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  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 technique. 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, clinometer 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  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  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  Development of a Geometry PIG for the Inspection 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  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 ...

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