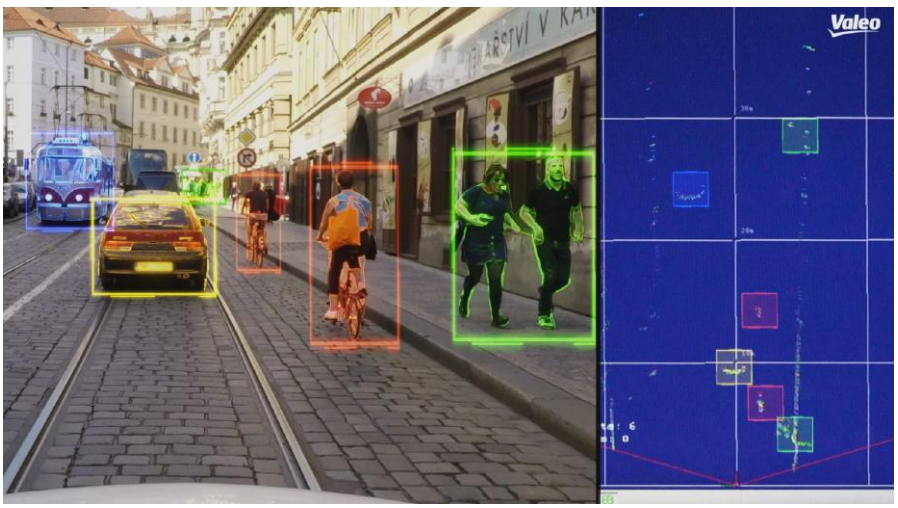
# Autonomous vehicle driving of new Audi A8

## NTN-SNR sensor at the heart of Valeo lidar devices

NTN-SNR has perfected the high-resolution angle sensor, a key part of Valeo's SCALA (trade name) lidar now fitted as standard in the Audi A8. For the first time, a vehicle will feature the functions of a level-3 “eyes off” autonomous vehicle driving under 60 km/h on a two-lane road separated by a central reservation. The sensor stems directly from NTN-SNR's know-how in this respect since the ASB®, an international standard launched in 1997. Valeo's SCALA is the first lidar offering such performance that can be mass-produced at a competitive cost.

“Eyes off” system allows the driver to release pedals and steering wheel, watch a video or write an SMS during the journey. They must however be ready to take control of the vehicle at any time. The vehicle can also park itself in its garage, without a driver.

Lidar (Laser Imaging Detection and Ranging), or laser scanner, works by emitting short luminous pulses in the infrared spectrum. It has an emitter and a receiver: when the emitted light ray reaches an object, it is reflected and received by the receiver, which generates an electric signal. The distance between the emitter and the obstacle is determined by measuring the pulse's travel time.




18.10.2017

Resp..: Valeria Kulikova

# Autonomous vehicle driving of new Audi A8

The lidar's rotating mirrors catch the light reflected by obstacles to create an image of the vehicle's environment and the angle sensor developed by NTN-SNR measures their motion with great precision. NTN-SNR's device combines two components: a dual track magnetic ring fitted on the mirrors' rotor motor and a fixed sensor that measures the angular position of the rotor. NTN-SNR has developed a very high-resolution sensor with more than 5,000 fronts per revolution for a measurement accuracy of a few tenths of a degree. Furthermore, thanks to the second track, a reference pulse determines the “absolute” angular position of the mirror in its environment and confirms it on each revolution. This very high resolution was a prerequisite for equipping the lidar with magnetic sensor technology, which is cheaper and more robust than an optical sensor.

Valeo’s SCALA comprises 4 laser diodes with a wavelength that project their beam onto a triangular prism with two mirrored faces. The mirrors turn continuously, scanning an angle of 145° 25 times per second and deflect the reflected beams onto optical receivers. SCALA delivers a 3D view of the surroundings with a distance accuracy of a few centimeters. Recognition of the points measured on each scan serves to build up a history to determine the relative speed of the detected object.

After the launch of mass production in 2017, NTN-SNR will produce more than 150,000 parts per annum starting in 2019 and is already working with Valeo on the second generation of lidar.