I-FA03 Control Virtual Manufacturing

09:00-11:00 **Chair : Stefanov Dimitor H. (KAIST)**
Room : C202 **Co-Chair : Sung Hak-Kyung (Samsung Co.)**

09:00 – 09:20 **I-FA03-1**

Virtual Factory for Electronics Assembly Industry

Reginald Jegathese, Meehae Song, Jochen Quick, Haibin Wang, Yongmin Zhong, and Wolfgang Muller-Wittig
(CAMTech, Nanyang Technological Univ.)

Funded by the Singapore National Science and Technology Board (NSTB), CAMTech is collaborating with a Singaporean research institute and two industry partners with the objective to improve electronics assembly processes. The goal of this project is to visualise the behaviour of an electronics assembly industry by simulating, visualising the discrete events of the entire manufacturing processes and observing the flow of materials, size of buffers, and line balancing. The traditional scenario - from the customer placing order for a product to delivery - goes through various phases including manufacturing the product. Several major electronics manufacturing stages can be addressed: fabrication, assembly...

09:20 – 09:40 **I-FA03-2**

Development of the Object-Oriented Virtual PLC Framework

Heon Jeong (Chodang Univ.)
and Han-Soo Choi (Chosun Univ.)

To remove the logical error inexpensively, in this paper, we propose new concept of VPLF(Virtual PLC Framework) which consists of VPLE(Virtual PLC Editor), Virtual Machine(Virtual Machine), VMC(Virtual Machine Control panel), Virtual PLC Program Editor(VPLPE) and Object Inspector. VPLC is for PLC hardware and software and VM is for the target to be controlled. VPLC has an individual editor and the screen of configuration. With using individual editor in VPLC, we can edit and compile to PLC ladder program. In VM, there are many kinds of object for machine elements, actuator, sensor and so on. The VPLC and VM are interlinked each other and controlled by the PLC program in real time. So, we can get the powerful realization as the machine is ...

09:40 – 10:00 **I-FA03-3**

Optimal Job Scheduling for RGV with multiple buffers

Chan-Doo Jeong, Su Jeong Lee, Jin-Ki Kim, Hak-Kyung Sung
(Institute of Intelligent System, Samsung Electronics Ltd.)

Suggesting the standard of optimal transferring for one RGV or two RGV, which have multiple buffers, using average delivery time and sigma in the straight line working place For performing the optimal transferring, present RGV-Job Dispatching algorithm, which is possible to apply in real-time, and apply random job occurrence conditions for examining the possibility to apply various real environments.

10:00 – 10:20 **I-FA03-4**

Walking Motion Detection via Classi cation of EMG Signals

H.-L. Choi, H.-J. Byun, W.-G. Song, J.-W. Son, and J.-T. Lim
(KAIST)

In this paper, we present a method to classify electromyogram (EMG) signals which are utilized to be control signals for patient-responsive walker-supported system for paraplegics. Patterns of EMG signals for dierent walking motions are classied via adequate filtering, real EMG signal extraction, AR-modeling, and modified self-organizing feature map (MSOFM). More efficient signal processing is done via a data-reducing extraction algorithm. Moreover, MSOFM classifies and determines the classified results are presented for validation.

10:20 – 10:40 **I-FA03-5**

Development of an EMG-based Powered Wheelchair Controller for Users with High-level Spinal Cord Injury

Jeong-Su Han, Dimitar H. Stefanov, Hae-Beom Lee, Dae-Jin Kim, Won-Kyung Song, Z. Zenn Bien, Kwang-Hyun Park (KAIST), Jong-Sung Kim (ETRI)

The objective of this paper is to develop a powered wheelchair controller based on EMG for users with high-level spinal cord injury. EMG is very naturally measured when the user indicating a certain direction, and the force information which will be used for the speed of wheelchair is easily extracted from EMG. Furthermore, the emergency situation based on EMG will be checked relatively ease. We classified the pre-defined motions such as rest case, forward movement, left movement, and right movement by Fuzzy Min-Max Neural Networks (FMMNN). This classification results shows the feasibility of EMG as an input interface for powered wheelchair. To make the system low cost and small size, we developed EMG AMP and its controller...