D-FE02

Mobile Robot 2

15:20 – 15:40   **D-FE02-1**

Development of a Guide Robot with Real-Time Linux OS

Mun Hak-Jun, Seo Yeon-Gon and Kim Jin-Oh
(Kwangwoon Univ.)

A new method for a guide robot using Real-Time Linux OS is introduced in this paper. A guide robot is to guide people in museums or buildings. So it has to be more reliable and stable in its control system. In addition, it has to satisfy Real-Time operation requirement because it needs to react to changing environment promptly. The task includes localization, map building, collision avoidance, path planning, and user interface software. The modular guide robot is designed with Real-Time Linux OS, which is composed of many open sources for scheduler, interrupt dispatcher, fifos, shared memory, timer services. We developed application software to satisfy the given task. The developed guide robot moves at $0.2ms$ and the interrupt latency is less than $100\mu s$. It is thought that the developed system can be a stable and low cost open architecture robot controller for …

16:00 – 16:20   **D-FE02-3**

On the ZMP of biped robot (Visualization of ZMP)

Sang-Hak Sung, Young-il Youm, Wan-Kyun Chung
(POSTECH)

Many locomotion purpose robots are being built and are under research such as mobile manipulator and biped humanoid robot, etc. Dynamic posture stability of these robots is based on the ZMP point. For getting stable ZMP trajectory, some method has been developed but is too complex and time consuming which leads to inability in generating on-line ZMP trajectory. In this paper, we give a qualitative study about behavior of ZMP in biped walking robot through visualization. This result gives intuitive understanding about behavior of ZMP under various robot state.

16:40 – 17:00   **D-FE02-5**

Reliability Analysis of Underwater Mobile Robot for Automated Reactor Inspection using Bayesian Belief Nets

Eom Heung Seop and Kim Jae Hee
(KAERI)

This paper proposes a method that combines diverse evidence relevant to the reliability to evaluate the reliability of complicated systems such as robots. In practice, reliability experts combine diverse evidences relevant to the reliability and infer the answers by using their own way that are mostly informal. The proposed method also combines diverse evidence and performs inferences but in formal and quantitative way by using the benefits of Bayesian Belief Nets (BBN). Diverse evidences could be those from dassical analysis techniques, test results, quality assurance about the process of manufacturing, and the quality of the company or development team, etc. Some of these evidences are qualitative and others are quantitative. Both are …

15:40 – 16:00   **D-FE02-2**

Development of Intelligent Mobile Robot with electronic nose

Hyung-Gi Byun, Yu-Kyung Ham, Jung-Do Kim, (Samchok Univ.),
Ji-Hyeok Choi(Sungkyunkwan Univ.) and Won-Ryul Shon

We have been developed an intelligent mobile robot with an artificial olfactory function to recognize odours and to track odour source location. This mobile robot also has been installed an engine for speech recognition and synthesis, and is controlled by wireless communication. An artificial olfactory system based on array of 7 gas sensors has been installed in the mobile robot for odour recognition, and 11 gas sensors also are located in the bottom of robot to track odour sources. 3 optical sensors are also included in the intelligent mobile robot, which is driven by 2 D.C. motors, for clash avoidance in a way of direction toward an odour source. Throughout the experimental trails, it is confirmed that the intelligent mobile robot is capable of not only the odour recognition using artificial neural network algorithm, but also the tracking odour source using the step-by-step approach method…

16:20 – 16:40   **D-FE02-4**

The Design and Actuator Sizing for Redundantly Actuated Omni-Directional Mobile Robot

Tae-Bum Park, Jae-Hoon Yi, Byung-Ju Yi(Hanyang Univ.), Whea-Kuk Kim(Korea Univ.) Bum-Jae Yu, Sang-Rok Oh(KIST)

Omni-directional mobile robots have been employed popularly in several application areas. However, the optimal design has not been considered yet. This paper introduces an optimal design methodology for omni-directional mobile robots. Optimal design parameters such as the offset distance and the wheel radius are identified with respect to isotropy. Furthermore, the force transmission ratio and actuator sizing problem are treated. Conclusivel, three cases are compared minimum actuation, two active caster wheel, and three active caster wheel, we claim that the redundantly actuated mobile robot with three active caster wheel has the best performance.