FM02

Poster Session

FM02-1

Singularity and manipulability analysis of a wheeled mobile manipulator

Sungbok Kim, Jaeyoung Lee(Hankuk Univ. of Foreign Studies)

● Proper definition of manipulability ellipsoid
● Volume and directional measures of manipulability
● Kinematic modeling as a serial connection
● Configuration dependent singularity
● Effect of nonholonomy on manipulability
● Effect of end-effector positioning on manipulability
● Effect of serial cooperation on manipulability

FM02-2

A Study on Indoor Mobile Robot Navigation Used Space and Time Sensor Fusion

Tae-Seok JIN, Jae-Pyung KO, Jang-Myung LEE(Pusan Nat'l Univ., KOREA)

This paper proposes a sensor-fusion technique where the data sets for the previous moments are properly transformed and fused into the current data sets to enable accurate measurement, such as, distance to an obstacle and location of the service robot itself. In the conventional fusion schemes, the measurement is dependent on the current data sets. As the results, more of sensors are required to measure a certain physical parameter or to improve the accuracy of the measurement. However, in this approach, instead of adding more sensors to the system, the temporal sequence of the data sets are stored and utilized for the measurement improvement. Theoretical basis is illustrated by examples and...

FM02-3

System Design and Control of an Autonomous Stair Climbing Robot

Dong Hwan Kim, Young-Ho Hong(Seoul Nat'l Univ., KOREA), Sangsu Kim(APL Co. Ltd, KOREA), Geun Ho Jwa(Woosim System Inc., KOREA)

A quadruped stair robot introduced here plays a role in monitoring and moving some place where an operator can not reach or when he may not keep watching. It has several features that travels and poses variable position by four caterpillars and quadruped typed arms, transmits an image and command data via RF wireless and network communication. The robot can balance itself when it moves up and down on a slope by using the quadruped mechanism. The robot vision scans ahead before it moves, and the captured image is transferred to a main computer via a RF image module. The main computer analyzes the obstacle, and when it is found the obstacle, the robot avoids from the obstacle and keep moving f...

FM02-4

Dynamic Output Feedback Regulation of Robots with Flexible Joints

Young I. Son(Dong-A Univ., KOREA), Hyungbo Shim(Hanyang Univ., KOREA), Nam H. Jo(Soongsil Univ., KOREA), Jin H. Seo(Seoul National Univ., KOREA)

● Contents 1 : PD control of an elastic joint robot
● Contents 2 : Dynamic output feedback law without velocity measurements
● Contents 3 : Robust analysis for parameter uncertainties of the robot system
● Contents 4 : Simulation studies with a three joint robot system
● Contents 5 : Performance comparison with an another control law

---

FM02-5

Configuration Control of a Redundant Manipulator Optimizing Stiffness and Joint Torque

Jaehyun Jin, Sungho Ahn, Jaehoo Jung, Jisup Yoon(KAERI, KOREA)

In this paper, we focus on a configuration control method of a redundant manipulator. The configuration of a redundant manipulator has been determined by geometry constraints and additional conditions, such as obstacle avoidance and dexterity optimization. This paper also utilizes optimization, and the additional condition (or performance index) to be optimized is stiffness of the end-effector and joints' torque. Stiffness and torque may be a natural attribute to be controlled during working and those vary as manipulator configuration does. So the optimal configuration from the viewpoint of stiffness and joint torque is studied. If the servo control mechanism of the joints is assumed to be a...

FM02-6

OHT System for 300mm wafer cassette transfer

Sunghyun Lee, Jinki Kim, Hakkyung Sung(Samsung Electronics Co. Ltd., KOREA)

● Contents 1 Introduction
● Contents 2 300mm OHT System
● Contents 3 Function of OHT System
● Contents 4 Control Method
● Contents 5 Conclusion