

机械科学

差速转向复合式探测机器人运动学分析

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摘要:

为便于探测机器人的导航和跟踪控制,提出了差速转向的复合式移动机器人运动学模型的构建及求解方法。通过对差速转向复合式移动系统结构及运动特性进行分析,推导了探测机器人车体速度与后轮及承重轮速度之间的关系矩阵,提出采用Householder变换求解车体运动的方法,为探测机器人越障过程中位置和方位的估计提供了较准确的求解模型。最后对差速转向复合式机器人的行进过程进行仿真试验,验证了运动学模型的正确性及机器人的运动特性。

关键词:

差速转向;探测机器人;移动系统;运动学;Householder变换

Kinematics Analysis of Differential Steering Exploration Robot with Compound Walking Mechanism

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Abstract:

In order to improve the accuracy of navigation, a kind of new method was presented to establish and solve the kinematics model of wheel-tracked exploration robot. By analyzing the structure of the moving system, a kinematics model of exploration robot was set up and kinematics equations were deduced. Then the kinematics relationships between the bodywork and the wheels were established, and the Householder transformation was used to estimate the least-squares solution of the kinematics equations, which provides an efficient method to obtain more accurate solutions. At last, the effect of the correctness of kinematic model and solution method was testified by computer simulation.

Keywords: [differential steering; exploration robot; moving system; kinematics; Householder transformation](#)zz')" href="#"> [differential steering; exploration robot; moving system; kinematics; Householder transformation](#)

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