Laboratory / Center profile

Mobility Systems Management Center

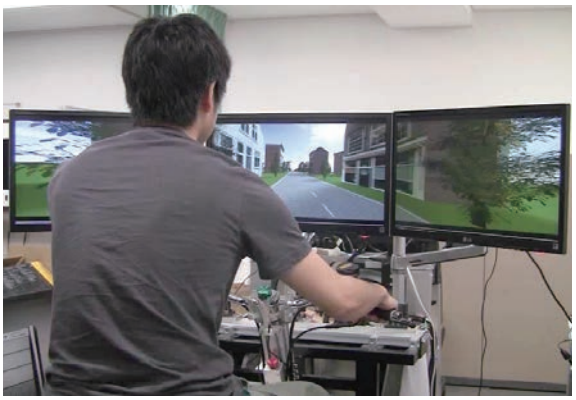
Representative: Professor Hidekazu Nishimura
Members: Mr. Yoji Suhara, Representative Director, Community Technology Institute Inc.
Professor Testuro Ogi, Project Associate Professor Noriyasu Kitamura, Project Instructor Satoko Kinoshita, Project Instructor Yun Sunkil
Research Area: safety of mobility systems, model-based systems engineering, environmental symbiosis and regional vitalization

The Mobility Systems Management Center, in collaboration with the Systems Engineering Center, conducts research on crosscutting issues that are relevant to the Symbiotic and Safety System Design Laboratory, the Universal Design Laboratory and the Model-Driven System Development Laboratory. The Mobility Systems Management Center explores solutions to various issues embedded in space-related and public transportation such as train and bus, automobiles, motorbikes, personal mobility, bicycles, pedestrians and wheelchairs, as well as their relationships with localities.

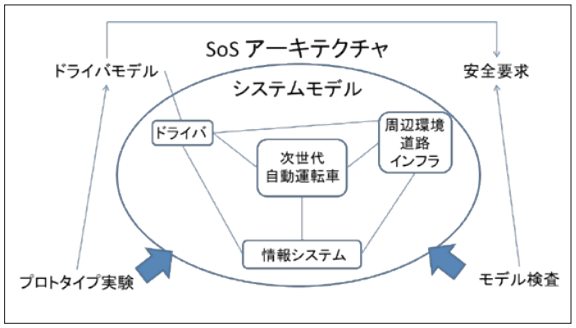
Mobility is extremely important for regional vitalization, as it provides multi-dimensional support to residents in a certain locality. Essential infrastructures supporting the mobility of a locality include public transportation, individually-owned vehicles, car sharing, personal mobility devices, including bicycles and motorbikes, interconnections with paratransit services, as well as associated road development and barrier-free promotion. The center plans to explore the links between biohydrogen and mobility as part of its smart city plan project for Miyako city in the Iwate Prefecture in the future.

A series of basic experiments have been conducted in order to explore the ways in which the elderly can maintain or improve their safe driving skills as a part of joint research with Tokio Marine & Nichido Risk Consulting Co., Ltd. In addition, as part of a project proposed by JKA (an automobile race) titled “RING! RING! (2011-13)”, we developed motorbike simulators while exploring various ways in which stabilizing motorbike riding can be assisted.

Furthermore, as part of the Information-Technology Promotion Agency (IPA)’s assistance for leading research in software engineering 2014, we began our two-year research and development in relation to complex system of systems such as next-generation automobiles and transportation systems, titled “Architecture Design of System of Systems for the Next-Generation Driver-less Automobiles with System Model and Repeated Model Checking”. Since it is expected that driver-less automobiles will become more common in future transportation systems, we plan to pursue the architecture necessary for ensuring the safety of such systems.



Experiment for a motorbike simulator.



Concept illustration of an approach toward establishing SoS architecture for next-generation automobiles.

Engineering Systems: Meeting Human Needs in a Complex Technological World

The translation version of *Engineering Systems: Meeting Human Needs in a Complex Technological World* was published by Keio University Press Inc. in February 2014. The original authors are Professor Olivier L. de Weck, Professor Daniel Roos and Professor Christopher L. Magee of MIT. The text was translated by Professor Shinichiro Haruyama (editor), Associate Professor Naohiko Kohtake, Associate Professor Seiko Shirasaka and Ms. Junko Tomita. One of the authors, Professor Olivier L. de Weck of MIT, has been giving lectures at Keio SDM since its foundation in 2008; descriptions of some of these lectures have been included in the book. This book features information on engineering systems, an emerging academic discipline. It explains that engineering systems do not consider engineering-related issues merely as technological problems. Rather, it promotes the idea that engineering should meet human needs by capturing issues more broadly, including social, economic and technical requirements. This approach is in line with Keio SDM’s principle of “see the wood and the trees”. The original work was published by MIT Press as part of the *Engineering Systems*. The Japanese translation of the book is the first title in the *Engineering Systems Series*, published by Keio University Press Inc. More books from MIT Press’ *Engineering Systems* series will be translated into Japanese and published in the future.

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SDM System Design and Management