَحَو ْنا َ آيَةَ اللَّيْلِ وَجَعَلْنَا آيَةَ

ِ َةً لِّتَبْتَغُوا فَضْلا ً مِّن وَلِتَّبَعِّلكُمُوْا عَدَدَ السِّ نِينَ

َكل ُ َّ شي َ ْ ءٍ فَصَّلْنَاهُ تَفْصِيلا ً ﴾

سورة الاسراء ﴿١٢﴾

DEDICATIONS

To my father and Mother

To my family

To students and engineers

To everyone can benefit from this research

ACKNOWLEDGEMENT

Thanks all thanks primarily to my father who has had the greatest role in my arrival to this degree. And thanks to my mother and family for their support to me through all my life. Many thanks go to the university administration because what did provide to us of chance and tender to obtain this degree .My thanks; gratitude and appreciation to my supervisor Dr. Awadalla Taifour for his support, assistance and guidance throughout the research. And thanks to my husband how is patronizing and support me to end this research, for him from me sincere thanks and gratitude.

ABSTRACT

Speed control of DC motor provides easy controllability and high performance; the most flexible control is obtained by means of separately excited DC Motor. Literature was reviewed of related study to understand the separately excited DC Motor and fuzzy logic. Mathematical and computer models of a DC motor and fuzzy logic were developed. MATLAB was used for system simulation.

The motor without controller gives unacceptable steady state error and gives slow settling time for the output time response. With PID controller gets slower settling time when load increase, the best choice for this motor is the fuzzy controller which has given good response after adjustment of its parameters.

مستخلص

يتم التحكم في محرك التيار المستمر لتسهيل التحكم وانتاج اداء العالي ويتم الحصول على تحكم أكثر مرونة عن طريق محرك التيار المستمر منفصل الاثارة.تم مراجعة دراسات مشابهة لفهم محرك التيار المستمر منفصل الاثارة و فهم المنطق الغامض. تم ايجاد نموذج رياضي و حسابي لمحرك التيار المستمر. استخدام برنامج الماتلاب لنمذجة النظام.

المحرك بدون إستخدام متحكم اعطى خطأ حالة مستقرة غير مقبول و اعطى زمن استقرار بطئ للاستجابة الزمنية للخرج. وفي حالة المتحكم التناسبي التفاضلي التكاملي تم الحصول على زمن استقرار ابطئ عند زيادة الحمل, أفضل خيار لهذا المحرك هو المتحكم الغامض حيث أعطى إستجابة زمنية جيدة بعد أن تم ضبط معاملاته.

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LIST OF ABBREVIATIONS

AC	Alternating Current
DC	Direct Current
EMF	Electro Motive Force
FIS	Fuzzy Inference System
FL	Fuzzy Logic
FLC	Fuzzy Logic Controller
FLS	Fuzzy Logic System
GUI	Graphical User Interface
MATLAB	Matrix Laboratory
MMF	Magnetic Motive Force
PID	Proportional Integral Derivative

LIST OF SYMBOLS

T_L	Load torque
T_d	developed torque
I_f	field current
I_a	armature current
v_a	armature voltage
R_a	armature resistance
L_a	armature inductance
W	angular speed
J_m	rotor inertia
B_m	viscous friction coefficient
K_T	torque constant
K_b	back EMF constant
φ	Magnetic flux
K_p	proportional gain
T_i	integral time constant
T_D	derivative time constant
K_i	integral gain
K_d	derivative gain
K_u	ultimate gain
T_u	ultimate period
k	static gain
τ	time constant
θ	time delay
K_I	integral constant
T_s	sampling period
Ce	change in error