

# The car 'learns' to see and understand

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Siemens VDO Automotive presents an ergonomic network of driver assistance systems at the 61st IAA Motor Show in Frankfurt, Germany. As the volume of traffic on the road increases, will help assist drivers by warning them of potential hazards with such systems as Night Vision, a lane-changing assistant or by making routine operations, such as parking, easier.

Siemens VDO's key focus is the interaction between the driver and the system. After all, it is the interface between human and machine that will ultimately decide if future assistance systems are accepted by drivers and can work to help prevent accidents.

The United States National Highway Traffic Safety Administration (NHTSA) studies have contributed to the growing importance of driver assistance systems because they have demonstrated the use of vehicle dynamics control systems can significantly reduce the number of car accidents not involving other participants in road traffic. The growing demand for comfort and the increasing average age of motorists also are factors behind the development of driver assistance systems. The aid of electronic assistants make it possible to compensate for minor physical handicaps, so disabled or elderly persons may enjoy individual mobility. Moreover, the system can help assist any driver who can make the odd mistake now and again.

Siemens VDO's system pro.pilot keeps a watchful eye on the traffic in front, on the side and to the rear of the vehicle, constantly ensuring the driver is adequately warned of any potential hazards before an accident occurs. For instance, the lane-changing assistant, which monitors traffic approaching from behind or in the driver's blind spot, will warn the driver if they are about to make a potentially unsafe change lanes or turn. The same radar sensors also provide information for a safe door-opening function, warning the driver of any cyclists, people on rollerblades or vehicles approaching from behind before opening the door.

The lane-tracking assistant uses a CMOS (Complementary Metal Oxide Semiconductor) camera with unique software that detects when the car is about to unintentionally leave its lane, and warn the driver with a noticeable vibrating sensation in the steering wheel. The traffic-sign surveillance system, also camera-based, will initially evaluate speed information to warn drivers if they are traveling too fast.

Siemens VDO uses a lidar sensor for the adaptive cruise control system, which measures the distance from the driver's vehicle to the vehicle in front of them. Because of its low cost and effective technology, the lidar sensor is the key to widespread use of this driver assistance function across all classes of vehicles.

The new network of driver assistance systems helps driver's see better in the dark with two alternative night vision systems. The near-vision system transmits and picks up infrared light that registers objects up to 150 meters away, while the long-distance vision system registers objects several hundred meters. In the long-distance night vision Siemens VDO uses a thermal imaging camera. The digital image can be displayed on a center-stack screen or head-up display.

The new systems helps drivers even when they get to their destination with the Park Mate function. Using ultrasonic sensors, Park Mate searches the side of the road for a suitable parking. When one has been found, it will automatically take over the steering if the driver chooses to engage the system. Then, all the driver is required to do is to depress the accelerator pedal and brake according to the instructions given by the system.

Integrating the appropriate systems also produces additional benefits. For instance, the navigation system, in combination with the lane-changing assistant, can more precisely guide the driver. Knowing the lane in which the vehicle is driving on the motorway enables the system to recommend changing lanes at an appropriate time if the driver

needs to turn off at the next exit. Another advantage of Siemens VDO's integrative approach is the sensors can be used for multiple applications. The principle is that the assistance network only assists the driver because the driver can always override the electronic directions and measures.

Siemens VDO's presentation also focuses on the results and operation of the individual systems, because they need to be as easy to operate as possible. Therefore, engineers have developed a concept that combines maximum user friendliness with minimum driver strain. The display elements, for instance, are positioned where the driver instinctively expects them to be – in the instrument cluster, on the central dashboard or on the head-up display in the driver's direct field of vision. At the same time, intelligent function management determines what information is communicated on which display element. Generally, Siemens VDO assigns top-priority messages to the head-up display and less important data to the instrument cluster or to the screen installed on the central dashboard. This data management is a dynamic process and is always oriented to the given driving situation. After all, only drivers who are optimally informed can make the right decisions and increase safety on the road.

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