Project Synopsis

Title: Autonomous Bot using Computer Vision

# Description:

Inspired by the famous Google Driverless Car, this project imparts a scaled down autonomy to vehicles that can be utilized efficiently in various applications. While Google Driverless cars use LIDAR technology for environment sensing, using such an advanced tech for small scale applications become superfluous and economically impractical.

This project thus provides an alternative using Image Processing, Computer Vision and Machine Learning. It presents a working model of an autonomous robot which uses Computer Vision and Machine Learning for Obstacle Classification. Machine Learning is used for training of the dataset of various obstacles types. Computer Vision is used to grab and process the video images captured by the web camera eye of the robot. Image processing is used for other image operations like detecting moving obstacles, colours, signs prevailing in the surrounding of the robot.

The hardware backbone of this system is a robotic vehicle which is controlled by an Arduino microcontroller. The Arduino chip is used to control and pass signals to the motors and the line sensors. The Arduino – MATLAB interface forms the link between hardware and software. The decision taken by the processing module regarding the obstacle is relayed to the motors via the Arduino.

The prototype model uses line following technology to guide the robot through the pathway. Range Sensor are used to guide the robot through obstacle without crashing sideways. The Hardware backbone of this prototype is built up using simple microcontroller, sensor and motor drivers that are used for relaying the information between hardware and software.