



Special Feature: Spatial Information Technology towards Intelligent Vehicle Systems

Overview

Yoshiko Kojima

Department Manager

System & Electronics Engineering Dept. I

Spatial information enhancement is one of the key technologies for improving the functionality of intelligent vehicle systems. At the stage of research and development, a general approach aims to improve the autonomy level and safety performance, and to enlarge the application environment by using high-performance sensors and highly accurate map. On the other hand, this approach has cost problems preventing intelligent mobility from being widely used. One solution about the problems is spatial information processing technology which improves the accuracy of the spatial information around vehicles. This technology collects information obtained by using mass-produced on-board sensors into a server on the cloud, and integrates this information.

This special feature focuses on spatial information processing and its application technologies. First, an automatic lane-level map generation method using low-cost sensors and a precise trajectory estimation method based on multi-sensor fusion are described. These methods are integral to construct highly accurate spatial information from general on-board sensors. This special feature also describes low cost image processing technology for highly accurate pedestrian recognition and compact imaging LIDAR technology.

In addition, two spatial information application technologies are proposed. First one is a virtual environment reconstruction technology based on generated spatial information. This technology can be applied to virtual assessment for intelligent vehicle systems. The another one is a layered vehicles control architecture which can realize low latency control using multiple edge servers.

These technologies described in this special feature are thought to be important for future intelligent vehicle systems.