D-TP03 Factory Automation and CIM 2

13:00-15:00 **Chair : Kim Dae Won (Myongji Univ.)**
Room : 4129 **Co-Chair : Kwon Dong Soo (KAIST)**

13:00 – 13:20 **D-TP03-1**

Optimal Period and Priority Assignment Using Task & Message-based Scheduling in Distributed Control Systems

Kim Hyoung Yuk and Park Hong Seong
(Kangwon National Univ.)

In recent years, distributed control systems(DCS) using fieldbus such as CAN have been being applied to process systems but it is very difficult to design the DCS in order to guarantee the given end-to-end constraints such as precedence constraints, time constraints, and periods and priorities of tasks and messages. This paper presents a scheduling method to guarantee the given end-to-end constraints. The presented scheduling method is the integrated one considering both tasks executed in each node and messages transmitted via the network and is designed to be applied to a general DCS that has multiple loops with several types of constraints, where each loop consists of...

13:20 – 13:40 **D-TP03-2**

A Development for Web-based Name-plate Production System by using Image Processing

Kim Gibom and Cho Jin Youn
(Dept. of Manufacturing Engineering, SNUT)

In this paper, manufacturing system and Internet are combined and NC milling machine engraves image and text on nameplate. Image and text are input through Internet. And NC tool path is obtained by thinning algorithm and NC part program is generated. Thinning algorithm detects center lines from image and text by using connectivity and tool path is obtained along the center line. Actually experiments are performed and thinning algorithm and G-code generation module are verified.

13:40 – 14:00 **D-TP03-3**

Develeopment of an Extended EDS Algorithm for CAN-based Real-Time System

Lee Byong Hoon, Kim Dae Won and Kim Hong Ryeol
(Myongji Univ.)

Usually the static scheduling algorithms such as DMS(Deadline Monotonic Scheduling) or RMS(Rate Monotonic Scheduling) are used for CAN scheduling due to its ease with implementation. However, due to their inherently low utilization of network media, some dynamic scheduling approaches have been studied to enhance the utilization. In case of dynamic scheduling algorithms, two considerations are needed. The one is a priority inversion due to rough deadline encoding into stricted arbitration fields of CAN. The other is an arbitration delay due to the non-preemptive feature of CAN. In this paper, an extended algorithm is proposed from an existing EDS(Earliest Deadline Scheduling) approach of CAN scheduling algorithm having a solution to the priority inversion...

14:00 – 14:20 **D-TP03-4**

EIT Image Reconstruction using Genetic Algorithm

Kim Hochan, Moon Dongchun, Kim Minchan and Lee Yoonjoon
(Cheju National Univ.)

Electrical impedance tomograpy (EIT) determines the resistivity distribution inside an inhomogeneous target by means of voltage and current measurements conducted at the target boundary. In this paper, a genetic algorithm (GA) approach is proposed for the solution of the EIT image reconstruction. Results of numerical experiments of EIT solved by the GA approach are presented and compared to that obtained by the modified Newton-Raphson method. The GA approach is relatively expensive in terms of computing time and resources, and at present this limits the applicability of GA to the field of static imaging. However, the continuous and rapid growth of computing resources makes the development of real-time dynamic imaging applications based on GA's conceivable in the near future.

14:20 – 14:40 **D-TP03-5**

The Relay Circuit to EMFG Conversion with a Box's Characteristic Equation

Paek Hyung-Goo and Yeo Jeong-Mo
(Pukyong National Univ.)

It is very difficult to design and analyze the relay circuit because one have to cinsider and analyze in order the behavior in which the relay contacts. In this paper, we propose the relay circuit to EMPG (Extended Mark Flow Graph) convension with a box's characteristic equation. It will give you a lot of benefits in case of analysis and check of the relay circuit to convert the relay circuit into EMPG.