Title of Project : Research on Information Infrastructure Platform for Sustainable Smart Mobility

Akira Fukuda
(Kyushu University, Faculty of Information Science and Electrical Engineering, Professor)

【Research Aim and Background】

Research on smart mobility has started to change its focus to new domains, not only on transport systems. Although approaches from information science have been applied, most approaches conduct R&D on separated techniques such as sensing, acquisition and visualization of automobile probe data etc. There is a lack of systematic/foundational research on design, development, and construction of an info infrastructure platform for smart mobility. The current smart mobility society has evidenced new progress about emergence/utilization of novel sensing techniques or services focusing on ITS, and further development can be anticipated. A dynamic architecture which can embrace these factors becomes important. Discover malfunctions in the operation phase after system's construction, and feed-back the discovered malfunctions to design phase. A feedback mechanism based on this process
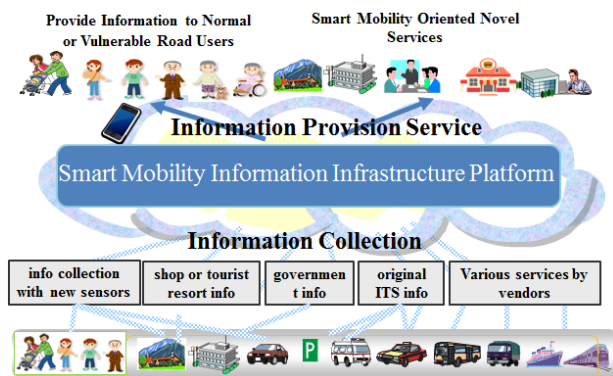

Figure 1. Smart Mobility Info Infrastructure Platform

or experience/knowledge obtained in this process is indispensable. Establishing such a mechanism enables construction of sustainable systems. This research investigates architecture for design, development, and construction techniques of an info infrastructure platform, targeting on smart mobility and is life-cycle oriented, i.e., covering all phases until system's deployment and operation.

【Research Methods】

Unlike most previous research which stops at a close cycle of system design, development, and construction, the most significant feature of this research is to establish 1) systematic techniques that can actualize problems discovered during system's operation and feedback them flexibly for platform's redesign/reconstruction; 2) sustainable smart mobility info infrastructure platform. In particular, through extending previous research achievements, this research is to establish 1) architecture of life-cycle oriented smart mobility systems, 2) feedback technologies from system's operation to design, 3) reliable design/verification techniques. ITS is a central target field now, but smart energy will also be considered in the future.

The research aims at practical results, and thus, industrial cooperation is indispensable. To this end, the research plans to establish close cooperation with ITS and smart energy communities.

【Expected Research Achievements and Scientific Significance】

Smart mobility society is to become important in the future. In such a society, through operation, we are able to construct sustainable and improvable systems, and to stabilize social infrastructure. Also, through exporting the accomplished infrastructure platform to developing countries as a social infrastructure, industrial competitiveness of our country can be strengthened.

【Publications Relevant to the Project】

・W.Kong, L.Liu, T.Ando, H.Yatsu, K.Hisazumi, and A.Fukuda : Facilitating Multicore Bounded Model Checking with Stateless Explicit-State Exploration, The Computer Journal, 2014.
・T. Ando, H.Yatsu, W.Kong, K.Hisazumi, and A. Fukuda : Translation Rules of SysML State Machine Diagrams into CSP# toward Formal Model Checking, Int. J. of Web Information System 2014.

【Term of Project】 FY2015-2019

【Budget Allocation】 153,600 Thousand Yen

【Homepage Address and Contact Information】
https://www.f.ait.kyushu-u.ac.jp/projects/KakenKibanS