Accepted Manuscript

Inverse dynamics and energy optimal trajectories for a wheeled mobile robot

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PII: S0020-7403(16)30521-5
DOI: 10.1016/j.ijmecsci.2017.10.044
Reference: MS 4011

To appear in: *International Journal of Mechanical Sciences*

Received date: 18 October 2016
Revised date: 17 August 2017
Accepted date: 29 October 2017

Please cite this article as: Haokun Kang, Caishan Liu, Yan-Bin Jia, Inverse dynamics and energy optimal trajectories for a wheeled mobile robot, *International Journal of Mechanical Sciences* (2017), doi: 10.1016/j.ijmecsci.2017.10.044

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Highlights

- A detailed analysis of the contact kinematics, together with a general way of formulating the local contact constraints.
- Analysis for the global property for a set of nonintegrable constraints using an alternative version of the Frobenius theorem.
- A concise dynamic model for the WMR convenient for determining the control input via a dynamics-based control method.
- Two means for tracking control: a servo constraint-based method and a differential flat-based method
- Clarifying the choice of the integral of the Lagrangian for the cost function in finding the energy optimal trajectory.
- A numerical algorithm based on the Ritz approximation to achieve energy optimal trajectory.

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