

The A-List: Things a car needs to be autonomous



Vision-based smart sensor

Smart sensor detects vehicles, pedestrians and other objects for sensor fusion, a software that combines data from several sensors.



Front Lidar*

A 16-layer, 3D Lidar* sensor scans the area within a 100m radius for real-time vehicle localisation using the 3D map created.



High-sensitivity camera

Front-facing mono camera vision sub-system detects and classifies objects of interest for sensor fusion, and extracts important information encoded in the objects' textures (eg., traffic light, traffic signs).



Top Lidar*

A 64-layer, 3D Lidar* sensor on the roof scans the area within a 120m radius for the creation of a 3D map and the environment perception, including the detection of vehicles, pedestrians and kerbs.



GPS antenna

A sensor provides the geo-referenced position of the autonomous vehicle up to the centimetre accuracy in real-time kinetic mode.



Rear radar



Lidar* for 360° object detection



Distance measurement instrument (DMI)

A wheel-speed sensor mounted on the left rear wheel measures the distance travelled by the autonomous vehicle and helps to provide its position on the map accurately.

Front radar

Sensors with two detection ranges – mid and long. Mid-range detection covers 60m in front and has a field of view (FOV) of 45 degrees. It is useful for tracking vehicles cutting in from adjacent lanes and identifies pedestrians crossing in front of the vehicle. Long-range detection covers 174m and has a smaller FOV, of 10 degrees. It is used to maintain a safe distance when cruising.



Lidar* for 360° object detection

Six 8-layer laser scanners combine into a single sub-system to deliver 360-degree coverage and perception of dynamic objects and static obstacles with precise distance measurements.



Inertial measurement unit (IMU)

An inertial sensor, including a 3-axis accelerometer and a 3-axis gyroscope, provides the position and orientation of the vehicle by integrating their measurements over time.