IDENTIFICATION OF THE MATHEMATICAL MODEL OF THE CONTROL OBJECT BASED ON THE GENETIC ALGORITHM

Irina COJUHARI, Ion FIODOROV, Bartolomeu IZVOREANU, Dumitru MORARU, Inga LISNIC

Technical University of Moldova, Bd. Ştefan cel Mare, 168, MD-2004, Chisinău, Republic of Moldova

Corresponding author: **irina.cojuhari@ati.utm.md**

In industrial automation is widely used the PID control algorithm and there are many tuning methods of typical controllers as: the empirical methods based on the classical methods of finding the tuning parameters developed by Ziegler-Nichols, analytical methods, graph-analytical methods and methods based on the optimization techniques. A large class of these methods require to be known the mathematical model of the technological process, that involves to be used the identification procedure. Identification procedure suppose mathematical modelling of the technological process, based on the experimental data acquisition. There are two kind of identification methods: parametric and non-parametric methods.   There are a lot of parametric methods that permit to obtain the mathematical model of the technological process as: model adjustment method, iterative optimization, neural network etc.

In this study was proposed to use the genetic algorithm with the goal to obtain the mathematical model of the process. In the figure 1 is presented the obtained results, where: curve 1 - represents the experimental data, curve 2 - represents transient process obtained by using the genetic algorithm for the parameter estimation and curve 3 - presents results obtained in case of using the MATLAB for model identification.
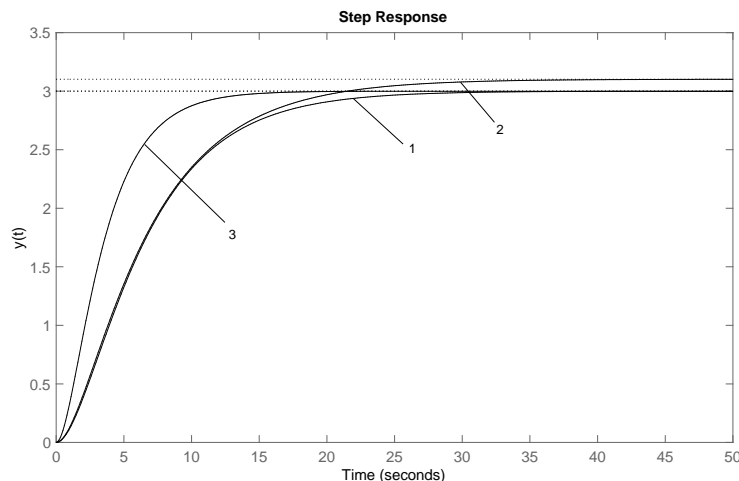

Fig.1. The results of identification.

Keywords: *identification, mathematical model, transfer function, genetic algorithm.*

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