I-SA05 Remote Sensing and Control

09:00-11:00 **Chair : Choi Gi H. (Hansung Univ.)**
Room : C204 **Co-Chair : Kim Sang-Bong (Pukyong National Univ.)**

09:00 – 09:20 **I-SA05-1**

Development of Real Time Monitoring and Forecasting/Emergency System for Land Slide of Road

Choon-Sik Kim, Soo-Ho Yoon (Korea Univ.)
Seung-Mok Shin, Hur Chul , Sang-Bong Kim (Pukyong National Univ.)

This paper introduces a real time inspecting and monitoring system by using wireless communication and image processing techique. The communication system is developed by using 80c196kc microprocessor and it has data acquisition function for several kinds of sensors such as pluviometer, temperature, tension meter, elinometer and so on. The image processing method adopts Lalacian of Gaussian operator and least square method to extract line features for the captured images and uses a relaxation matching algorithm based in global structure constraint satisfaction to distinguish the matching error for those features. When the algorithm is processed, motion parameters of displacement area and its direction are computed. Once movement is recognized ...

09:20 – 09:40 **I-SA05-2**

Design of A Data Transmission System for Pneumatic System Control

Chun Pyo Hong (Taegu Univ.),
Dong Soo Kim(KIMM)

For pneumatic system control, we need a data transmission system with high speed and reliability for information interchange between main computer and I/O devices. This paper presents a set of design techniques for a data communication system that is mainly used for pneumatic system control. For this purpose, we first designed hardware modules for an interface between central control module and local node that handles the operation of solenoid valves. In addition, we developed a communication protocol for construction of RS-485 based multi-drop network, and this protocol is basically designed with a kind of polling technique. Finally we evaluated performance of the developed system. The field test results show that, even under high noise environment, the data transmission of 375Kbps rate is ...

09:40 – 10:00 **I-SA05-3**

LonWorks-based Distributed Monitoring and Control for Predictive Maintenance (PM)

Gi Heung Choi
(Hansung Univ.)

Requirements for Distributed Monitoring and Control Networks (DMCN) differ greatly from those of typical data networks. Specifically, any DMCN technology which employs a fieldbus protocol is different from IP network protocol TCP/IP. In general, one needs to integrate fieldbus protocol and TCP/IP to realize DMCN over IP network or internet. Interoperability between devices and equipments is essential to enhance the quality and the performance of predictive maintenance (PM). This paper suggests a basic framework for LonWorks-based DMCN over IP network and a method to guarantee interoperability between devices and equipments.

10:00 – 10:20 **I-SA05-4**

Development of a Geometry PIG for the Inspecti on of Natural Gas Pipeline and It's application

Dong-Kyu Kim, Sung-Ho Cho, Seoung-Soo Park, Dae-Jin Park
Sung-Ja Koo, Hui-Ryong Yoo,Yong-Woo Rho, Young-Tai Kho
(KOGAS)

The geometry PIG provides pipeline operators with continuous measurement of pipe centerline coordinates, bend radius, displacement, and bending strain in a single pass through the pipeline. This study introduces the developed geometry PIG(Pipeline Inspection Gauge) which is used for geometry surveys. This tool is equipped with the several sensor systems. The Inertial Navigation System (INS) comprises angle rate gyros and linear accelerometers. The system measures the precise path of the PIG during its traverse of the pipeline. This system is also used to produce a detailed map of the line, measure curvature. Odometers measure the PIG's distance moved along the line and instantaneous speed during the PIG run. Caliper sensors measure pipeline ...

10:20 – 10:40 **I-SA05-5**

Repetitive Compensation Control for AGC System By Using Pre-Pass Rolling Data

Hwan Seong KIM(Korea Maritime), Jin Seon PARK, Sang Dol Lee,
Keum Jae Lee, Sung Kwan Park (DongKuk Univ.)

This paper deals with a modified repetitive control method for compensating automatic gauge control (AGC) to reduce the effect of skid mark which directly influence the quality of products in plate mill process. Since the skid mark on the plate have thermal difference, it makes a different stretching rate and deflection of thickness. Firstly, the AGC system and the plate mill process are described by considering function in each control levels. The skid mark of the plate in practical control fields is shown. Also, its frequency variation is given by on-line FFT analysis method. Secondly, a key idea of the modified repetitive control method with time varying period disturbance is represented and compared with standard repetitive control method. Lastly, in simulation ...