

SA05

Service Robot

10:10-12:10

Room : 1st Floor-Strauss

Chair1 : Byung-Ju Yi (Hanyang Univ., Korea)

Chair2 :

10:10 – 10:30

SA05-1

Development of a Guide Service Mobile Robot

Tong-Jin Park, Chang-Soo Han, Jae-Ho Jang(Hanyang Univ., KOREA)

- Introduction: Service robot
- Design of the Guide Service Mobile Robot
- Path tracking algorithm
- Path recognition algorithm
- Localization
- Guide lever
- Conclusions: A mobile robot was developed as a service robot



10:30 – 10:50

SA05-2

Design and Control of a Passive Compliant Joint for Human-friendly Service Robots

Seong-Sik Yoon, Sungchul Kang, Seung-Jong Kim, Munsang Kim(KIST, KOREA), Heung-Soon Yim, Young-Hwan Kim(Hyundai Heavy Industries Co. Ltd., KOREA)

In this paper a passive compliant joint (PCJ) for human-friendly service robots is presented. The PCJ is composed of a magneto-rheological damper and a spring for elasticity. In the magneto-rheological damper, a braking force proportional to the electric current is generated. It works as a viscous damper by controlling the electric current according to the angular velocity of spring displacement. The compliance property and position control of the PCJ are verified through experiments and simulations to a single DOF simple arm with the PCJ.

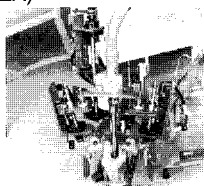
10:50 – 11:10

SA05-3

Experimental Evaluation of a Surgical Robot System (ARTHROBOT) for Hip Surgery using Sawbones and Pig Femurs

Seong-Young Ko, Jonathan Kim, Jong-Ha Chung, Dong-Soo Kwon, Jung-Ju Lee, Yong-San Yoon(KAIST, KOREA), Chung-Hee Won(Chunbuk Nat'l Univ., KOREA)

- A bone-mountable surgical robot system for hip surgery
- A simple gauge-based registration method
- A proposed surgical procedure
- Evaluation method for position/orientation accuracy
- Evaluation method for surface conformity
- The performance evaluation of ARTHROBOT
- Summary



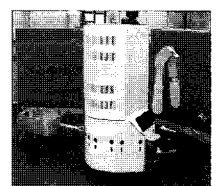
11:10 – 11:30

SA05-4

Control Architecture Design and Integration of the Autonomous Service Robot PSR

Gunhee Kim, Woojin Chung, Munsang Kim, Chongwon Lee(KIST, KOREA)

- Introduction : Control architecture of PSR
- Layered functionality diagrams
- Class diagrams
- Petri-net based configuration diagram
- Experiments
- Conclusions



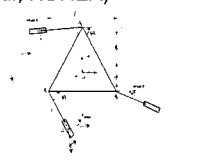
11:30 – 11:50

SA05-5

The Dynamic modeling and Analysis for Redundantly Actuated Omni-directional Mobile Robots

Byung-Ju Yi, Jae Heon Chung(Hanyang Univ., KOREA), Tae Bum Park(LG Industrial Systems Co. Ltd., KOREA), Whee Kuk Kim(Korea Univ., KOREA), Yong Ho Chung, Ki hyun Kwon, Kye-Young Lim(LG Industrial Systems Co. Ltd., KOREA)

- Lack of exact dynamic modeling of omni-directional mobile robots
- The exact dynamic model of the mobile robots including the wheel dynamics
- The joint-space and operational-space dynamic model of the mobile are derived as analytical forms
- Comparison between the discrepancy of the incomplete dynamic and the exact dynamic
- Useful aspect of redundant actuation



11:50 – 12:10

SA05-6

An Interactive Robotic Cane for Blind Travelers

Inbo Shim, Joongsun Yoon(Pusan Nat'l Univ., KOREA)

- Introduction
- A Robotic Cane "RoJi"
- Shared Navigation Control
- Autonomous Control Mode
- User Control Mode
- Navigation
- Summary

