

Modeling the hierarchical control system for a group of ground-based robotic tools

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The article considers an approach to the modeling the hierarchical control system for a group of ground-based robotic tools. The review of existing structures of systems for control of such tool group is given. The main drawbacks of control systems using only a centralized or decentralized approach in the interaction of ground-based robotic tool subgroups are indicated. The application of the hierarchical control system combined structure is proposed. The individual levels of such structure can be represented in the form of finite-automatic control networks. A mathematical formulation of the problem of modeling a similar system is given. The simulation model of the control system is implemented in the MATLAB, geo-referencing to the landscape and 3D visualization of the ground-based robotic tool movement is implemented with the Panorama geoinformation system. The simulation results are given on the example of the group of ten robotic tool operation. It is concluded that using the combined structure of a group control system for ground-based robotic tools is advisable.

Keywords: centralized control system, decentralized control system, hierarchical control system, ground robotic tools, finite-automatic control network, geoinformation system “Panorama”

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