講演番号 182

文献番号 20226182

Study on Traffic Accidents to Promote Popularization and Advancement of Automatic Accident Emergency Call System

Hideki Hayashi [1)] Ayumi Shinohara [1)] Toru Kiuchi [2)] Hirotoshi Ishikawa [3)]

1) Ministry of Land, Infrastructure, Transport and Tourism
2-1-3 Kasumigaseki, Chiyoda, Tokyo, 100-8918, Japan
2)Institute for Traffic Accident Research and Data Analysis
2-7-8 Sarugakucho, Chiyoda, Tokyo, 101-0064, Japan
3)Emergency Medical Network of Helicopter and Hospital
25 Ichibancho, Chiyoda, Tokyo, 102-0082, Japan

KEY WORDS: **safety, automatic collision notification, injury prediction [C1]**

The number of fatalities and injuries from traffic accidents has been steadily declining. However many victims are still occurring. The number of fatalities within 24 hours amounted to2,636 in 2021. In light of this situation, the 11th Traffic Safety Basic Plan formulated in March last year set a target of reducing the number of fatalities within 24 hours to less than 2,000 and the number of serious injuries to less than 22,000 by 2025, aiming to realize the world's safest road traffic.

To achieve these goals, there are high expectations for"Automatic Collision Notification(ACN)". This system automatically sends information such as current location to the operation center in the event of a high-impact accident that causes the airbags to deploy, and links the system to the fire department and police for prompt lifesaving operations. And recently advanced type of the system "Advanced Automatic Collision Notification(AACN)"that estimates the probability of fatality and serious injury of front seat passengers has been developed and widespread.

This research study was started in 2021 with the aim of constructing shared database to evaluate the algorithms used to estimate the probability of fatality and serious injury, and to clarify issues related to systems and operations of AACN.

An outline of the study is given below. The target data was selected from "D-Call Net" that is the only emergency call service currently in practical use in Japan. The number of accident information collected from D-call Net was 200 in 2021. Of these, 21cases were investigated after obtaining consent from the victims involved in the accident.

Two characteristic examples are given.

CASE A:

The driver was traveling about 120 km/h when he was thinking about something then became careless in front, and collided head-on with a junction dividing strip.

The system predicted a 100% probability of fatality and injury for the driver, but the driver was actually uninjured.

The reason for this is thought to be that the collision object efficiently absorbed the energy of the vehicle, the cabin deformation was small, the restraint system functioned, and the driver was a 24-year-old male.

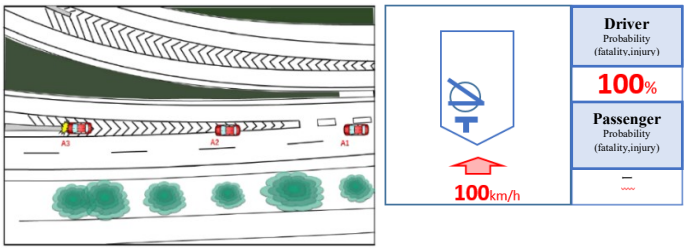

Fig.1 Accident Situation and Injury Probability in CASE A

CASE B:

In this case the accident occurred in the intersection by the driver's neglection of Stop sign warning resulted overturn to the sideway. It was evaluated 59% serious injuried by the system witch was close to the real casualty.

Through proper notification of the D-call Net, Docter helicopter departed toward accident cite. However it took 25 minutes to take this action.

This example implies prompt system activation was not well-linked to real action.

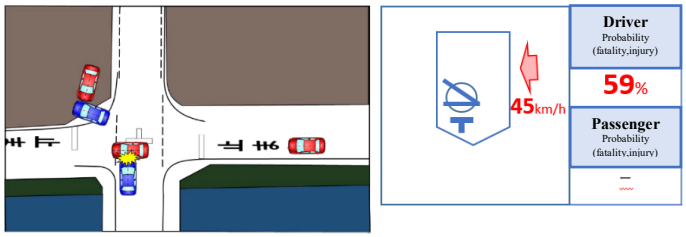

Fig.2 Accident Situation and Injury Probability in CASE B

As you may see CASE A, AACN need to improve further the accuracy of the probability of fatality and serious injury. Although the current estimation algorithm allows overtriage in one out of every two cases, improving the accuracy of the algorithm will lead to the provision of rapid life-saving activities in the future.

CASE B shows a need of more information provided by hospitals. At present, only a few hospitals do event records such as helicopter request time, takeoff time, arrival time at the scene, departure time from the scene, arrival time at the hospital, etc.

It is necessary to continue this research because accumulating and sharing more accident data will lead to the advancement of the AACN and the development of other advanced safety vehicle technologies.