

Shibaura Institute of Technology Advanced Driver Assistance Systems Lab



Introduction on Advanced Robot and Automotive Collaboration

Toshio Ito, Depart. Of Machinery and Control of Systems
Yutaka Hirakawa, Depart. Of Computer Science and Eng.
Kojiro Iizuka, Depart. Of Machinery and Control of Systems
Dai Watanabe, Depart. Of Machinery and Control of Systems
Toshiya Hirose, Depart. of Eng. Science and Mechanics
Nobuto Matsuhira, Depart. of Eng. Science and Mechanics

http://www.web.se.shibaura-it.ac.jp/tosi-ito/



Background – To achieve Sympathy Community

- ICT and SIT : Sympathy Community Support by Mobility and Robotics tech -





SHIBAURA INSTITUTE OF TECHNOLOGY

Automated driving Set BOX







SHIBAURA INSTITUTE OF TECHNOLOGY

SLAM – Sensor view





SHIBAURA INSTITUTE OF TECHNOLOGY

SLAM – Point cloud map



3D map example (Omiya campus)



Travel route pattern



Inside building and environment 3D map (For Toyosu verification test)



SHIBAURA INSTITUTE OF TECHNOLOGY

Traffic light recognition





SHIBAURA INSTITUTE OF TECHNOLOGY

Verification test in Toyosu





SHIBAURA INSTITUTE OF TECHNOLOGY

Other technologies

Overview of other technologies

• Prototype of the principle model of the step-over mechanism and check the operation

 Study completed on detection method of danger information outside vehicle by ultrasonic communication

·Start of joint study of SLAM map data with map manufacturers

• Exploring how to use 3D maps and traditional map information

·Completion of data collection at the Toyosu public road test site

· Development of common information map for robots and automobiles

• Study and implement methods to reflect environmental information in environmental maps





Future works

Technologies

- Health monitoring using heart beat detection by radar
- Pedestrian detection from omni-directional camera
- Mouth movement recognition from the camera
- Sensor fusion with LiDAR and omni-directional camera
- Integration by low-cost devices
- Collaboration
 - Closer cooperation with robots
 - Finding collaborate partner universities and companies
 - Demonstration on 2nd March 2021



