Title: Adaptive High beam Assist

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Platform: Firebird V P89V51RD2

Introduction:

The high-beam assistant is a feature available in High End luxurious cars. Car automatically switches the headlights from high beam to low beam as soon as it detects oncoming traffic or adequate street lighting. A camera integrated in the rear-view mirror monitors ambient brightness and traffic conditions, and can detect approaching traffic up to one kilometer away. When the road ahead is clear again, the system automatically switches up to high beam again.

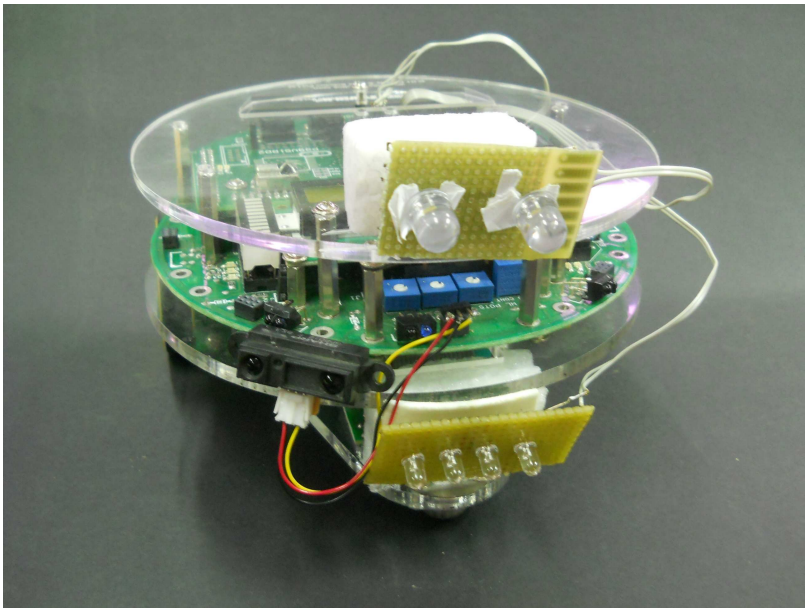
Description:

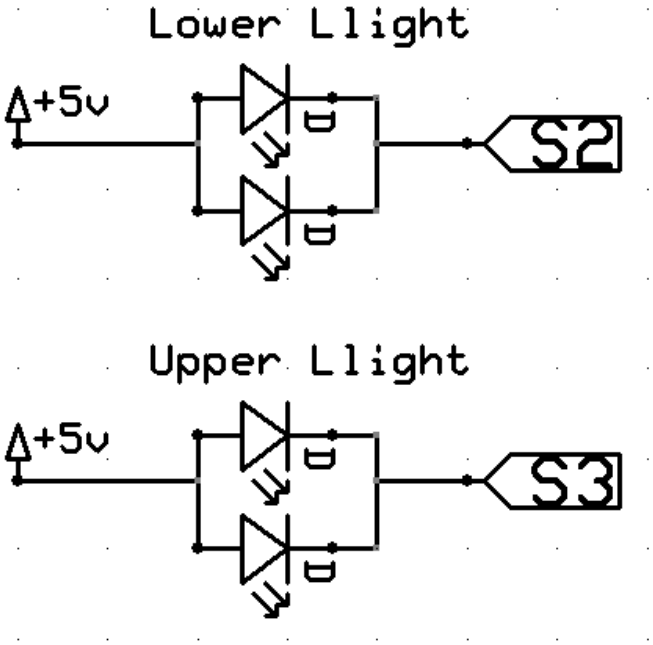
Assumptions:

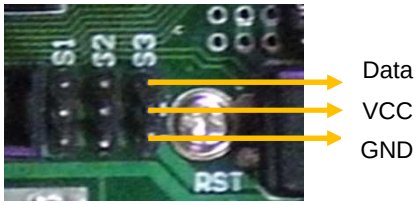
1. The road is divided into two lanes for vehicles going in separate direction. Each lane is a white line and there is sufficient distance between the 2 lanes.
2. Vehicles do not change their speed.

Setup:

For detecting upcoming vehicle, we are using Sharp Sensor GP2D120 which measures the distance between 4cm to 30cm. We want to detect upcoming vehicle for switching the light beam from high to low.







Working:

Initially the bot is moving on the left lane with no vehicle close ahead in front. The front Sharp IR sensor is placed slight right side. (Refer above image).

As soon as the upcoming bot detected by Sharp IR sensor within a range of 10cm, it automatically switches high beam to low beam. After passing the bot, it again switch it beam to high.

References:

Fire Bird V P89V51RD2 Hardware Manual.
Fire Bird V P89V51RD2 Software Manual.