

TP03

Robot Vision II

13:30-15:30

Room : Base 1st Floor-Otztal

Chair1 : Kitazoe Tetsuro (Miyazaki Univ., Japan)

Chair2 :

13:30 – 13:50

TP03-1

Robust Landmark Matching for Self-localization of Robots from the Multiple Candidates

Hyun-Deok Kang, Kang-Hyun Jo(Ulsan Univ., KOREA)

This paper describes a robust landmark matching method to reduce ambiguity of candidate of landmark. General robot system acquires the candidate of landmark through vision sensor in outdoor environment. Our robot uses the omnidirectional vision system to get all around the view. Thus, the robot obtains more candidates of landmark than the conventional vision system. To obtain the candidates of landmark, robot uses the two types of feature. They are vertical edge and merged region of vertical edges. The former is to extract the vertical line of building, street lamp, etc. The latter is to reduce ambiguity of vertical edge in similar region. It is difficult to match the candidates of landmark...

13:50 – 14:10

TP03-2

stereo vision for monochromatic surface recognition based on competitive and cooperative neural network

Xijun Hua, Yibing Tang, Masahiro Yokomichi, Tetsuro Kitazoe , Michio Kono(Miyazaki Univ., JAPAN)

Abstract: The stereo correspondence of two retinal images is one of the most difficult problems in stereo vision because the reconstruction of 3-D scene is a typical visual ill-posed problem. So far there still have been many unsolved problems, one of which is to reconstruct 3-D scene for a monochromatic surface because there is no clue to make a correspondence between two retinal images. We consider this problem with two layered self-organization neural network to simulate the competitive and cooperative interaction of binocular neurons. A...

14:10 – 14:30

TP03-3

Efficient Tracking of a Moving Object Using Optimal Representative Blocks

Wan-Cheol Kim, Cheol-Ho Hwang, Su-Hyeon Choi, Jang-Myung Lee(Pusan Nat'l Univ., KOREA)

Motion estimation using Full-Search(FS) and Block-Matching Algorithm(BMA) is often used in the case of moving object tracking by vision sensors. However these methods often miss the real-time vision data because these schemes suffer the heavy computational load. When the image size of moving object is changed in an image frame according to the distance between the camera of mobile robot and the moving object, the tracking performance of a moving object may decline with these methods because of the shortage of active handling. In this paper, the variable-representative block that can reduce a lot of data computations, is defined and optimized by changing the size of representative block accur...

14:30 – 14:50

TP03-4

New Method of Visual Servoing using an Uncalibrated Camera and a Calibrated Robot

Masahiko Morita, Uchikado Shigeru(TokyoDenki Univ., JAPAN), Osa Yasuhiro(Tech. Kobe City College, japan)

In this paper we deal with visual servoing that can control a robot arm with a camera using information of images only, without estimating 3D position and rotation of the robot arm. Here it is assumed that the robot arm is calibrated and the camera is uncalibrated. Here we consider two coordinate systems, the world coordinate system and the camera coordinate one and we use a pinhole camera model as the camera one. First of all, the essential notion can be show, that is, epipolar geometry, epipole, epipolar equation, and epipolar constrain. And these plays an important role in designing visual servoing in the later chapters.

Statement of the problem is given. Provided two a priori...

14:50 – 15:10

TP03-5

Feature Extraction for Vision Based Micromanipulation

Min Soo Jang, Seok Joo Lee, Gwi Tae Park(Korea Univ., KOREA)

This paper presents a feature extraction algorithm for vision-based micromanipulation. In order to guarantee of the accurate micromanipulation, most of micromanipulation systems use vision sensor. Vision data from an optical microscope or high magnification lens have vast information, however, characteristics of micro image such as emphasized contour, texture, and noise are make it difficult to apply macro image processing algorithms to micro image.

Grasping points extraction is very important task in micromanipulation because inaccurate grasping points can cause breakdown of micro gripper or miss of micro objects. To solve those problems and extract grasping points for micromanipulation...

15:10 – 15:30

TP03-6

Communication Sequence Determination for Lead Vehicle Control in a Platoon via Remote Control Station

Jae Weon Choi, Tae Hyun Fang(Pusan Nat'l Univ., KOREA)

In this paper, we present a remote control strategy for vehicles moving in an Intelligent Vehicle Highway System(IVHS). We study a method for optimal off-line scheduling of a limited communication channel that is used for lead vehicle control in a platoon. The deviated distance from the desired trajectory is used for defining a cost functional that measures the performance of the system with communication constraints in relation to the desired system without communication constraints. The optimal communication sequence is obtained by simulations.