

Press release



Source:

https://www.boschmediaservice.hu/en/press_release/with-automated-driving-focus-is-on-the-driver-95.html

10/14/2016

ID: 95

With automated driving, focus is on the driver

How Bosch is reinterpreting safe driving

- Bosch member of the board of management Hoheisel: "Automated self-driving cars will no longer be just another everyday object."
- Modern HMI and vehicle connectivity create an entirely new driving experience
- One in ten accidents in Germany are caused by distracted drivers
- Vehicle-to-vehicle communication: Bosch's test vehicle communicates with a motorcycle

Melbourne/Stuttgart – Just a few years from now, driving will change beyond all recognition. Starting in the next decade, Bosch will introduce a new system to the market that will enable cars to drive themselves on freeways or expressways. This will not only increase road safety, but more importantly, it will also open up new options for the driver. "Automated self-driving cars will no longer be just another everyday object; they will become our personal companions," says Dr. Dirk Hoheisel, member of the board of management at Robert Bosch GmbH. At the ITS World Congress developer conference, took place from October 10-14, 2016 in Melbourne, Australia, Bosch will be using a test vehicle to show what this future relationship between car and driver might look like. The key building block is a modern human machine interface (HMI) for operating the vehicle. In the future, the HMI and the car's web connectivity will together facilitate a new driving experience.

Interior camera keeps an eye on the driver

Soon, checking and adjusting mirrors, seats, and driver settings upon getting into the car will be a thing of the past. Via a newly developed interior camera, Bosch's test vehicle recognizes its drivers, then promptly loads the appropriate user profile with the preferred vehicle configuration as well as their most frequent destinations. All drivers need to do is select the destination and the calculated

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route. Then, they immediately receive information about which stretches of the route must be driven manually and which ones are suitable for letting them sit back and relax. "On the freeway, the car becomes the chauffeur and the driver a passenger," Hoheisel says. The vehicle will take over complete responsibility for all driving tasks, allowing drivers to focus on other things, such as resting, relaxing, reading e-mails, or writing – without any risk to safety. To ensure that drivers do not fall asleep during automated driving and can therefore safely retake control at any time, the interior camera continuously monitors the drivers' eye movements. If their eyes remain closed for too long, a warning sounds.

Many traffic accidents caused by distraction

In Germany, one in ten traffic accidents is caused by distracted drivers. According to a recent survey conducted by Bitkom, Germany's digital association, 42 percent of those surveyed drive and make calls with their phone held to their ear. As many as 44 percent admit to reading and 23 percent admit to actually texting while driving; 25 percent say they read e-mails while driving. By itself, the act of telephoning while driving raises the risk of an accident by a factor of two to five. A driver who glances at a smartphone for only three seconds while travelling at a speed of 120 kilometers per hour is actually driving blind for 100 meters. This demonstrates how much scope there is for automated driving to increase safety. A self-driving car cannot be distracted by a text message. With a 360-degree view, its sensors constantly monitor the traffic situation.

In Bosch's test vehicle, the HMI informs the driver when a stretch of the road is available for automated driving. Using the highly accurate HD map from Bosch's partner, TomTom, the vehicle always knows where it is on the road. The car compares its sensor data in real time with information stored in the HD map, for instance regarding road markings and crash barriers. To hand over driving tasks to the vehicle, the driver must press two buttons on the steering wheel simultaneously for several seconds. Then, on the central display, the road on the HD map turns blue when automated driving mode is activated. The display also shows the driver everything that the vehicle's environment sensors can see, as well as how much time remains before the driver must once again take over the wheel.

Take your hands off the wheel and check the refrigerator instead

During automated driving, drivers can access more infotainment functions via the test vehicle's central display than are normally available when the driver is in control. Thanks to a web connection, drivers can now browse through upcoming appointments or plan their shopping. Bosch's SmartHome app enables them to take a peek in their refrigerators at home: Are there enough drinks and provisions for the barbecue they are planning with friends or should they stop at the store? Meanwhile, the road displayed on the navigation map has turned from blue to orange, which means the automated driving stretch will end in five kilometers. The driver must prepare to take control of the wheel again. If the driver does not

respond, a warning signal sounds. This turns into a permanent warning signal with visual warning signals well before the end of the automated driving stretch. By simultaneously pressing the steering wheel buttons again, drivers can once more take control of the vehicle.

Test vehicle and motorcycle communicate with each other

Even in manual driving mode, Bosch's test vehicle increases road safety. All of the sensors and traffic information systems used during automated driving remain active. Thanks to vehicle-to-vehicle communication, Bosch's test vehicle knows about other road users long before they are in view. Motorcyclists are particularly easy to overlook in traffic because they can be visually blocked by trucks or buses. At the ITS, Bosch showcased a prototype communications connection between its test vehicle and a motorcycle. By letting both vehicles permanently transmit their location to each other, this reduces the risk of collision. Yet another example of how the technology in automated self-driving vehicles can help prevent accidents.

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Basic information:

Mobility Solutions is the largest Bosch Group business sector. In 2015, its sales came to 41.7 billion euros, or 59 percent of total group sales. This makes the Bosch Group one of the leading automotive suppliers. The Mobility Solutions business sector combines the group's expertise in three mobility domains – automation, electrification, and connectivity – and offers its customers integrated mobility solutions. Its main areas of activity are injection technology and powertrain peripherals for internal-combustion engines, diverse solutions for powertrain electrification, vehicle safety systems, driver-assistance and automated functions, technology for user-friendly infotainment as well as vehicle-to-vehicle and vehicle-to-infrastructure communication, repair-shop concepts, and technology and services for the automotive aftermarket. Bosch is synonymous with important automotive innovations, such as electronic engine management, the ESP anti-skid system, and common-rail diesel technology.

The Bosch Group is a leading global supplier of technology and services. It employs roughly 375,000 associates worldwide (as of December 31, 2015). The company generated sales of 70.6 billion euros in 2015. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology.

The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiaries and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing and sales network covers some 150 countries. The basis for the company's future growth is its innovative strength. Bosch employs 55,800 associates in research and development at 118 locations across the globe. The Bosch Group's strategic objective is to deliver innovations for a connected life. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life."

Additional information is available online at www.bosch.hu