CAN Newsletter Online

Conference: Electronic systems for motor vehicles

The 16th international congress on electronics in cars organized by the VDI (German association of engineers) took place in Baden-Baden (Germany). About 1400 attendees listened to presentations at the two-days event. They also visited the stands of 120 exhibitors.

"THE CAR CAN'T LOOK AROUND THE CORNER AND CAN'T LOOK OVER THE HILL", explained Christian Senger from Continental in his presentation about highly automated driving. That is why we need to get this information from other vehicles: Directly by means of car-to-car communication, and indirectly by car-to-infrastructure links. This crowdsourcing of data is based on sensor fusion in the vehicles. The results are sent to the cloud or to the neighbor car.

Of course all presentations about automated driving addressed different technical challenges, but all of them were optimistic about achieving highly automated driving within the next 15 years. In addition to "watching" sensors like radars and cameras, which require high bandwidths, there are also sensing elements connected to CAN-based in-vehicle networks. Wheel speed, ambient temperature and many other data are and will be collected within CAN networks. They are merged with other information and then routed to other vehicles or to the infrastructure.

"Highly automated driving will contribute significantly to coming one step closer to accident-free driving," stated Dr. Christoph Grote from BMW. Christian Senger expects a gradual process going from partial to high and then to fully automated cars: "The final stage will make it possible to drive on the motorway at speeds of 130 km/h." He believes this will happen around 2025. In his presentation, he talked about the required sensors and backend data processing. "The car is part of the Internet of things," he said. All speakers stressed the need for a closer cooperation between OEMs and suppliers as well as between the carmakers in particular for the development of the backend collecting all measured data.

Harald Altinger and Florian Schuller (Audi Electronics Venture) reported about things that are already possible. They explained the automatic parking system by Audi in Ingolstadt. Of course BMW, Volvo, and others had demonstrated the technical possibility to park a car without a driver in a parking garage, too. But Audi used an off-the-shelf car equipped with just a few additional sensors. Piloted parking, as they called it, does not require expensive equipment in the parking garage. The utilized wireless communication between car and infrastructure showed a reproducible parking accuracy, which allows smaller parking slots – a benefit for operators. Piloted parking is also very convenient for those drivers, who don't like to search for an empty lot, which can be very narrow, when SUVs are parking on both sides.

The trend to megacities with limited parking options will make car sharing even more attractive. That is why BMW and other OEMs want to personalize vehicles: As with mobile phones, the user can configure a car to their personal taste, provide this information to the cloud, and when the user enters the car, it adjusts the seats as well as other things and provides their favorite music. Dr. Dirk Serries showed a promotion video on this topic during his presentation. One of the hurdles on the way to massive car sharing is the problem of who should be held responsible for damages or even minor scratches or dents. Hauke Bäumgärtel (Hella) summarized the results of the KESS research project in his presentation. A CAN network with dedicated sensor was used to detect damages to the vehicle's body. The sensors measure the structure-borne sound and detect changes when the car is damaged. Eleven sensors were mounted on the inside of the Ford Fiesta and linked via a CAN network.

Of course, many papers were related to e-mobility and it was quite an impressive demonstration, as about 80 e-vehicles caused a traffic jam in Baden-Baden. There were voices that reminded that a "green" jam is still a traffic jam. Others said that e-vehicles are not by definition CO_2 neutral depending on how the electrical energy is generated.

During the coffee and lunch breaks and the Night of Electronics in the evening, there were also discussions about CAN FD. Microchip is going to implement CAN FD and will provide a stand-alone controller based on Kvaser's IP core. Spansion (formerly Fujitsu Semiconductors) and Renesas are developing micro-controllers with on-chip CAN FD modules. In the next year, Spansion will provide an MCU with four CAN FD interfaces. Most of the toolmakers are already committed to support CAN FD, e.g. Vector demonstrated prototype interfaces compliant with the new CAN protocol. More technical information about CAN FD and its usage will be presented during the 14th iCC in Paris (France), which is organized by CiA.