ABSTRAK

Nama : Muhammad Yusuf Avianto

Program Studi : Fisika

Judul : Kontrol Kecepatan Motor *DC* Menggunakan Mikrokontroler Dengan Metode Kombinasi *Proportional-Integral-Derivative* dan *Fuzzy Logic Controller*

Telah dilakukan percobaan kontrol kecepatan motor *dc* menggunakan mikrokontroler dengan metode kombinasi *proportional-integral-derivative* dan *fuzzy logic controller* di laboratorium mikroprosesor jurusan fisika Institut Sains dan Teknologi Nasional menggunakan alat arduino uno *board* , *breadboard*, kabel *jumper*, motor *dc* 5.9 volt, dioda 1 ampere, *resistor* 220 ohm, *transistor* 2N222, *sensor* kecepatan *optocoupler*, dan program arduino IDE. Hasil yang didapat dengan menggabungkan metode *PID* dengan metode *fuzzy logic controller* yaitu dengan deviasi terbesar 1,25% dan deviasi terkecil 0,625%. Sebagai pembanding, deviasi terbesar dari metode adaptif sebesar 1,875% dan deviasi terkecil 0,625%. Metode konvensional *PID* 1 menghasilkan deviasi terbesar 1,875% dan deviasi terkecil 0,625%. Sedangkan metode konvensional *PID* 2 menghasilkan deviasi terbesar 2,5% dan deviasi terkecil 0,625%. Perbandingan dari hasil tersebut menunjukkan bahwa metode kombinasi *PID* dan *fuzzy logic controller* dapat mengurangi tingkat deviasi terbesar dari metode *PID* konvensional dan metode *PID* adaptif.

Kata Kunci :

PID, *Fuzzy Logic Controler*, Metode

ABSTRACT

Name : Muhammad Yusuf Avianto

Study Program : Physics

Title : DC Motor Speed Control Using Microcontroller With Proportional-Integral-Derivative and Fuzzy Logic Controller Combination Method.

Had been done a dc motor speed control using microcontroller with proportional-integral-derivative and fuzzy logic controller combination method experiment in microprocessor laboratorium of physics department of National Institute of Science and Technology using devices arduino uno board, breadboard, jumper cable, 5.9 volt dc motor, 1 ampere diode, 220 ohm resistor, 2N222 transistor, optocoupler sensor, and arduino IDE. Achieved result from PID and fuzzy logic controller combination are 1,25% on biggest deviation and 0,625% on smallest deviation. As a comparation, adaptive method give results 1,875% on biggest deviation and 0,625% on smallest deviation. PID 1 conventional method give results 1,875% on biggest deviation and 0,625% on smallest deviation. And PID 1 conventional method give results 1,25% on biggest deviation and 0,625% on smallest deviation. Comparation of those results showing that PID and fuzzy logic controller combination method can reduce biggest deviation level of adaptive PID method and conventional PID method.

Keywords :

PID, Fuzzy Logic Controller, Method