D-TE02 Control Virtual Manufacturing

15:20-17:20 **Chair : Lee Man Hyung (Pusan National Univ.)**
Room : 4128 **Co-Chair : Yoon Ji Sup (KAERI)**

15:20 – 15:40 **D-TE02-1**

A Study of 3-Dimension Graphic Monitoring System for Spent Fuel Dismantling Process

Kim Sung-Hyun, Song Tae-Gil, Lee Jong-Youl and Yoon Ji-Sup
(Korea Atomic Energy Research Institute)

To utilize the uranium resources contained in the spent nuclear fuel generated from the nuclear power plants, the remote handling and dismantling technology is required. The dismantling process of the spent fuel is the most common process involved in the spent fuel recycling, the rod consolidation and the disposal processes. Since the machine used in the dismantling process are located and operated in isolated space, so called a hot cell, the reliability of machines is very important. To enhance the reliability of the process, in this research, the graphical monitoring system is developed for the fuel dismantling process. The graphic model of each machine is composed of many parts and every parts of the graphic model are given their own kinematics. Using the kinematics and simulating the graphic model in the virtual environment, the validity of the conceptual dasign can be verified before ...

15:40 – 16:00 **D-TE02-2**

A Study on the Application of Virtual Manufacturing Technology for an Automotive Plant

Sohn Chang Young, Noh Sang Do, Hahn Hyung Sang, Lee Chang Ho, Hong Sung Won and Kim Duck Young
(LAE)

Nowadays, one of the major technical issues in manufacturing is how to implement an virtual plant as an well-designed, integrated environment for sharing information and engineering collaboration among diverse engineering activities. The systematic approaches to make a virtual plant based on a 3-dimensional CAD, cell and line simulation, database and internet technologies are proposed in this paper. To do that, measuring and 3D CAD modeling technologies of many equipments, facilities and structures of the building are developed, effective management of information including models and related files in WWW environment is implemented, and precise simulations of unit cell and whole structured plant are performed. For the beginning of implementing a Virtual Automotive Plant, the Virtual Plant for the Body Shop of a Korean automotive company is constructed and implemented. Using this Virtual Plant...

16:00 – 16:20 **D-TE02-3**

Improvement of Mass Flow and Thickness Accuracy in Hot Strip Finishing Mill

Hong Sung C.
(POSCO)

Finishing mill (FM) is set up with rolling conditions (rolling speed, rolling force, roll gap, etc.) calculated by a FSU (Finisher Setup) model considering the temperature, qualities and size of a transfer bar and a strip at the entry and exit of FM before the transfer bar is rolled through FM. If the accuracy of setup is low mass flow unbalance occurs, so that the accuracies of the strip thickness and width become lower or rolling operation fault occurs. Therefore, to enhance the performance of the FSU model and to improve mass flow and the thickness accuracy of a strip in the 7-stand finishing mill using a hot strip speed measurement system. This study is being performed. In this paper, the speed measurement system, a developed neural network for predicting ...

16:20 – 16:40 **D-TE02-4**

Double sheet detection system for feeder robots in automation line

Kim Dae-Nyeon, Jo Kang-Hyun, Shin In-Seung, Kim Ki-Su, Kim Tae-Ho, Kang Hyun-Duk, Yoon Yeon-Hong, Kim Se-Yoon and Lee Seung-Choon
(Univ. of Ulsan)

We suggest a system to detection whether material picked up is double or single when the robot feeds them in automation line. This system measures thickness of metal plate and alarms when they are double sheet measuring boundary lines of metal sheet. This system calculates the minimum distance of straight boundary lines by eliminating noise in the edge regions. In the experimental system, double or single is determined by calculating implemented the thickness in the image where the distance of pixels are retrieved by the hash table.In this paper, the algorithm of histogram is adapted to experiment in the implement, thus proved as double sheet detection system.

16:40 – 17:00 **D-TE02-5**

Optimal supervisory control for multiple-modelled discrete event systems

Lee Moon-Sang and Lim Jong-Tae
(KAIST)

In this paper, we present a procedure to design the robust optimal supervisor which has the minimal cost in the sense of average for a given multiple-modelled discrete event system (DES). In order to design the robust optimal supervisor, we extend the optimal supervisor design algorithm for a deterministic DES to the case of multiple-modelled DESs. In addition, using the proposed algorithm with modified costs of events and penalities of states, we can show whether a robust supervisor for a given multiple-modelled DES exists and design the minimally restricted robust supervisor

17:00 – 17:20 **D-TE02-6**

Hierarchical Decentralized Supervisory Control of Discrete Event Systems

Seong Gyu Kim and Jong Tae Lim
(KAIST)

In this paper, we consider a hierarchical decentralized supervisory control of discrete event systems under partial observation in two-level hierarchical structure since the observability is a practical and general property in modeling of real systems. Hierarchical consistencies of controllability and observability on the hierarchical decentralized supervisory control are investigated and relevant conditions are proposed to ensure such hierarchical consistencies.