Summary of SIP-ADUS project (FY2015)

Name of the project	Development and substantiation of simulation technology for estimation of traffic accident reduction detailed effects. (Strategic Innovation Promotion Program: Automated driving system)
Responsible Organization	Japan Automobile Research Institute

Name	Akito Adachi	Hiroyuki Ota

Object of the Project

In order to achieve the safest automobile transportation society in the world, early practical use and promotion of the automated driving system have been expected. In this project, the simulation technology of the traffic environment reproduction to figure out the quantitative effect of traffic accidents reduction thanks to automated driving system is developed and contributes to the achievement of the above target.

Project Summary

In this year, the common base of detailed-effect estimation simulator of the traffic accident reduction, the functions of collision warning system and Autonomous Emergency Brake in the situation of following the preceding vehicle and rear-end collision at the straight single-lane were developed and performed. Capability of the simulation to estimate the quantitative accident reduction effect was confirmed.

(1) Development of simulation technology
   - Summarized the overall plan for four years on the simulation technology development, and clarified the development items in each year.
   - Developed a driver model module which emulate human information processing (perception/recognition, judgment and operation) and confirmed the function of reproducing a recognition error (inattentive) and operational error that represent various characteristics of drivers.
   - Established the driver behavior model to follow the preceding vehicle on a straight single-lane road, and confirmed the change of the driver behavior in accordance with the distance and the relative speed to the preceding vehicle.

(2) Functional evaluation of simulation in the situation of following and collision with the preceding vehicle
   - Conducted simulations using the real accident data collected from the driving recorder and reproduced risky situation by adding the accident causes (inattentive).
   - Confirmed the capability to estimate the quantitative effects of accident reduction such as collision speed reduction by the collision warning system and Autonomous Emergency Brake.

(3) Plans on the validation of the accident reduction effect
   - Defined the five necessary steps to verify the validity of the simulation results scheduled for the next fiscal year.

Future plan

- In order that the simulation will be used by automobile manufacturers in the future, the adaptation of interfaces has to be promoted so that models of each manufacturer can be easily incorporated.
- The formulation of very accurate model with the enhancement of experiment trials using the instrumented vehicle or the driving simulator are necessary to formulate very accurate driver model including reproduction of the drowsiness situation, which is not easy among the driver models.