

Final Project
ME-GY:6933 Advanced Mechatronics
INTELLIGENT Street Lighting
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Abstract – The amount of electricity consumed is of concern. Especially considering the current scenario ore amount of electricity is consumed due to streetlights. It is because of the continuous operation of the lighting during the nighttime. To overcome this, it is mandatory to save the amount of energy during the unused hours. Hence, we came up with the idea of an intelligent Street Lighting where using the photo-resistors, LED's and resistors we can make it happen which is seen in the later part of the report.

INTRODUCTION:

In today's world, majority of the electricity produced is used for the street lighting due to its continuous operation during nighttime. In order to minimize the electricity consumption, wealthy technology has to be implemented and this will give us the glimpse of the dynamic working of the streetlights. The lighting levels and the intensities will be adjusted dynamically through the sensors.

Streetlights are an indispensable part of our life and streets. It is something that helps us to see the road to our destination in the dark. So therefore, we can consider it to be very useful in our lives. But when we see these streetlights are on even during natural day lights are available, it is a wastage and ultimately affects our environment.



Fig1.

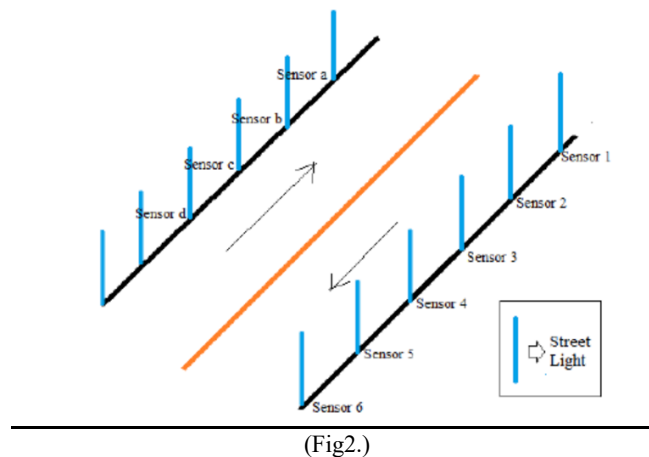
This (Fig1.) shows the community report of UAE in some gulf country published by some residence where we can see that the lights were kept on during to the daytime which can be a total waste of energy. Thus, by using the automatic street lighting we can easily avoid such situations and make sure that it doesn't repeat I n the future in some other country.

EFFECTS ON WILDLIFE AND ECOSYSTEMS:

- Scientific evidence suggests that artificial light at night has negative and deadly effects on many creatures including amphibians, birds, mammals, insects and plants.
- Artificial streetlights disrupt this nocturnal activity, interfering with reproduction and reducing populations.
- Many insects are drawn to light, but artificial lights can create a fatal attraction.

New York, NY – Light pollution can harm wildlife and make it hard to stargaze let alone for New Yorkers to get a good night's sleep. Under new legislation from Council Member Ben Kallos, streetlights would be “fully shielded” to stop them from shining up into the sky or the windows of nearby residents, instead only illuminating the sidewalks and streets intended.

ARCHITECTURE OF THE MODEL:

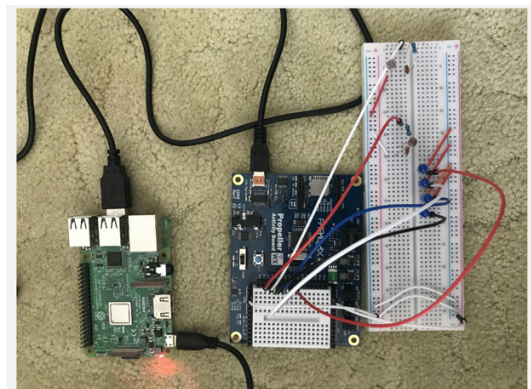


HARDWARE AND CIRCUIT:

Hardware Used for the Project

1. Raspberry Pi
2. Parallax Propeller Activity Board
3. Photoresistors
4. LEDs

(Fig3.)



(Fig4.)

WORKING:

Here the working of this project is such that in the Raspberry Pi we have downloaded the Simple IDE for Parallax Propeller wherein we coded for the project. We have two photoresistors one of which detects whether there is a day or night through RC time function. The second photoresistor detects a vehicle incoming through the vehicle's headlight. Once the both the photoresistor detect night and vehicle respectively then the street lights turn on and once the vehicle passes one photoresistor on a light pole and gets to another photoresistor on another light pole where this light pole detects the light of the vehicle then the previous street lights turn off and the next street light turn on. This is the working of the project.

BILL OF MATERIALS:

Items	Quantity	Price
Propeller Activity Board WX	1	\$79.99
Raspberry Pi (Kit)	1	\$79.99
LEDs	4	N/A
Photo Resistors	2	N/A
Capacitor	2	N/A
Total		\$159.98

(Fig5.)

CODE:

```
#include "simpletools.h"           // Include simple tools
#define ledpin1 5
#define ledpin2 6
#define ledpin3 7
#define ledpin4 8
int main()                        // Main function
{
    pause(500);
    printf("Smart Street Lightining System\n");
    while(1)
    {
        high(3);
```

```

pause(100);
long time = rc_time(3,1);
if (time > 50000)
{
    printf("It is Night Time\n");
    high(2);
    pause(100);
    long time1 = rc_time(2,1);
    printf("The RC_TIme is %6d\n",time1);
    if(time1 < 5000)
    {
        printf("Car is Present\n");
        low(ledpin4);
        high(ledpin1);
        pause(500);
high(ledpin2);
        pause(500);
        high(ledpin3);
        pause(500);
    }
}

else if(time1 > 15000)
{
    printf("Car checked into another lighting pole\n");
    low(ledpin1);
    high(ledpin2);
    pause(500);
    high(ledpin3);
    pause(500);
    high(ledpin4);
    pause(500);
}
}
else if(time < 50000)
{
    printf("It is daytime\n");
    pause(100);
    low(ledpin1);
    low(ledpin2);
    low(ledpin3);
    low(ledpin4)
}
}

```