



论文摘要

中南大学学报(自然科学版)

ZHONGNAN DAXUE XUEBAO(ZIRAN KEXUE BAN)

Vol.32 No.4 Aug.2001

[PDF全文下载] [全文在线阅读]

文章编号: 1005-9792(2001)04-0428-05

基于DSP的GR- II 机器人控制器

阳小燕, 周国荣, 陈 新

(中南大学信息科学与工程学院, 湖南长沙 410083)

摘 要: 在分析和研究GR- II 教学机器人原控制器的基础上, 设计了1种能在机器人上研究、实现不同轨迹规划方法和控制算法的基于DSP的新型机器人控制器. 该控制器以通用PC作为上位计算机, 用6个DSP对机器人6个关节运动进行插补计算和伺服控制, 采用高速CAN总线进行上位机与下位机之间的通讯, 实现上位机和下位机的双速率运行, 以适应复杂控制算法对计算时间和机器人运行性能与精度对高伺服频率的要求. 同时, 通过软件设计在上位机进行运动学、动力学计算, 并据此修正下位机控制算法的PID参数, 实现动力学近似补偿.

关键字: 机器人; 控制器; DSP

The research of GR- II robotic controller based on DSP

YANG Xiao-yan,ZHOUGuo-rong,CHEN Xin

(College of Information Science and Engineering, Central South University, Changsha 410083, China)

Abstract: On ground of analysis and research of the original controller of the GR- II pedagogic robot, the authors designed a new robotic controller based on DSP on which different track plans and control algorithms can be studied and realized. This controller takes universal PC as the supervisory-controlled computer, and six DSPs as controller's cores to interpolation-calculate and servo-control the six joints of the robot. It adopts high-speed CAN Bus to communicate and realize the two-stage controllers running at different speeds, and can fulfil the demands of the calculating-speed of complex control algorithms and the high servo-frequency of capacity and accuracy of robot coursing. At the same time, the inverse kinematics and dynamics analysis can be made on the supervisory-controlled computer by software design. It can amend the parameters PID of the control algorithm on the controller according to the dynamics to realize the dynamics compensation.

Key words: robot; controller; DSP

版权所有：《中南大学学报(自然科学版、英文版)》编辑部

地 址：湖南省长沙市中南大学 邮编： 410083

电 话： 0731-88879765 传真： 0731-88877727

电子邮箱： zngdxb@mail.csu.edu.cn 湘ICP备09001153号