KEYWORDS 3D virtual environment technology/3D Traffic Simulator/gamification

Technology for Creating Effective Intelligent Transport Systems (ITS) based on Big Data and the 3D Internet

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background / purpose (研究背景・目的)

To mitigate traffic congestion and CO_2 emission in megacities, the implementation of effective ITS strategies is one important approach. Accordingly, the purpose of our research is two-fold. First, we develop a 3D Traffic Simulator that supports the accurate prediction of (a) the traffic situation and (b) the effect of applying some ITS strategy. Such predictions will greatly benefit from Big Data about the current traffic situation. Second, we develop a crowdsourcing technique to accurately estimate the effect of new ITS strategies on human driving behavior. Based on these two methods, we expect a major contribution to the design and testing of future green megacities.

the contents of the research (研究内容(技術の特徴))

The core development is a massively multiuser networked 3D virtual environment technology (the "3D Internet"), which enables the synchronization of 100s of Traffic Simulator controlled cars with 100s of user-controlled cars in a shared 3D simulation space. Our core techniques are: (1) an intelligent authoring tool to test the effect of new ITS strategies with scientific rigor; (2) a 3D Traffic Simulator based on multi-agent systems (MAS) technology; and (3) an incentive scheme for crowdsourcing large-scale human driving behavior data, based on Distributed Constraint Optimization and "gamification" elements.

possibility of the application to industry (産業応用の可能性)

(1) Traffic Information Service for Drivers: highly accurate prediction of traffic based on microscopic traffic simulation in realistic 3D environment (and Big Data)
(2) Planning Service for Government: highly accurate estimation of the effect of new ITS strategies on human driving and travel behavior in a city
(3) Online Insurance Companies and Driving Schools: highly accessible online eco-driving training tool for practice and testing of eco-driving skill(Facebook, iPad, iPhone, Android)

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