عنوان مقاله:

Integral Sliding Mode Trajectory Tracking Control of Nonholonomic Mobile Robots Based on the Harmonic Potential Field Approach

محل انتشار:

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خلاصه مقاله:

In this article, the effectiveness of the harmonic potential field theory based on the panel method to generate the reference path and orientation for trajectory tracking control of the three wheel nonholonomic robot in the presence of static obstacle(s) is investigated. The hybrid control strategy based on a backstepping kinematic control and integral sliding mode dynamic control is employed. Also, in order to compare the performance of the proposed algorithm, a hybrid controller based on acceleration controller has been established. The employed control method insures the stability of the controlled system according to Lyapunov's stability law. The results of simulation program show the remarkable performance of the proposed method as the robust dynamic control of the mobile robot in tracking the reference path in the clutter environment by static obstacle(s) with outstanding disturbance suppression characteristic

کلمات کلیدی:

Nonholonomic mobile robot, obstacle avoidance, harmonic potential field, backstepping control, integral sliding mode control