

论文与报告

双机械手对称协调力/位混合控制--模型、控制算法与实现

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摘要

该文研究双手协调运动和力控制方法. 基于一组面向对象的广义运动和力向量的定义, 考虑对象动力学, 建立了面向对象的双手对称协调运动方程, 该运动方程显式地表示了对象的运动、内力及环境接触力与双手关节力矩间的关系. 据此设计出广义工作空间一级的双手对称协调力/位混合控制算法, 并解决了算法的分解与并行实现问题. 在两台PUMA562机械手上进行的实验表明, 本文研究的方法, 可以在双手协调运动过程中实现对被操作对象的运动、内力和环境接触力的混合控制.

关键词 [双手对称协调](#) [内力/外力](#) [内运动/外运动](#) [力/位混合控制](#)

分类号

Hybrid Position/Force Control for Dual-Arm Symmetric Coordination-Model, Algorithm and Realization

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Abstract

In this paper, we deal with motion and force control methods for coordination of two robot manipulators, which grasp a rigid object tightly in the presence of environment constraints. Based on the definition of a group of object-oriented generalized workspace motion and force vectors, the object-oriented dynamic equations for dual-arm coordination which take object dynamics into account are derived. The relationships of object motion, internal force, and contact force are explicitly presented in these equations. Next, a hybrid control algorithm for dual-arm symmetric coordination is designed. Decomposition and parallel realizations of the algorithm are also considered. Finally, some experiments and their results are given. The experimental results show that this method is useful to motion and force control for dual-arm coordination.

Key words [Dual-arm symmetric coordination](#) [internal motion/external motion](#) [internal force/external force](#) [hybrid position/force control](#)

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