I-FP05 Sensors and Measurements 2

13:00-15:00 **Chair : Hikaru Inooka (Tohoku Univ.)**
Room : C204 **Co-Chair : Kim Hisik (Univ. of Seoul)**

13:00 – 13:20 **I-FP05-1**

Development of Automatic Filet Welding Torch System with High Speed Rotating Arc Sensor

W.K.Lee , G.Y.Lee ,J.H.Kim, S.B.Kim
(Pukyong Univ.)

Arc sensor gives important groove information during welding. Automatic seam tracking control system with arc sensor has significant characteristics such that bead formation is given as decentralization of penetration and formation of concave bead profile and that a turning point of transverse weaving with constant arc length control is decided whether or not torch height reaches to a specified setting level. Furthermore, the rotating action of the arc prevents hanging of weld bead and forms flat bead surface under high speed welding condition. The variation of groove and deposition area can be detected from the trace of weaving. The area and width of weaving trace has close correlation with the area of groove and deposition. In this paper, main object of this system is to realize an adaptive microprocessor based controller ...

13:20 – 13:40 **I-FP05-2**

Study of Human Perceptual Characteristics of Body Inclination Using a Tilt Bed

T. Hayashi, F. Wang, H. Inooka
(Tohoku Univ.)

This paper investigates human discomfort response to the foot-to-head acceleration. During ambulance transport, a patient suffers from the foot-to-head acceleration, which might deteriorate his illness. To investigate the relationship between the ride discomfort and the foot-to-head acceleration, experiments were performed using a van type automobile similar to an ambulance. The experimental results show that head-ward acceleration is more uncomfortable than the foot-ward acceleration. For further investigation of the difference of ride discomfort caused by the direction of acceleration, two experiments were performed using a tilt bed. In these experiments, foot-to-head acceleration is applied to the subjects by tilting the bed. Using a tilt bed, we investigated two things; relationship between discomfort and inclination of the bed ...

13:40 – 14:00 **I-FP05-3**

Development of a Sensor System to Measure Real Time Vibro Displacement of Civil Structure

Sungjun Bum and Hiesik Kim
(Univ. of Seoul)

A sensor system was developed to measure displacement of civil structure at a long distance. A He-Ne Laser tube and photodiodes ware used for non-contact measurement. This system allows real time vibration displacement measurement of bridges. The measured displacement data is displayed on computer monitor graphically and also in digit. The accuracy of the displacement measurement shows 2mm in vertical vibration. It shows remote inspection of the vibration of long bridges and buildings.

14:00 – 14:20 **I-FP05-4**

Reckoning of the Agricultural Vehicle in the Field Using Acoustic Ranging

T. Kawamura, M. Tokuda , T. Yoshioka
(Kobe Univ.)

An acoustic ranging system was applied for reckoning the location of an agricultural vehicle in the field. The system has a number of fixed stations and a mobile station such as an agricultural vehicle. The mobile station comprises a radio frequency modulator-demodulator (RF MODEM), a buzzer, and a personal computer. The fixed station comprises an RF MODEM, a microphone, an amplifier for the microphone, and a personal computer with a soundboard. The mobile station transmits a 7-bit ASCII code and activates the buzzer simultaneously. The propagation delay time at the fixed station is caused by the difference...

14:20 – 14:40 **I-FP05-5**

Unrestricted Measurement Method of Three-dimensional Walking Distance Utilizing Body Acceleration and Terrestrial Magnetism

Koichi Sagawa, Mitsutoshi Susumago, Hikaru Inooka
(Tohoku Univ.)

Unrestricted measurement method of three-dimensional walking distance utilizing body acceleration and terrestrial magnetism is discussed. The three-dimensional walking distance is derived by the integration of the three dimensional acceleration of foot during swing phase. Since the sensor system attached on the foot rotates during swing phase, the acceleration data measured on the foot include acceleration of gravity which causes inaccurate calculation of the velocity and the distance. Three gyros are used to compensate the rotation of the sensor system. Moreover, one geomagnetic sensor is employed to derive the heading direction of the subject. Healthy volunteers performed ...