Practical Implementation of GA-Based PID Controller for Brushless DC Motor

MOHAMED ABDELBAR SHAMSELDIN ALY ,M. Abdullah Eissa, Adel. A. EL-Samahy

Abstract

This paper presents a practical implementation of a Genetic Algorithm (GA) based PID controller for high performance Brushless DC (BLDC) motor. The purpose is to test the ability of the proposed GA based PID controller to force the rotor speed of BLDC motor to follow a preselected speed track. Three different cost functions are used by GAoptimization method to find the proper PID controller parameters. The objective of the first cost function is to minimize the square error while the objective of the second cost function is to minimize rise time, steady state error, settling time and maximum over shoot according to the priority of the designer. Moreover, the objective of third cost function compromise between minimizing either the maximum over shoot and steady-state error or the rise time and settling time. The simulation and experimental results show that the performance of genetic PID controller based on third cost function has the best performance amongthese techniques.

International Middle East Power System Conference 2015 2015, December

Future University In Egypt (http://www.fue.edu.eg)

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