

Abstract

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Inverse Dynamic Solution for Holonomic Wheeled Mobile Robot with Modular Wheel Actuation

This paper proposes an inverse dynamic solution for the holonomic mobile robot (C3P) with modular wheel actuation. The C3P has three caster wheels with angular velocities actuation, which generates singularities in the inverse kinematic solution. The inverse dynamic solution is derived using Euler-Lagrange method with respect to the actuated elements. The inverse kinematic actuation solutions of the steering and contact angular velocities are employed with in the solution, which delivers a non singular dynamic solution. The simulation results illustrate clearly the increased efficiency; the robustness of the inverse dynamic solution over the inverse kinematic one. The practical results show the feasibility of the proposed solution.