

# FA04

## Biomedical

09:00-11:00

Chair1 : Kee Ho Yu( Chonbuk National Univ., Korea )

Room : 1st Floor-Wilder Kaiser

Chair2 :

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09:00 – 09:20

FA04-1

### Control of Platelet Rolling and Adhesion

Samuel E. Moskowicz(The Hebrew Univ., ISRAEL)

Platelets arrest bleeding and repair damaged blood vessels. The purpose of this paper is to formulate a mathematical model for the control of platelet adhesion within the vasculature consistent with experimental findings, particularly those of Frenette, Ruggeri, Savage, Yuan, Lawrence and Springer. In addition to providing some, albeit rudimentary, insight into the behavior of platelets, a numerical simulation of this theoretical model may be useful in a systematic study of pathological cases. Glycoprotein receptor complex (GPIb/V/IX), found on the platelet surface membrane, binds to the adhesive protein and ligand von Willebrand factor (vWf), located within the sub-endothelium. The binding ...

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09:20 – 09:40

FA04-2

### An experimental study on the human upright standing posture exposed to longitudinal vibration

Young-Kyun Shin, Arif Muhammad, Inooka Hikaru(Tohoku Univ., JAPAN)

Human upright standing posture in the sagittal plane is studied, when it exposed in the antero-posterior vibration. A two link inverted pendulum model is considered and described its functional behavior in terms of ankle and hip joint according to the dominant joints that provides the largest contribution to the corresponding human reactionary motion. The data is analyzed, both in the time domain and the frequency domain. Subjects behave as a non-rigid pendulum with a mass and a spring throughout the whole period of the platform motion. When vision was allowed, each segment of body shows more stabilized.

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09:40 – 10:00

FA04-3

### Non-restricted Measurement and Diagnosis of ECG signals

Gu Young Jeong, Kee Ho Yu(Chonbuk Nat'l Univ., KOREA)

In this paper, the algorithm for detecting the transient change of ST-segment and the device for measuring ECG from patient without restriction of activity are introduced. ST-segment elevation and depression is considered as the main characteristic in diagnosis of myocardial ischemia, but the change of pattern is also important. To consider all of the former and the latter, we used polynomial approximation for diagnosis of ECG. The feature points(R, S and T) are detected through the signal processing processes including wavelet transform, and then R-S and S-T are approximated to polynomial. This method allows comparison of two signals that have different sampling time or different numbers of...

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10:00 – 10:20

FA04-4

### Development of compact environment control system using eye-ball movement

Yasuhiro Nakashima, Mikohiro Matsuo, Inoue Kei(Nagasaki Univ., JAPAN), Takaki Yoshimura(Labo-tech Co.Ltd), Takakazu Ishimatsu(Nagasaki Univ., JAPAN)

Communicating devices for the seriously disabled using eye-ball movement or some body movement are proposed. The first one is a device to use image processing, whose input signal is eyeball movement, A feature of this device is that the device can be readily realized using a note-book computer with USB (Universal Serial Bus) interface bus. This device is incorporated with a word processing software called Hearty Ladder. The second one is an emergency call switch which is used by a patient who can move his finger slightly. The patients can switch on the emergency switch only by touching a switch with his finger. The essence of this sensor is a touch sensor. The sensor can be realized using onl...

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10:20 – 10:40

FA04-5

### Device for Assisting Grasping Function

Shunji Moromugi, Keisuke Izumi, Atsushi Yoshimochi, Takakazu Ishimatsu(Nagasaki Univ., JAPAN), Takayuki Tanaka(The Univ. of Electro Communications, JAPAN), Maria Q. Feng(Univ. of California, USA)

A mechanical device was developed for assisting the grasping function of a person whose fingers suffered cervical injury and thus are unable to grasp. This device is composed of a mechanical glove put on the user's hand and a muscle sensor to measure the activity of his or her muscle. The mechanical glove consists of a finger frame, a base and an air cylinder mounted on the base. With the kinematics carefully designed, the finger frame can achieve the grasping motion under the actuation of the air cylinder. For controlling this motion, an innovative sensor was developed to detect the user's motion intention. The sensor measures the change of the muscle stiffness...

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10:20 – 11:00

FA04-6

### Motored Wheel Chair applicable to a variety of disabled

Toru Jozaki, Motohiro Tanaka, Lawn Murry J, Takakazu Ishimatsu(Nagasaki Univ., JAPAN)

This paper describes a motored wheelchair that is suitable for disabled persons. A distinguish feature of our wheelchair is that a closed link mechanism is introduced. This link module changes conventional motored wheelchairs to computer controlled ones. It means that using intelligent functions of the computer, conventional motored wheelchairs can be navigated like an intelligent robot. Three examples of intelligent navigation functions are demonstrated. The first one is a motored wheelchair controlled by the head movement of the operator. The second one is a motored wheelchair with the image processing. Last one is a motored wheelchair with the remote sensing function.