WA02 Unmanned Aerial Vehicles

Time : 09:00 - 11:00 **Chair : Prof. Doo Yong Lee (KAIST, Korea)**
Room : B (320B)

09:00 ~ 09:20 WA02-1

Optimal Phantom Track Generation for Multiple Electronic Combat Air Vehicles

Il hyoung Lee, Hyochoong Bang(KAIST, Korea)

This paper present a cooperative control scheme for electronic attack of multiple Electronic Combat Air Vehicle(ECAV). The stealthy ECAVs equipped with ECM(Electronic Counter measures) can deceive a radar by using range delay deception technique. This make the radar to detect a fake target called Phantom beyond the ECAV location. The important feature of generating phantom track is kinematic and dynamic constraints. These constraints restrict the freedom of Phantom tracks. Optimal cooperative control problem to deceive radar networks using multiple ECAVs is formulated to and some approaches to solving the technical problems are described.

09:20 ~ 09:40 WA02-2

3D Depth Estimation for Target Region using Optical Flow and Mean-Shift Algorithm

Seon Yeong Jo, Jong hun Kim, Jeong ho Kim, Dae woo Lee, Kyeum rae Cho(Pusan National University, Korea)

- Mean-Shift algorithm offers an ability to pursue target after setting region of interest (ROI) without searching whole sequence.
- The first method is introduced as Heegel &Jepson's Subspace Method and second method uses regional Optical Flow information and camera motion information on the monocular camera sequences.
- The same thing of both methods is that optical flow used for depth estimation.
- Subspace method uses residual function from least square method.

09:40 ~ 10:00 WA02-3

Fuzzy Logic PID Based Control Design and Performance for a Pectoral Fin Propelled Unmanned Underwater Vehicle

Jason Geder, John Palmisano, Ravi Ramamurti, William Sandberg, Banahalli Ratna(United States Naval Research Laboratory, United States)

This paper describes the modeling, simulation, and control of a UUV in six degree-of-freedom (6-DOF) motion using two NRL actively controlled-curvature fins. Computational fluid dynamic (CFD) analysis and experimental results are used in modeling the fin as part of the 6-DOF vehicle model. A fuzzy logic proportional- integral-derivative (PID) based control system has been developed to smoothly transition ...

10:00 ~ 10:20 WA02-4

Flight Test Results of Automatic Tilt Control for Small Scaled Tilt Rotor Aircraft

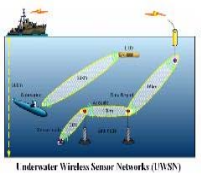
YoungShin Kang, Bumjin Park, Changsun Yoo, Yushin Kim, Samok Koo(Korea Aerospace Research Institute, Korea)

- A small scaled flight model of the tilt rotor aircraft for the Smart UAV Program at KARI(Korea Aerospace Research Institute) has been developed and tested.
- Since the flight characteristics of a tilt rotor aircraft are new to KARI, the scaled model was used as a test bed to evaluate the flight control algorithm for the full scale Smart UAV.

10:20 ~ 10:40 WA02-5

Distributed Target Tracking Algorithm in Underwater Wireless Sensor Networks

Chang Ho Yu, Kang Hoon Lee, Jae Weon Choi, Young Bong Seo(Pusan National University, Korea)



In this paper, we propose a distributed tracking algorithm for a moving target through UWSNs. We consider a single target tracking problem only and address the issues of estimating target position and improving energy efficiency by applying a Kalman filter in a distributed architecture. To estimate the states of the target, we propose the energy efficient tracking algorithm using the WuS and VMS scheme for a distributed target tracking.

10:40 ~ 11:00 WA02-6

Backstepping Sliding Mode Controller Design for a Flying Quadrotor

Haider Mohamed, Mahmoud Moghavvemi, Soo Siang Yang(University of Malaya, Malaysia), Hayder Al-Assadi(Multimedia University, Malaysia)

This paper presents the design of a backstepping sliding mode controller for a quadrotor vertical take-off and landing (VTOL) unmanned air vehicle. This controller sets the quadrotor to fly to the desired three space positions (x, y, z) while controlling its yaw angle. In addition, the controller is designed to stabilize the pitch and roll angles. To ensure stability of the overall system, the backstepping controller is designed based on the Lyapunov stability theory. Various simulations of the model show that the control law stabilizes the quadrotor with good tracking. To verify the performance of the proposed backstepping controller, simulations using ...