I-SP07

Automation Control

13:00-15:00
Room : C207

Chair : Ahn Doo Sung (Pukyong National Univ.)
Co-Chair : Choi Jae Weon (Pusan National Univ.)

13:00 – 13:20   **I-SP07-1**

Experimental study on practical automatic snowplows

Soichiro Suzuki, Hiroshi Kumagami, Katsumi Miyakoshi, Hiroyuki Haniu and Hideyuki Tsunemoto(Kitami Institute of Technology)

In this study, control technique of two types of automatic snowplow was experimentally investigated. One is a remote-controlled snowplow used for removing snow around houses, and the other is an autonomous snowplow for use in wide, open spaces such as a parking lot of a large-scale retail store. A commercially available snowplow was modified to enable remote control by the use of a personal handy-phone system. The autonomous controller utilizes a vision sensor that consists of a CCD video camera and a computer for image processing. In addition, design of a practical landmark was examined.

13:40 – 14:00   **I-SP07-3**

A Study on the Automatic Lane Keeping Control Method of a Vehicle Based upon a Perception Net

K. Kyungkeun, S. Jeonghoon, and B. Kwangsuck
(Inje Univ.)

The objective of this research is to monitor and control the vehicle motion in order to remove out the existing safety risk based upon the human-machine cooperative vehicle control. A new control method is proposed to control the steering wheel of the vehicle to keep the lane. Desired angle of the steering wheel to control the vehicle motion could be calculated based upon vehicle dynamics, current and estimated pose of the vehicle every sample steps. The vehicle pose and the road curvature were calculated by geometrically fusing sensor data from camera image, tachometer and steering wheel encoder though the Perception Net, where not only the state variables, but also the corresponding uncertainties were propagated in ...

14:20 – 14:40   **I-SP07-5**

Cruise Control of Automated Mechanical Transmission Automobiles

Guihe Qin, Anlin Ge(Jilin Univ.)
Jiehong Zhao(ChangChun engineering College)
Ju-Jang Lee(KAIST)

In the paper, a cruise control system developed for the automobile with automated mechanical transmission (AMT) is introduced. After the AMT is concisely depicted, the paper details the functions, the points of the work, the principle of operation and the design course of the cruise control system.

13:20 – 13:40   **I-SP07-2**

Individual Cylinder Spark Advance Control Using Cylinder Pressure in SI Engines

Seungbum Park, Myoungho Sunwoo(Hanyang Univ.) Paljoo Yoon(Mando Corporation)

This paper presents an individual cylinder spark advance control strategy based upon the location of peak pressure (LPP) in spark ignition engines using artificial neural networks. The LPP is estimated using a feedforward multi-layer perceptron network (MLPN), which needs only five samples of output voltage from the cylinder pressure sensor. The cyclic variation of LPP restricts the gain of the feedback controller, and results in poor regulation performance during the transient operation of the engine. The transient performance of the spark advance controller is improved by adding a feedforward controller which reflects the abrupt changes of the engine operating conditions such as engine speed and manifold absolute pressure (MAP). ...

14:00 – 14:20   **I-SP07-4**

Hybrid Control for the Platoon Maneuvers with Lane Change

Seong Min Jeon and Jae Weon Choi
(Pusan National Univ.)

Many physical systems today are modeled by interacting continuous and discrete states that influence the dynamic behavior. Hybrid system models, suitable for describing the essential dynamics of a fairly large class of physical systems in control engineering applications, contain both continuous dynamics and discrete dynamics. We discuss the design of efficient hybrid controllers for the platoon maneuvers on an AHS. For the modeling of a hybrid system including the merge and split operations, we introduce the safety distance policy for the merge and split operations. Then, the platoon system will be modeled by a hybrid system. In addition, the hybrid controller for the proposed merge and split operation models will be presented. Finally, we will demonstrate our scenarios...