Advanced Mobility Research Center (ITS Center)

Y. SUDA / K. NAKANO (Dept. of Mechanical and Biofunctional Systems)
T. OISHI / S. ONO (Dept. of Informatics and Electronics)
T. OGUCHI / S. SAKAMOTO / K. SAKAI (Dept. of Human and Social Systems)

http://www.its.iis.u-tokyo.ac.jp/

Cooperative ITS
- Proposal of "Cooperative ITS" Schematic Systems for ITS services
- Next-Generation PTPS PTPS using electric waves within 700 MHz band

Advanced Safety Vehicle (ASV) Project in Hiroshima
World-first on-road FOT of ADAS between tramcar and car, driving simulations for service evaluation targeting ITS Connect (760MHz band) services.

Next-Generation Infrastructure
- Road Space Design
- Public Address System in Tunnels
  “Optical Dots” developed for safe and comfort driving, adopted by Tokyo Metropolitan Expressway
  Public address system developed for the case of emergency evacuation in long tunnels, adopted by Tokyo Metropolitan Expressway

Traffic Simulations
- Huge-scale traffic network simulator development and its application to Metropolitan three ring roads
  about 400 thousand links, 200 thousand nodes, 110 thousand kilometers length and more than 1100 zones

Virtual City Modeling
- Construct a virtual space using 3D geometric data and videos obtained by several kinds of sensing systems and digital maps
  Mobile sensing system
  Real-video-based driving simulator
  Super-resolution of on-vehicle video

Experimental vehicles, driving simulators, posters exhibited

History
- 2003.4 "Sustainable ITS", a cooperative project among academia, industry, and the government, started in CCR
- 2003.5 "Collaborative Research Center for Advanced Mobility (ITS Center)" established in IS (Director: Prof. Dr. Ikeuchi)
- 2009.4 Upgraded to "Advanced Mobility Research Center (ITS Center)" an university-authorized research center (Director: Prof. Dr. Kuwahara)
- 2014.4 "Advanced Mobility Research Center (ITS Center)" (Director: Prof. Dr. Suda)

ITS (Intelligent Transport Systems) is an advanced transport system in which various fields, such as transport engineering, vehicle engineering, information technology, are integrated.

The Advanced Mobility Research Center promotes research and development of ITS through collaboration of academia, public, and private sectors.

Research Activities

Tohoku Restoration Project
As a support for the earthquake disaster reconstruction of Tohoku region, the “Next-generation Emergencies for Tohoku Recovery (NET) Project” was initiated in 2012 to promote R&D of mobility integrated energy management system (EMS) that supports the sustainable development of a disaster resilience region.

Kashiwa ITS FOT Model City
ITS research activities launched for environment-friendly transport society in kashiwa City, which is designated as one of the ITS FOT model cities by the Cabinet Office of Japan.
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Intelligent Transport Systems

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Research Activities

Smart Tourism
- The "Smart Tourism" is a novel ITS service for tourism taking advantage of mixed-reality (MR) technologies, next-generation mobility, etc.
- We classify actions of tourists as four steps: (1) Motivation (2) Visiting (3) Impression (4) Revisit, and provide visual information services using WWW and MR system, and mobility aid service using EV and PMV.

HMI
- V2X communication-based in-vehicle information systems, e.g., in-vehicle traffic lights

Research Facilities

Universal Driving Simulator (DS)
- Six-DOF motion platform with one-DOF turntable mechanism and image generation system for 360-degree view and door mirrors adopted with a car navigation system
- Reproducing driving environment and traffic condition close to the real world
- Used for experiments about driving behavior, assessment of driving safety on a new road infrastructure, etc

Various Traffic Simulation Models (TS)
- Traffic simulators (TS) of various scales developed, and ITS technologies and policies simulated and evaluated with high accuracy
- SOUND : A network traffic simulator, covering a wide network including expressways, while vehicles are considered individually.
- AVENUE : A street-level traffic simulator, based on the detailed maneuvers of individual vehicles, such as lane changing at an intersection. Used for evaluating traffic operation strategies, reducing congestion on streets, etc.
- KAKUMO : A micro traffic simulator, connecting TS and DS. It fills the gap of spatiotemporal resolution between TS and DS by calculating driver’s behavior and vehicle dynamics of hundreds of vehicles around the test driver in DS. Simultaneously, the behavior of the test driver in DS is reflected to TS, and then the movements of surrounding vehicles and the traffic condition change interactively.

Human Resource Development and Social Return Activities

- ITS Seminar: Series of seminars organized about three times a year, and ITS based on needs from local areas as well as central administration stipulated
- Lectures: Not only lectures for students but also a special course for private sectors organized for developing human resource in ITS industry
- Research Committee: Informal discussions about latest ITS topics hosted every month inviting speakers from academia, industry, and government

Global Collaboration

ITS Center hosts an international symposium every year and exchanges faculty members and students with other universities and institutes through international collaboration as well as domestic collaboration.