3 types of sensors in autonomous vehicles and their advantages and disadvantages

The majority of today’s automotive manufacturers most commonly use the following three types of sensors in autonomous vehicles: cameras, radars, and lidars.

Camera sensors

Autonomous cars often have video cameras and sensors in order to see and interpret the objects in the road just like human drivers do with their eyes. By equipping cars with these cameras at every angle, the vehicles are capable of maintaining a 360° view of their external environment, thereby providing a broader picture of the traffic conditions around them. Today, 3D cameras are available and utilized for displaying highly detailed and realistic images. These image sensors automatically detect objects, classify them, and determine the distances between them and the vehicle

Radar sensors

Radar (Radio Detection and Ranging) sensors make up a crucial contribution to the overall function of autonomous driving: they send out radio waves that detect objects and gauge their distance and speed in relation to the vehicle in real time.
Both short- and long-range radar sensors are usually deployed all around the car and each one has their different functions. While short range (24 GHz) radar applications enable blind spot monitoring, the ideal lane-keeping assistance, and parking aids, the roles of the long range (77 GHz) radar sensors include automatic distance control and brake assistance

Lidar sensors

Lidar (Light Detection and Ranging) sensors work similar to radar systems, with the only difference being that they use lasers instead of radio waves. Apart from measuring the distances to various objects on the road, lidar allows creating 3D images of the detected objects and mapping the surroundings. Moreover, lidar can be configured to create a full 360-degree map around the vehicle rather than relying on a narrow field of view. These two advantages make autonomous vehicle manufacturers such as Google, Uber, and Toyota choose lidar systems.
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