Technische Universität München

News Release

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Green light for the largest fleet test for car-to-X communication worldwide

Intelligent cars alert each other to hazards

The largest field test for vehicle-to-vehicle and vehicle-to-infrastructure communication (car-to-X communication) worldwide is about to get under way. Scientists, auto makers and communication companies as well as public-sector institutions have teamed up to develop a system that allows cars to share information on traffic conditions and impending hazards. The aim is to promote a safer, more efficient flow of traffic. Researchers from the Technische Universität München (TUM) are currently involved in devising the test scenarios that 120 vehicles will use to put the system dubbed sim^{TD} through its paces on Germany's roads next spring.

Notice traffic blocks before they are visible. Recognize risky situations before they get out of hand. Reach your destination on time, safe and relaxed. The “Safe and Intelligent Mobility – Test Field Germany (sim^{TD})” research project is pursuing these aims. The idea is to electronically network vehicles and infrastructure by means of car-to-X communication. A fleet of 120 vehicles fitted with the system developed by the sim^{TD} consortium is about to demonstrate how this works in practice on the highways, rural and urban roads in and to the north of Frankfurt am Main over several months. “Over the past few years a multitude of car-to-X technologies have been developed. The common standard should now allow us to investigate how drivers adopt this technology in everyday scenarios and to what extent we can improve road safety, prevent congestion and reduce CO_2 emissions,” as Prof. Fritz Busch, TUM Chair for Traffic Engineering and Control outlines.

The sim^{TD}–System is using wireless technology that was specifically developed for this automotive field of application. The technology is based on the well-known WLAN standard. Information can either be transferred directly to other vehicles or to Roadside Stations installed along the road. If the communication partner is not located in close vicinity to the sender, other vehicles can transmit or store and forward information.

The vehicles transmit information on the traffic conditions to the control station, which can then predict and manage traffic developments. A display provides drivers with recommendations on the best route. The system also assists drivers at intersections or traffic lights by providing a timely display of the right lane for the next turn, or the optimum speed to ride a “wave of green traffic lights.”

The system also alerts drivers to imminent hazards. An emergency braking lamp in the display, for instance, warns the driver if a vehicle ahead brakes heavily – well before the driver is physically able to react to the situation. Where rescue services are responding to an incident, the system shows the direction and the lane taken by the emergency vehicles, enabling the driver to know precisely where they are. If obstacles, such as lost cargo, are blocking the road, drivers receive timely advice on alternative routes.

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What kind of formations, at what times, and which routes do the individual vehicles in the test fleet have to take to produce reliable results? Scientists from the TU München are looking at all these questions. Their remit is to prepare the field test and subsequently to analyze the huge amounts of data produced. Together with the University of Würzburg, they also run the sim^{TD} simulation laboratory. Here, the traffic engineers from the TUM simulate what impact the introduction of the technology would have on the entire traffic in the test area if a certain proportion of cars were fitted with this technology. The Würzburg-based traffic psychologists are using a driving simulator to investigate driver behavior particularly where safety concerns prevent certain scenarios from being tested on the road.

The Federal Ministry of Economics and Technology (BMWi), the Federal Ministry of Education and Research (BMBF) and the Federal Ministry of Transport, Building and Urban Development (BMVBS) provide funding for sim^{TD}, because this consortium has the potential to promote a new dimension of foresighted driving, traffic control, and accident avoidance. The ministries are convinced that a commonly agreed standard is essential for the commercial deployment of this pace-setting technology. “With the sim^{TD}-system, we are presenting a trend-setting technology that will allow vehicles from leading German manufacturers to network with one another and with the traffic infrastructure,” explains project coordinator Dr. Christian Weiss.“Car-to-X communication will make driving safer, more convenient and more efficient. The results of the sim^{TD} project represent an important component for the mobility of the future.”

sim^{TD} is a joint project initiated by leading German automakers, automotive suppliers, communication companies and research institutes, together with assistance from the public sector. Project partners are as follows: Adam Opel AG, AUDI AG, BMW AG, BMW Forschung und Technik GmbH, Daimler AG, Ford Forschungszentrum Aachen GmbH, Volkswagen AG, Robert Bosch GmbH, Continental, Deutsche Telekom AG, Fraunhofer- Gesellschaft zur Förderung der angewandten Forschung e.V., Deutsches Forschungszentrum für Künstliche Intelligenz GmbH (DFKI), Technische Universität Berlin, Technische Universität München, Hochschule für Technik und Wirtschaft des Saarlandes, Universität Würzburg, Hessisches Landesamt für Straßen- und Verkehrswesen, Stadt Frankfurt am Main. The project is also promoted and supported by the federal state of Hesse, the German Association of the Automotive Industry and the Car 2 Car Communication Consortium. BMWi, BMBF and BMVBS support sim^{TD} with approximately 40 million euros; the other project partners contribute approximately 31 million euros.

More information:
www.simTD.de

Photos:
http://mediatum.ub.tum.de/?id=1084087

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