D-SP04

Aerospace Technology

13:00 – 13:20   **D-SP04-1**

Design of a Reorganization and Non-Uniformity Correction Module for CCD Pixels in MSC(Multispectral Camera)

Jon-Pil Kong, Sang-Soon Yong, Haeng Pal Heo, Young-Sun Kim
Hong-Yul Paik
(KARI)

This paper describes the design of a NUC(Non-Uniformity Correction) module in MSC(Multispectral Camera) which will be a payload on KOMPSAT . This module is required inside a system with data compression module like MSC to minimize the loss of imagery due to non-uniform characteristics between CCD pixels when the imagery is received and processed on a ground station. It comprises Hotlink input/output for imagery data, RS-422 interface with main controller in MSC, a number of SRAMs for storing imagery data and parameters, FPGA controllers which control the entire NUC module under the control of main controller, etc. It inputs 8-channel imagery pixel data which consist of 2-channel MS(Multispectral) band and ...

13:40 – 14:00   **D-SP04-3**

Design of In-Motion Alignment System of SDINS using Robust EKF

Hong Hyun Su, Lee Jang Gyu(Seoul National Univ.)
Park Chan Gook(Kwangwoon Univ.)

In this paper, the design of the in-motion alignment system of Strapdown Inertial Navigation System(SDINS) using Robust Extended Kalman Filter(REKF) is presented. The compensation of errors in the aided navigation system is accomplished by the indirect feedback filtering. The performance of the aided navigation algorithm is very sensitive to the accuracy of the initial estimate, which is the characteristic of the EKF. Unfortunately, the initial attitude error can be very large during the in-motion alignment. To overcome the in-motion alignment under large initial attitude error problem, the REKF using linear robust filtering technique is proposed. The linear robust H_2 filter can be adopted for nonlinear ...

13:20 – 13:40   **D-SP04-2**

Error Analysis of the Navigation System with Asynchronous Gyros

Kwang-Jin Kim, Tae-Gyoo Lee
(Agency for Defense Development)

The asynchronous gyro outputs in the 3-axis navigation system are defined as each of gyros has its own output frequency. In this case, the navigation system has gyro outputs concurrently with the sensor mechanical frequency instead of the attitude frequency. So, there is an asynchronous error between gyro outputs and attitude calculation. In this paper, we analyze the gyro output error caused by the asynchronous gyro and present the high speed sampling technique and the extrapolation and interpolation of gyro outputs for synchronizing the gyro outputs.

14:00 – 14:20   **D-SP04-4**

Design of Nonlinear Fixed-Interval Smoothing Filter and Its Application to SDINS

Yu Jaejong, Lee Jang Gyu, Hong Hyun Su(Seoul National Univ.)
Han Hyung Seok(Kyungwon Univ.)
Park Chan Gook(Kwangwoon Univ.)

In this paper, we propose a new type of nonlinear fixed interval smoothing filter which is modified from the existing nonlinear smoothing filter. A nonlinear smoothing filter is derived from two-filter formulas. For the backward filter, the propagation and update equation of error states are derived. Particularly the modified update equation of the backward filter use the estimated error terms from the forward filter. Smoothing algorithm is altered into the compatible form with the new type of the backward filter. An advantage of the proposed algorithm is more efficient than the existing one because propagation in backward filter is very simple from the implementation point of view. We apply the proposed nonlinear smoothing ...