CAN A REGULAR SMARTPHONE BE USED AS AN AUTOMATIC CRASH NOTIFICATION SYSTEM FOR VULNERABLE ROAD USERS?

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Automatic Crash Notification

This study

Today’s smartphones are equipped with high quality movement sensors (accelerometers, gyroscopes, magnetometers), GPS and SMS functionality. This opens up for a smartphone-based ACN system for vulnerable road users (fig. 2).

Use case scenarios

In order to reduce the effects of a traffic accident it is essential to transport the casualties to the right care facility with minimal delay. For (single) accidents involving Vulnerable Road Users (VRUs) it is often a problem to know about and report the accident and its location swiftly, and thereby the rescue gets delayed. EU’s eCall regulation (fig. 1) requires future cars (from 2018) to be equipped with Automatic Crash Notification (ACN), which notifies 112 with the vehicle’s exact location (GPS) in case of a crash.

The aim of this study was to explore the feasibility to develop an ACN system for VRUs based on regular smartphones.

Results

We have focused on bicyclists, horse-back riders, and ATV (All Terrain Vehicle) users*, i.e. three different VRU categories frequently involved in single accidents who could benefit from an ACN system. By combining simplified crash tests/simulations with large volumes of smartphone -recorded body movement data from normal bicycling, horse-back riding and ATV use, we have developed algorithms that can discriminate between normal activities and incidents, i.e. activities which are recognized as non-normal and should be reported as a potential accident.

Conclusion

This work demonstrates the feasibility of smartphone-based ACN systems for Vulnerable Road Users.

(*) The financial support from Länsförsäkringsbolagens forskningsfond to the ATV-related part of the study is gratefully acknowledged.