ESTIMATION OF THE MATHEMATICAL MODEL OF THE DC ENGINE COUPLED WITH A REACTION WHEEL USING GA

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The Center for Space Technology of the Technical University of Moldova is designing a satellite that aims to scan the territory of the Republic of Moldova using a camera. This implies the need to control the attitude of the satellite in orbit using reaction wheels and magetoquers. In this paper, it was proposed to carry out the experimental identification of the mathematical model of the DC motor, coupled with a reaction wheel.

The experimental data acquired from the DC motor are shown in Figure 1, representing the variation of the DC motor speeds at the reference speed of 8270 rpm.
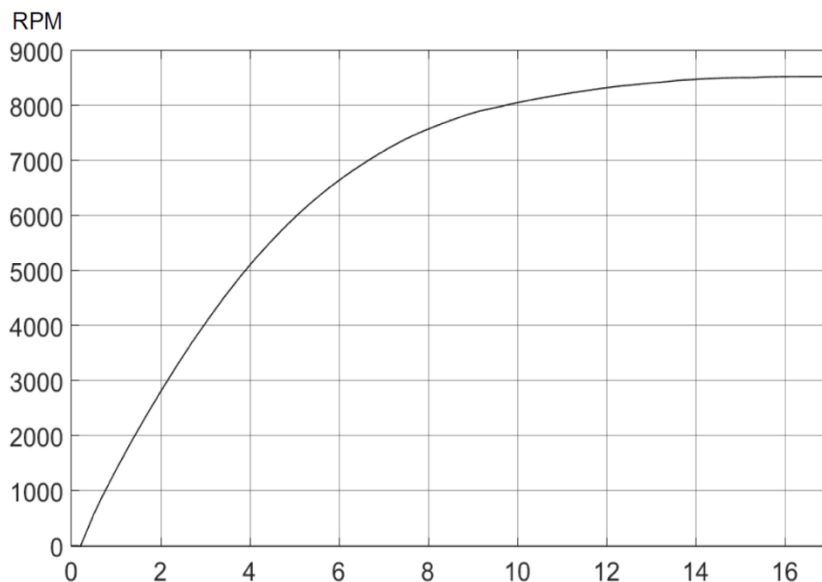

Figure 1: Experimental curve.

It was proposed to approximate the experimental curve with the mathematical model with inertia of order 2, identified by genetic algorithm.

To estimate the mathematical model of the control object it was proposed to use the genetic algorithm, the results obtained were compared with the Kupfmuller and Strejc methods, and the results obtained using the Process Models module from System Identification Toolbox from MATLAB.

Keywords: *model, identification, genetic algorithm, DC motor.*

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