

TM03-19

**Classify Layer Design for Navigation Control of Line-Crawling Robot : A Rough Neurocomputing Approach**

Taechon Ahn(Wonkwang Univ., KOREA), James F. Peters, Maciey Borkowski(Univ. of Manitoba, CANADA)

This paper considers a rough neurocomputing approach to the design of the classify layer of a Brooks architecture for a robot control system. The Paradigm for neurocomputing that has its roots in rough set theory, and works well in cases where there is uncertainty about the values of measurements used to make decisions. In the case of the line-crawling robot (LCR) described in this paper, rough neurocomputing is used to classify sometimes noisy signals from sensors. The LCR is a robot designed to crawl along high-voltage transmission lines where noisy sensor signals are common because of the electromagnetic field surrounding conductors. In rough neurocomputing, training a network of neurons ...

TM03-20

**Remote Measurement of ECU Self-Diagnostic Signal based on the Windows CE**

Seong-Cheol Lee, Yeo-Hung Yun, Ji-Won Se, Tae-Kyu Kwon, Young\_Chun Lee(chonbuk nat'l univ., KOREA), Bong-Choon Jang(General Motors Co., USA)

The purpose of this paper is to monitor ECU's self-diagnostic signal without wire. In order to measure the ECU's self-diagnostic signal, the interfaced circuit is developed to communicate ECU with a designed display terminal according to the ISO, SAE regulation of communication protocol standard. An 80C196KC processor is used for communicating ECU's self-diagnostic signal and communication data are sent to PDA monitoring system that is based on the Windows CE. Software on PDA is developed to monitor the ECU's self-diagnostic signal in which RS232 port is programmed by half duplex method. The algorithms for measuring the ECU's self-diagnostic signals are verified to mo...

TM03-21

**Exhaust Gas Recirculation Control in a Spark-Ignition LPG Engine Using Neural Networks**

Hongwei Cui, Yifang Liu, Yujian Zhai(Southeast Univ., CHINA )

This paper presents a neural network approach to control exhaust gas recirculation(EGR) in a Liquefied Petroleum Gas(LPG) engine. In order to meet increasingly stringent automotive exhaust emission regulations, alternative fuels such as LPG engines have been developed in many countries. HC&CO emissions of LPG engines can be easily reduced through air-fuel ratio control, but the control effect on NOx reduction is not good enough. Consequently EGR system is introduced to achieve a significant reduction in NOx emissions. Conventional EGR control uses the mapping method. The calibration time is long and the work is complex when adopting this mapping method. However neural networks are suitable f...

TM03-22

**Design of a Fault-tolerant Embedded Controller for Railway Signaling Systems**

Yong-Gee Cho, Jae-Sik Lim (LGIS, KOREA)

- This report presents an implementation a set of reusable software components which use of fault-tolerance embedded controller for railway signalling systems. These components can be used in real-time applications without application reprogramming.
- This library runs under VxWorks operating system and is oriented on real-time embedded systems. The library includes fault detection, fault containment, checkpointing and recovery components.
- The library enables to support high-speed response to fault occurrence in application software. Garbage collector together with VxWorks Watchdog provides both dead tasks detection and useless resources removing to avoid an overflow. Control flow...

TM03-23

**A Performance Test Equipment for Rechargeable Electric Tools**

Jong Kwang Lee, Hyo-Jae Lim, Min-Kyu Choi(Chungnam Nat'l Univ., KOREA), Jin-Ha Koh, Kyu-Won Lee(Keyang Electric Machinery Co. Ltd., KOREA), E-Sock Kang(Chungnam Nat'l Univ., KOREA) For the performance test of rechargeable electric tools, it is necessary to test under the same condition as the actual operation condition. They are necessary to control the load torque and to acquire the test data with a computer, and it should be convenient to fix the tool on the test equipment for rechargeable electric tools. It consists of torque loading parts, sensing parts and control software. Two hysteresis brakes, connected serially with flexible coupling, were applied to control the load for the test. The sensing part consists of a torque sensor, a rpm detector and a power analyzer. The torque and the rpm were measured in order to calculate the output of the rechargeable electric ...

TM03-24

**PC-based 3D graphic spacecraft simulator using OpenGL**

Seung-Jun Kim, Sang-Wook Lee, Woo-Seong Jeong, Byung-Ha Ahn(K-JIST, KOREA)

- We solved the attitude regulation and tracking problems of spacecrafts.
- We developed a PC-based 3D spacecraft simulator using OpenGL.
- We considered the rigid spacecrafts with gas-jet and reaction wheel actuator.
- In order to verify the effectiveness of the simulator, we applied the output-based controller.
- Spacecraft models are animated by roll-pitch-yaw angles, constantly processed by numerical method.