

ABSTRACT

For autonomous vehicle driving technology to move forward from the testing phase to actual self-driving car, safety measures and error minimization plays a key role. This project explains the techniques to outline the road lanes through the lane detection method. The width of the road lanes can be explicitly calculated to define the relative position of the vehicle in the defined lane. Inbuilt camera sensor produces lots of information from the surrounding which are processed through a machine vision system. The advanced system predicts trajectories collected during human handling of the vehicle and employs these to produce automatic tags for training a semantic-based pathway prediction model. Besides, a camera's actual inclination angle and the lane width can be obtained by active normalization. This approach is used to find the lane and width of the road from both sides effectively when there is a hindrance on one side. The drivable route knowledge is necessary particularly in unorganized situations and is crucial for an intelligent transport system to get reliable driving choice.

This project focuses to build an autonomous car prototype monocular vision with the help of Raspberry Pi as a processing chip. The model will perform few basic tasks that include self-driving on track and will help in obstacle detection and collision avoidance. A camera module along with an ultrasonic sensor is used to provide necessary data from the real world to the car. The collected data is then trained, analyzed, the relevant information and details is alerted back to car for appropriate actions to be taken. The car is capable of reaching the given destination safely and intelligently thus avoiding the risk of human errors. Algorithms like lane detection and obstacle detection are combined together to provide the necessary control to the car. Lane detection and obstacle detection is implemented using camera module and ultrasonic sensor.