

FM02

Poster Session

13:30-15:30

Chair1 : Tae-Jung Lho (Tongmyoung Univ., Korea)

Room : Base 2nd Floor-Zillertal

Chair2 :

FM02-7

An Obstacle Avoidance Trajectory Planning for a Quad-ruped Walking Robot Using Vision and PSD sensor

Jung-Shik Kong, Bo-Hee Lee(Semyung Univ., KOREA), Jin-Geol Kim(Inha Univ., KOREA)

- This paper deals with obstacle avoidance of a quadruped robot with a vision system and a PSD sensor.
- The vision system needs for obstacle recognition toward robot.
- The PSD sensor is also important element for obstacle recognition.
- We propose algorithm that recognizes obstacles with one vision and PSD sensor.
- We also propose obstacle avoidance algorithm with map from obstacle recognition algorithm.
- Using these algorithm, Quadruped robot can generate gait trajectory.
- Therefore, robot can avoid obstacles, and can move to target point.

FM02-9

The Position Control of Stroke Sensing Cylinder for Automatic Excavation

Ku Young Son, Sung Su Kim, Soon Yong Yang, Byung Ryong Lee, Kyung Kwan Ahn(Ulsan Univ., KOREA)

Abstract: The Field Robot means the machinery applied for outdoor tasks in construction, agriculture, and undersea etc. In this study, to robotize the hydraulic excavator that is mostly used in construction working, we developed an interfacing hardware units of stroke sensing cylinder using magnetic sensor and estimated its performance. It is illustrated by experiment that the proposed control system by stroke sensing cylinder gives good performances in the position control.

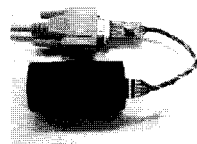
Keywords: Field Robot, Excavator, Stroke Sensing Cylinder, Hall Sensor

FM02-11

Digital Polymer Motor

SangWon Lee, Jongwon Kwak, Kwangmok Jung, Sunghwi Cho, Hunmo Kim, Jaewook Jeon, Jaedo Nam, Hyoukryeol Choi(Sungkyunkwan Univ., KOREA)

Digital Polymer Motor (DPM) based on dielectric elastomer is presented. It includes all the supplementary parts for actuation such as micro-controller, DC-DC converter etc. DPM can be operated by itself with the program embedded and controlled via serial interface with PC.



The actuator accomplishes bidirectional actuation and compliance controllability, which are important characteristics for a biomimetic artificial muscle actuator. DPM accomplish these requirements without any mechanical substitute or complicated algorithms. Its basic concepts and working principles are addressed with modeling and simulation and the compliance controllability are verified by conducting several experiments.

- Polymer, Dielectric, Biomimetic

FM02-8

Stability Analysis of a Biped Walking Robot with Foot Rotation Indicator

Kyung-Kon Noh, Bo-Hee Lee(Semyung Univ., KOREA), Jin-Geol Kim(Inha Univ., KOREA)

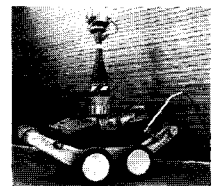
- Statically stable walk with COG(center of gravity)
- Dynamically stable walk with ZMP(zero moment point)
- Dynamically adaptational stable walk with FRI(foot rotation indicator)
- Simplified inverted pendulum model approach
- Analysis posture of biped's foot as passive joint
- Stability compensation method of FRI against falling down
- Simulation of ZMP and FRI to real biped robot IWR-III

FM02-10

The Tele-operated Mobile Robot Kaerot/m2 for Nuclear Power Plants

Chang Hoi Kim, Yong Chil Seo, Jai Wan Cho, Seungho Kim, Young Soo Choi(KAERI, KOREA)

The development of a teleoperated mobile robot, Kaerot/m2, has been described. Kaerot/m2 consists of three sub-systems - a 4 wheeled mechanism with the dual reconfigurable crawler arms, a thermal image monitoring system, and an extendable long reach mast. The mechanical design, control system of Kaerot/m2 in terms of remote inspection operation at a high radiation level of the Calandria face environment has been shown.



Kaerot/m2 is capable of detecting the degraded locations of the Calandria face in a remote manner.

FM02-12

Development of an autonomous biped walking robot

choi, hyeung-sik choi, jeong-min Oh, young-sik Kim, chang-yul Baek(Korea maritime univ., KOREA)

Contents 1We developed a new type of lower part of the human-sized BWR (biped walking robot) driven by a new actuator based on the ball screw which has high strength and high gear ratio. Each leg of the robot is composed of three pitch joints and one roll joint. In all, a 8 degree-of-freedom robot was developed. A new type of actuator for the robot is proposed, which is composed of four bar link mechanism driven by the ball screw. The BWR was designed to walk autonomously by adapting small DC motors for the robot actuators and has an embedded controller system including host computer, batteries and motor drivers. In the performance test, we had basic stable walking data so far, but we f...