Different sensors which are used are:

1. LIDAR (Light detection and ranging)

2. 3d cameras

3. Ultrasonic sensors (infrared sensors are rarely used since a lot of factors affects its precision)

4. Radar sensors

Disadvantages:

LIDAR:

* They are very expensive which prevents them from being used in many applications.
* LiDAR pulses can be affected by heavy rains or hanging clouds because of the effects of refraction.
* LiDAR does not work well in areas where there are high sun angles huge reflections since the laser pulses depend on the principle of reflection
* LiDAR collects a huge dataset that requires high level of analysis and interpretation. Thus, it takes a lot of time to analyse the data

3d cameras:

* The weather conditions like cloudy and foggy weather affects it.
* Cameras have the same issues in different light and weather conditions.
* The depth data which is computed using algorithms may not be accurate

Ultrasonic sensors:

* Change in nature for example temperature, airborne particles, weight, air turbulence, influence ultrasonic reaction.
* It has more difficulties in reading reflections from soft, curved and thin as well as a small object.

Radar sensors:

* Usage of shorter wavelength does not allow the detection of small objects.
* RADAR cannot provide the user with the precise image of an object because of the longer wavelength.

Advantages and the cases when they are used:

LIDAR:

* A LIDAR can build an exact 3D monochromatic image of an object.
* LiDAR technology can be used in day and in night. This is due to the active illumination sensor which is not affected by light variations such as brightness and darkness of light. Thus, improving its efficiency.

3d cameras:

* Low cost
* Vision like sensory.
* with help of computer vision and advanced algorithms we can easily detect obstacles

Ultrasonic sensors:

* low cost
* They work well in fog and low light night time situations unlike cameras.

Radar sensors:

* RADAR can easily operate in cloudy weather conditions, and at night.
* RADAR is better when constantly detecting the distance to the target is more important for your use.

Sensor fusion:

Sensor fusion is the ability to bring together inputs from multiple radars, lidars and cameras to form a single model or image of the environment around a vehicle. The resulting model is more accurate because it balances the strengths of the different sensors. Vehicle systems can then use the information provided through sensor fusion to support more-intelligent actions.