ROBOT VEHICLE TRAJECTORY CONTROL

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The trajectory control system of a robotic vehicle plays an important role in the route development process. One of the important points is the calculation of the kinematic model. Control synthesis is carried out on the basis of a kinematic model. The desired trajectory, due to which it is necessary to implement the movement, is given as a smooth implicit function in the fixed coordinate system [1].

Control synthesis is carried out using the differential-geometric method with the help of a nonlinear transformation of the original kinematic model to a task-oriented form that describes the longitudinal movement of the trajectory direction and orthogonal deviation. To convert the model, proportional controllers are synthesized with direct compensation of nonlinear components [2].

It is known that the position determination of a moving object on a plane can be obtained based on the path calculation, for which the principle of inertial navigation systems can be used [3]. Also this report presents the operation of the navigation system, which is responsible for orienting of the robotic vehicle in space.

The purpose of the report is to present nonlinear algorithms for controlling a robotic vehicle.

In motion trajectories, a straight line segment and a circle are considered, the combination of which can be used to implement most of the practical tasks of controlling mobile robots. Control system is additionally installed sensor elements that can be used for more accurate control, as the solution of the main problem. **The report** gives the results of measurements from automated program, realized on modern algorithms. The given data show that make it possible to control a robotic vehicle in a limited space with minimal time losses. The use of trajectory control system provides a significant expansion of technological and functional capabilities of the mobile robot. Thus, the developed system allows bettering to solve the movement problem, the optimal trajectory selection and other robotic vehicle actions. Therefore, the use of these systems may increase the demand for their use and implementation in various robotic vehicles.

References

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