Summary of SIP-adus Project (FY2016)

Name of the project	Research and Development Project for Automobile Security for Utilization of Information Obtained by Communication such as V2X
Responsible Organization	Japan Automobile Research Institute

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Object of the Project

Utilization of communication such as V2X is expected for Automated Driving to obtain information like dynamic map and surrounding situation. Meanwhile, the connection to external world through the wireless/wired communication makes Cybersecurity an important issue. So, requirement for Automotive Security will be specified by building common model of Automated Driving System followed by executing threat analysis And study validation/evaluation technologies, methods, and criteria for component level to vehicle level, then specify the requirements for test beds. In addition, the methods of omitting certificate vilification of V2X communication is studied.

Project Summary

The research/development project of Automotive Security was done with the following three themes ;

1) Investigation on threat analysis, security requirements and countermeasure technologies
The specification of tools and database format for building the common platform of threat analysis ware investigated and specified. The tools are expected to improve the efficiency of executing threat analysis.

2) Study on the evaluation / validation technologies of counter measures against attacks to vehicle
From the component level to the vehicle level, security evaluation / verification technologies were investigated. And at each levels, evaluation environments were built and attack evaluations were done by using such environments. And also some attacks were reproduced by simulation. At the component level, attacks to the reprogramming procedure were attempted. At the in-vehicle network level, attacks to the key encryption and distribution process were done. Also, some attack case were reproduced on the simulator which is based on the communication protocols and effectiveness of the simulator was shown. At the in-vehicle system level, testbed of simplified vehicle model was studied and base of the testbed including central gateway was built. And evaluation method for "behavior detection," which is one of intrusion detection technology, was studied. .

3) Study on the verification omission methods for V2X communication
Prioritized message verification method, which was proposed at the last year's study, was evaluated by simulation, and the simulation results show the target performance was achieved by utilizing the proposed method.

Future plan

1) To develop the tools in the common platform with refining the specification to be more user-friendly.

2) To improve the testbed and to study of wider use of the testbed. And to study approaches for improvement of evaluation / verification skills.

3) To evaluate the performance by using the actual V2X on-board devices, and to consider standardizing.