D-FA05 Fault Diagnosis

09:00 – 11:00 **Chair : Park Young-Jin (KAIST)**
Room : 4134 **Co-Chair : Kang Hoon (Chungang Univ.)**

09:00 – 09:20 **D-FA05-1**

Fault Diagnosis for Electric Chassis System

Ryu Seongpil, Kwak Byunghak, Park Youngjin(KAIST)
and Jung Hunsang(Mando Corps.)

In the near future, drive-by-wire systems will replace mechanical systems of vehicles. Since there would be no mechanical redundancy in the x-by-wire subsystem, it needs to improve the reliability of the system using fault diagnosis of sensors and actuators. This paper proposes a Kalman filter based fault diagnosis method for the vehicle with the drive-by-wire system, which includes steer-by-wire, brake-by-wire and throttle-by-wire systems. We will show that the proposed method is successful in fault detection and isolation for single sensor/actuator faults of the vehicle system.

09:20 – 09:40 **D-FA05-2**

Design and Operation of 3MW Pilot Plant of $Mg(OH)_2$ Flue Gas Desulfurization Process

Kim In-Won, Jin Sang-Hwa(Konkuk University), Choi Byung-Moon(Kyunggi Chemicals) and Lee Hyung Keun(KIER)

Korea Institute of Energy Research(KIER) has designed the 3MW pilot scale wet FGD process based on the experimental results of the bench scale FGD system which can treat 150 m3/hr of flue gases. The effects of process chemistry, packing material, and operating variables including L/G ratio, pH, scrubber pressure drop were investigated. In cooperation with Kyunggi Chemicals, the 3MW pilot scale plant was established on the industrial site at Onsan, Korea. This system has been operating since October 1999. This paper introduces an outline of the design features of the pilot plant and discusses its operational results.

09:40 – 10:00 **D-FA05-3**

Diagnosis of Thickness Quality Using Multivariate Statistical Analysis in Hot Finishing Mill

Kim Heung Mook
(POSCO)

A diagnosis methodology for thickness quality in hot finishing mill is proposed based on multivariate statistical analysis. The thickness of hot strip is a key quality factor that is measured by x-ray thickness gauge. Currently, the thickness quality is guaranteed by upper and lower limit of thickness deviation from target thickness. But if any over-limit is occurred, there is no in-line method to identify the causes. In this paper, many parameters are extracted from the thickness deviation signal such as mean deviation(top, middle, tail), rms deviation(top, middle, tail) and peak deviation(top, middle, tail) as time domain parameters...

10:00 – 10:20 **D-FA05-4**

Robust Analysis for Configuration of Redundant Intertial Sensors

Yang Cheol Kwan, Kim Jeong Yong and Shim Duk-Sun
(Chung-Ang University)

We consider a robust configuration problem of inertial sensors for inertial navigation system(INS). Fault detection and isolation(FDI) is necessary to improve reliability of the system. For FDI, there used to be more than three mutually orthogonal sensors and thus we have to consider configuration methods of sensors. Various studies in this area have been done, but the former results did not consider effect of uncertainty(misalignment, scale factor error) to determine the configuration of the sensors. In this paper robust configuration of sensors is proposed through sensitivity analysis. Also total least square(TLS) method...

10:20 – 10:40 **D-FA05-5**

Optimal IMU Configurations for a SDINS

Kim Kwang-Hoon, Lee Jang-Gyu(Seoul National University),
Shim Duk-Sun(Chung-Ang Univ.)
and Park Chan-Gook(Kwangwoon Univ.)

When inertial navigation system(INS) employ more sensors that mutually orthogonal sets to three, the redundant sensor system can have improved reliability and accuracy. For the redundant system the placement of redundant sensors is related to the system performance and also the number and proper orientation of sensors are important. We consider INS sensor configurations using two IMUs comprised mutually orthogonal sets of three. We suggest several configurations using two IMUs and analyze the system performance and the FDI(fault detection and isolation) properties from suggested configurations.