

الآية

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سورة الإخلاص

DEDICATION

We dedicate this thesis to our parents, our brothers, our sisters and friends, whose has been constant source of inspiration and support for us.

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ABSTRACT

The Proportional-Integral-Derivative (PID) control is a control strategy that has been successfully used over many years. Simplicity, a wide range of applicability and near-optimal performance are some of the reasons that have made PID control so popular in the academic researches and industry applications.

In this research a brief summary of PID theory is given, then some of the most used PID controller tuning methods are discussed, model of using PID to control speed of direct current motor studied with detailing because it is one of the most common actuator used in the control system.

Model has been simulated by using MATLAB/SIMULINK. Simulation results have been presented.

مستخلص

الحاكمة التناسبية-التفاضلية-التكاملية (PID) إستراتيجية استعملت بصورة ناجحة منذ سنوات عديدة. بساطة التشكيل وسعة التطبيق والأداء المثالي جعلت هذه الحاكمة (PID) ذات إنتشار واسع جداً في كثير من البحوث الأكاديمية والتطبيقات الصناعية. هذا البحث اعطى خلاصة قصيره عن هذه الحاكمة و مناقشه اكثر الطرق شيوعاً في ضبط هذه الحاكمة مع التطرق لاستخدامها في التحكم بسرعه محرك تيار مستمر لأنه واحد من اكثر المشغلات شيوعاً في انظمه التحكم. النموذج تمت محاكاته بإستخدام MATLAB/SIMULINK ونتائج المحاكاة تم عرضها.

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LIST OF SYMBOLS

V_f	Field voltage
ω_m	Angular velocity
Φ	Magnetic flux
I_f	Field current
G	Transfer function
K_P	Proportional gain
K_I	Integration gain
K_d	Derivative gain
V	Voltage across the coil of the armature
E_b	Back emf electrical motion force
I_a	Rotor's current
R_a	Armature resistant
L_a	Armature inductance
K_M, K_b	Velocity constant and back electromotive force constant
T_M	The electromagnetic torque
J	Moment of inertia of the rotor
Θ_m	Angular position
G_c	Transfer function of DC motor
T_s	Settling time
T_r	Rise time

LIST OF ABBREVIATIONS

DC	Direct Current
AC	Alternating Current
PID	Proportional-Integral-Derivative
PC	Proportional Controller
IC	Integral Controller
DC	Derivative Controller
MPC	Model Predictive Control
DCS	Distributed Control System
CHO	Chinese Hamster Ovaries
SIP	Sterilization-In-Place
RTD	Resistant Temperature Detectors
VPC	Valve Position Controllers
ADC	Analog to Digital Converter
DAC	Digital to Analog Converter