

Modeling of dynamics of cooperating wheeled mobile robots

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Abstract: The work presents the dynamics of the system of two wheeled mobile robots cooperating in the transport of large-size cargo in the form of a beam. The purpose of modeling such a system was to obtain a mathematical model in an applicable form. The Lagrange equations of the second type were used to describe the dynamics, and then the projective method was used to eliminate Lagrange multipliers. Thanks to this approach, unknown dry friction forces at the contact points of robot wheels with the ground were eliminated from the description and the dynamics in controllable coordinates was obtained. In addition, the obtained model has structural properties that enable its use in the synthesis of a control system based on a mathematical model.

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