optimization problems, but are not intended for solving problems of static optimization of parameters for the power unit as a whole.

NEURAL NETWORK CONTROL OF THE BRIDGE CRANE BRIDGE MOVEMENT MECHANISM SYSTEM

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In recent years, neural networks have been widely used as regulators of control systems with complex kinematic chains. Therefore, research on the application of neural networks for management tasks is relevant.

Synthesis of a neural network control system for a two-mass electromechanical system of a bridge crane carriage movement mechanism, which has high performance quality indicators.

The control system is built according to the principle of subordinate regulation and contains two circuits: the EMF regulation circuit and the current regulation circuit subordinate to it. The closed loop current and EMF are adjusted to the modular optimum.

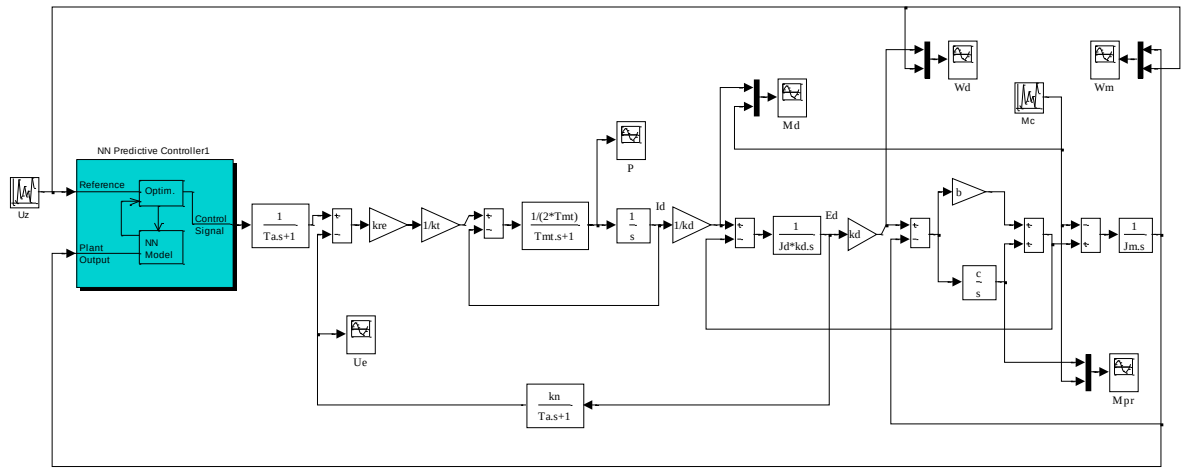

Fig. 1. Scheme of the two-mass system model with the NN Predictive Controller neuroregulator

A mathematical model of the control system was developed, taking into account the rocking of the load in the horizontal plane. The two-mass system was simulated on a computer using the MATLAB application program package. It was established that the transient processes of the state variables of a two-mass system have the character of weakly damped oscillations.

In order to provide the system with the desired indicators of the quality of functioning, the synthesis of the neuroregulator with the NN Predictive Controller forecast, implemented in the Neural Network Toolbox application program package of the MATLAB system [1], was performed. The scheme of the neural network system model is shown in Fig. 1. Modeling of the system was carried out. It was established that the developed neural network system has high indicators of the quality of functioning.

The scientific novelty of the work consists in the development of a new neural network control system for the two-mass electromechanical system of the bridge crane movement mechanism, which provides high-quality regulation.

Reference

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