

Extensive Recursive Least Squares and Genetic Algorithms for Parameter Identification of DC Motor ARMAX Model

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Abstract– This paper describes two techniques for the parameters identification of a DC Motor. In the first one we propose a detailed numerical method using the most popular extensive recursive least squares (ERLS) algorithm to estimate these parameters in real time. We use this algorithm with its various extensions to identify the parameters of the autoregressive moving average with extra inputs (ARMAX) model associated to the DC Motor. This method is based on the minimization of a quadratic criterion. As advanced technique, this paper proposes genetic algorithms (GA) to identify model parameters with biased estimation for a high dynamic performance of the speed control. Separately excited DC motors are used extensively in variable speed drives and in robotic. GA effectiveness is derived through comparison of the two approaches.