عنوان مقاله:

Mathematical Modeling of a Compounded Serial-Parallel Mobile Robot

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خلاصه مقاله:

In this study, kinematics and dynamics of a compounded serial-parallel wheeled mobile robot is elaborated. The newly proposed combination is made of a differentially-driven wheeled platform, a planar parallel manipulator, which is called here as Star-Triangle (ST) mechanism, and a serial Puma-type manipulator arm. The suggested structure adopts the advantages of both serial and parallel robots. In order to investigate the comprehensive kinematics model of the robot; first it is divided into three modules, that is to say mobile platform, parallel ST mechanism and serial robot. Next, a closed-form dynamics model is offered for the whole hybrid system based on a combined Newton-Euler and Lagrange formalism. In addition, the suggested valuable method presents the mutual dynamic interaction wrenches between the integrated platform and the serial manipulator which can be exploited for the tip-over stability analysis of the mobile robotic system.

کلمات کلیدی:

Wheeled Mobile Robot, Dynamics Modeling, Kinematics

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/79720