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Self-driving Car module:

ROS:

ROS is acronym for "robot operating system" that used in many robotics nowadays in addition containing.

A lot of software libraries and tool that facilitate programming a complex robot in addition to the contributor a developer that develop and create packages that facilitate programming robotics software. And it only installed on Linux based system such as Ubuntu. The workspace that used contain 3 main directory: 1-build 2-devel 3-src. It can be programmed by Python or C++ .

AirSim:

Airsim is a simulator build by unreal engine used to simulate Cars and drones so that it mainly used in AI research center, it can be used in different operating system.

SLAM:

SLAM is acronym for "Simultaneous localization and mapping", most used types: 1-Fastslam 2-occupancy grid SLAM 3-graph SLAM. SLAM used in making map and localizing robot in the same moment it with in the map it mainly depend on particle filter on estimation process

LIDAR:

Lidar is acronym for "light detection and ranging" it's working mechanism as follow it have a rotating mirror with (600 to 4800 RPM) that reflect a shiny laser beam and it depend on measuring flight time of each beam , it has significant aerodynamics forces, it has longer range and higher accuracy. It can be used in distinguishing between different object and draw maps

Navigation control:

It's used to in path planning to and determine the shortest distance between one point and it use A* algorithm in Path searching

Kalman filter:

It's used in filter and noise remover but the sensor should follow a Gaussian distribution or it will not work, but EKF (extended kalman filter) can work with non-Gaussian sensors. They are used in localization and sensor fusion.

LaserNet:

The main sensor used is LIDAR, The LiDAR produces a cylindrical range image as it sweeps over the environment with a set of lasers. The horizontal resolution of the image is determined by the rotation speed and laser pulse rate, and the vertical resolution is determined by the number of lasers