World Academy of Science, Engineering and Technology
International Journal of Electrical and Information Engineering
Vol:8, No:09, 2014

Genetic Algorithms for Parameter Identification of DC Motor ARMAX Model and Optimal Control

Authors : A. Mansouri, F. Krim

Abstract : This paper presents two techniques for DC motor parameters identification. We propose a numerical method using the adaptive extensive recursive least squares (AERLS) algorithm for real time parameters estimation. This algorithm, based on minimization of quadratic criterion, is realized in simulation for parameters identification of DC motor autoregressive moving average with extra inputs (ARMAX). As advanced technique, we use genetic algorithms (GA) identification with biased estimation for high dynamic performance speed regulation. DC motors are extensively used in variable speed drives, for robot and solar panel trajectory control. GA effectiveness is derived through comparison of the two approaches.

Keywords : ARMAX model, DC motor, AERLS, GA, optimization, parameter identification, PID speed regulation
Conference Title : ICEMPE 2014 : International Conference on Electrical Machines and Power Electronics
Conference Location : Istanbul, Türkiye
Conference Dates : September 29-30, 2014