

عنوان مقاله:

Kinematics Modeling of a Highly Stable Space Rover

محل انتشار:

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نویسندگان:

S. Ali. A. Moosavian - *Associated Professor. Dept. of Mech. Eng. -K. N. Toosi Univ. of Technology - Tehran*

Ali Rezvanifar - *Graduate Student, Dept. of Mech. Eng. -K. N. Toosi Univ. of Technology - Tehran (corresponding author)*

خلاصه مقاله:

In this paper, the general kinematics model of a proposed Articulated Terrain Rover (ATR) is developed. This rover has been designed for traversing on rough terrain and posses a highly stable structure on the terrain with the adapting articulated chassis on the terrain. Furthermore, this rover has the capability of changing the position of the total system center of mass with respect to the main moving body. The number of required actuators can be decreased compared to the previous systems, as well. Besides, considering motion on an uneven terrain with general 6DOF motion, the developed model considers the longitudinal and lateral slope of a 3D terrain in the each wheel contacts. After introducing the proposed mechanical structure, differential kinematics is derived for each wheel that is in contact with the terrain. The resulting equations of wheel motions are then combined altogether to form the equations for the rover motion. Then, the kinematic constraints are found by using geometrical and physical concepts. Moreover, the steering angles of front wheels are determined by using car-like mobile robot steering approach for 3-D motion.

کلمات کلیدی:

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