



### 4.3 Basic Circuit

The information from the sensor is fed into the Arduino and then into the microprocessor, where the logic is applied as to tell the sensor what color to recognize. A block diagram of the visual system is given below:



Figure 3: Block diagram of the basic visual system

The CdSe/CdS Photocell senses the oncoming traffic lights and recognizes the wavelengths of the colors. This information is fed into the Arduino where this information is digitized. The microprocessor takes the digital data and produces respective response at the final output.

### 4.4 Calculations

Resolving the signals at a distance is important. The minimum angle can be calculated using the following formula

$$\theta = 1.22 \frac{\lambda}{D} \quad (1)$$

Wavelength (for LED signals) for red is 657 nm and for green it is 400 nm.

Assuming the maximum distance to be 300 m, and the diameter of the signal is 12 inches, a 2 megapixel camera meets the above requirements.

## 5. Conclusion and Future Scope

This idea can be further developed in such a way that it can overcome the following shortcomings:

- Different signal standards in different regions
- Environmental factors
- Increase in the length of sensitivity
- Higher resolving power of the sensor

Some of the updates which can be done on this proposed system are:

- Can be developed into an app
- Can be integrated with the car's navigation system

## References

- [1] "Types of Color Deficiencies". Konan Medical. Retrieved 2016-03-21.
- [2] "Traffic Light Signals and Red Light Cameras". Geocities.com. Retrieved 2016-03-21.
- [3] Pearce, Joshua M. 2012. "Building Research Equipment with Free, Open-Source Hardware". Science 337 (6100): 1303–1304. (open access)

- [4] Using an RGB LED to Detect Colours [Online]. Available: <http://www.instructables.com/id/Using-an-RGB-LED-to-Detect-Colours/> [Accessed: March 25, 2016]
- [5] PGM5506 Datasheet, Token Passive Components. Retrieved 2016-03-25.

## Author Profile



**Ravi Shankar** received his Bachelors in Physics from Sri Sathya Sai Institute of Higher Learning, Bangalore, India in 2010. He is pursuing his Masters in Computer Application in Dr. L.B. College, Visakhapatnam, India. He has written a paper on the use of computers in the field of Physics and its applications (Use of C++ to determine risk of a nuclear establishment, under review).



**Krishna Peri** is pursuing his Bachelors Degree in Information Technology in Gandhi Institute of Technology And Management, Visakhapatnam, India. He is currently working on the development of the project, "Secured Hash Password Authentication" as a part of his undergraduate curriculum.