Human support system by Vision technology.

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(1) Background

In this laboratory, we are developing the software for human support system using computer vision technology. The purpose of research is to prevent traffic accidents with vehicle, and we would like to realize safe and secure city development.

(2) Detection method of traffic sign board

There are many cases of crews involved in accidents on the road because of missing or recognition delay of traffic sign board by drivers. To prevent these cases, we try to develop on detection of traffic sign board using a vehicle camera. Fig.1 show the example of result image to detect of traffic sign board in highway.

Fig. 1 Example of output image for detect of traffic sign board.

(3) Detection method of water pools on the road

If there is a water pools on the road at night, it will be very dangerous because the steering wheel may be removed in bicycle. We focus on the feature of reflected light, it is specular or diffuse reflection. Fig.2 show the example of detection the water pool on the road at night.

(a) Input image   (b) Output

Fig.2 Example of detection the water pool on the road.

(4) Measuring method of distance to leading vehicle

We focus on the feature of color on the taillights in vehicle and motorcycles, it is extracted by template matching and it is measuring of distance from ourselves. In addition, this system can be detected a walker of the street intersection. Fig.3 show the example of measuring distance to leading vehicle.

Fig.3 Example of measuring distance to leading vehicle.

(5) Estimation method for movement direction of vehicle in curve mirror

To detect and track a vehicle approaching an intersection, we focus on the curve mirror at an intersection. Curve mirror is extracted by approximate ellipse and movement direction of vehicle is estimated from feature of optical flow. Fig. 4 show the example of estimation result for movement direction of vehicle.
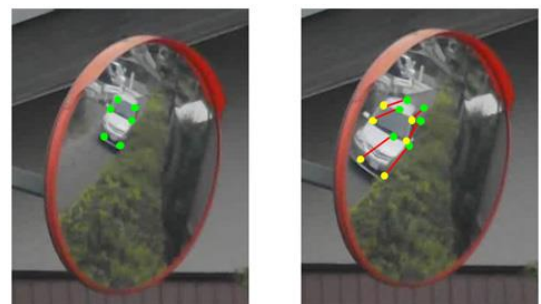
(a) frame t (b) frame $t+\triangle t$

Fig.4 Example of estimation result for movement direction of vehicle.