D-TMP02 Domestic Poster Session

14:00-14:50 **Chair : Han Chang Soo (Hanyang Univ.)**
Room : Terrace(3F) **Co-Chair : Kim Jeong-Ha (Kookmin Univ.)**

14:00 – 14:50 **D-TMP-37**

A Region Search Algorithm and Improved Environment Map Building for Mobile Robot Navigation

Kwang-Sik Jin, Suk-Yoon Jung, Jung-Su Son
Tae-sung Yoon
(Changwon Univ.)

In this paper, an improved method of environment map building and a region search algorithm for mobile robot are presented. For the environment map building of mobile robot, measurement data of ultrasonic sensors and certainty grid representation is usually used. In this case, inaccuracies due to the uncertainty of ultrasonic data are included in the map. In order to solve this problem, an environment map building method using a Bayesian model was proposed previously[5]. In this study, we present an improved method of probability map building that uses infrared sensors and shift division Gaussian probability distribution with the existing Bayesian update method using ultrasonic sensors. Also, a region search algorithm for ...

14:00 – 14:50 **D-TMP-38**

Nonlinear System Modelling Using Neural Network and Genetic Algorithm

Hong-Bok Kim, Jung-Keun Kim, Seung-Wook Hwang,
Yun-Su Ha, Gang-Gyoo Jin
(Korea Maritime Univ.)

This paper deals with nonlinear system modelling using neural network and genetic algorithm. Application of neural network to control and identification is actively studied because of their approximating ability of nonlinear function. It is important to design the neural network with optimal structure for minimum error and fast response time. Genetic algorithm is getting more popular nowadays because of their simplicity and robustness. In this paper, We optimize neural network structure using genetic algorithm. The genetic algorithm uses binary coding for neural network structure and search for optimal neural network structure of minimum error and response time. Through extensive simulation, Optimal neural network structure is shown to be effective for ...

14:00 – 14:50 **D-TMP-39**

An Implementation of Stabilizing Controller for 2-Axis Platform using Adaptive Fuzzy Control and DSP

Gi-seok Ryu, Jin-Kyu Kim, Jang-Ho Park, Dae-Young Kim,
Jong-Hwa Kim
(Korea Maritime Univ.)

Passive Stabilization method and active stabilization method are mainly used to comprise a control system of platform stabilizer. Passive Stabilization method has demerits because of size and weight except that control sturcture is simple while active stabilization method using sensors can reduce size and weight, it requires high sensor technique and control algorithm. In this paper, a stabilizing controller using adaptive fuzzy control techinique and floating-point processor(DSP) is suggested.

14:00 – 14:50 **D-TMP-40**

Swing Up and Stabilization Control of the Pendubot

Ki-Jeong Yoo, Dong-Hoon Yang, Suk-Kyo Hong
(Ajou Univ.)

This paper presents swing up and stabilization control of an underactuated two-link robot called the Pendubot. This device is a two-link planar robot with an actuator at the shoulder, but no actuator at the elbow. The controller swings up first link from its open loop stable equilibrium point to the unstable equilibrium point and then, catches the unactuated second link to balance it there. Two control algorithms are used for this task. Proportional Derivative Control technique is used to design the swing up control. The linear model of Pendubot is obtained by linearizing the nonlinear dynamic equations about the desired equilibrium point and LQR technique is used to design a stabilization controller.

14:00 – 14:50 **D-TMP-41**

Vibration Control of a Flexible Cantilevers Beam with Added Mass

Tae-Kyu Kwon, Byeong-Yong Choi, Suk-Jeong Lim, Yeo-Hung Yun,
Seong-Cheol Lee
(Chonbuk National Univ.)

This paper presents the vibration control of a flexible intelligent beam with added mass. The materials which is a glass fiber reinforced(GFR) thermoplastic composite is employed to achieve vibration characteristics according to added mass induced end of composite beam. In the experiments of forced vibration control, the -controller are employed to achieve vibration suppression in forced vibration situations. Also, in the controller design, 1st and 2nd's natural frequencies are considered in the modeling, because robust control theory which has robustness to structured uncertainty is adopted to suppress the vibration. By designing a controller using mu-synthesis, robust performance against measurement noise, various modeling.