FP05

Robot System III

13:30-15:30 **Chair1 : Md. Mozasser Rahman (Mie Univ., Japan)**
Room : 1st Floor-Strauss **Chair2 :**

13:30 – 13:50 FP05-1

Position and Force Control Based on Fuzzy Switching Algorithm

Jaehyun Jin, Sungho Ahn, Byungsuk Park, Jisup Yoon(KAERI, KOREA)

In this paper, a control strategy of position and force is proposed based on a switching algorithm. The main focus is the control of position and force in the same direction. The switching algorithm based on a fuzzy algorithm determines the weighting value of force control. First, the force control is dominant. If the position gets closer to the desire position, the weighting value of force control is closer to zero. The proposed algorithm is shown to be satisfactory to position and force control and the weighting factor is quite successful by simulation examples.

13:50 – 14:10 FP05-2

Stable Biped Walking by Trunk and Waist Motion

Hun-ok, H Lim(Kanagawa Institute of Tech., JAPAN), Atsuo Takanishi(Waseda Univ., JAPAN)

If a biped humanoid robot walks stably on even and uneven planes like a human being, it should have a control system capable of compensating for moments generated by motions of its lower-limbs, upper-limbs and head. In this paper, a compensatory motion control method is described for the stability of biped humanoid robots. This control method calculates the combined motion of the trunk and the waist that cancels the generated moments by using an iteration algorithm. During the biped walking, the combined motion is employed only for stability while the motion of the lower-limbs is used only for locomotion. This method is useful for not only a steady walking but also a transient walking. The e...

14:10 – 14:30 FP05-3

Impedance characteristic of human arm for cooperative robot

Md. Mozasser Rahman, Ryojun Ikeura, Kazuki Mizutani(Mie Univ., JAPAN)

In this study, we tried to investigate the impedance characteristic of human arm in a cooperative task. Human arm was moved in a desired trajectory. The motion was actuated by a 1 degree-of-freedom robot system. As the muscle is mechanically analogous to a spring-damper system, a second-order equation was considered as the model for arm dynamics. In the model, inertia, stiffness and damping factor were considered. The impedance parameter was estimated from the position and torque data obtained from the experiment and based on the "Estimation of Parametric Model". It was found that the inertia is almost constant over the operational time. The damping factor and stiffness were high...

14:30 – 14:50 FP05-4

Dynamic analysis and control for an UAV of DC motor type

YunSoo Park, HoGil Lee, ShinWook Ryu, JinYoung Kim, DaeHui Won(KITECH, KOREA), JongHyun Park(Hanyang Univ., KOREA)

- Flying Robot is a kind of UAV as an autonomous hovering platform.
- Control system is high complex, and non-linear Multiple-Input, Multiple-Output (MIMO) system.
- Eexperiment-device capable of measuring roll, yaw and pitch angle with PID controller by PC.
- This paper proves results of simulation through velocity control in condition.

14:50 – 15:10 FP05-5

Workspace Mapping for a Manipulator Operated by Universal Master

Min-Soo Lee, Jong Kwang Lee, E-Seok Kang(Chungnam Nat'l Univ., KOREA), Byung Suk Park, Ji Sup Yoon, Tai Gil Song(KAERI, KOREA)

The Master-Slave manipulator is generally used as a remote handling device in the hot cell, in which the high level radioactive materials such as spent fuels are handled. This study describes a workspace mapping algorithm for a kinematically dissimilar master-slave system. The algorithm provides the operator to guide the slave's end effector into unreachable regions which can appear due to the mismatch of workspace between the master and slave manipulator. A spaceball was used for the universal master device, and it can detect the slight fingertip force applied on the ball and also resolve the applied force. The spaceball device was also used to move 3D images instantaneously and simultaneou...