Rain Sensing Car Wiper

Miss. N. S. Sasane[1], Mayur Jankar[2], Omkar Waghmode[3], Yougesh Suryanshi[4], Adarsh Badave[5]
Lecturer, Department of Electronics and Telecommunication Engineering[1]
Students, Department of Electronics and Telecommunication Engineering[2,3,4,5]
Sanjay Ghodawat Institute, Atigre, India

Abstract*: The project is designed to develop an automatic wiper system that switches a motor on or off upon sensing the rain. The advantage of using this method is to reduce manual intervention. Working of a windshield wiper is a manual procedure which requires to be switched on to remove rainfall and debris from the screen. This does not only require driver's attention, but also, causes a certain level of discomfort to the driver and serves as a source of distraction which increases the risk of accidents. To offer comfort to the driver and essentially reduce the risk of accidents, an automatic rain sensing device has become a necessity. While such a device is available in the market, its high cost and other such limitations have made it less popular in the automobile industry. Aim of this work was to propose another such model in market that limits the cost while maintaining the efficacy. A rain sensor, humidity sensor and arduino are the major components used in the construction and seamless working of the proposed device.*

Keywords: Arduino application.

I. INTRODUCTION

A windscreen wiper is an essential device that comes pre installed in almost all motor vehicles including trains, cars, buses, some aircrafts, watercrafts etc. Operation of these wipers in the existing models is yet manual. The physical model of the operation includes two arms twirling at one end back and forth over the glass. The arms have long rubber blade attached. While one end of the arms is attached, the other end pivots. The blade when swung back and forth over the glass pushes water from its surface providing good visibility to driver. The speed of the central shaft is adjustable. A range of several speeds and at least one or more settings that let you set the speed in between are provided. These settings are commonly labelled as "intermittent" settings. To generate the force to accelerate the wiper blades a worm gear is used. The implementation of new technology in the current scenario can help to tackle the issue at hand. Using automation and IOT technologies to automate the working of the wipers using specific sensing devices can help reduce the risk of accidents and offer comfort to the people. These implementations that we aim to offer through this project has high flexibility, is quite reliable and accurate. The main theme in this project is to develop an automatic rain sensing car wiper to automatically detect precipitation. The system has been designed in a way which ignites the wiper blades to push off the water falling over the glass in the event of rainfall. This system aims to give better visualization to driver without involving the efforts of driver. Thus limiting the distraction Arduino UNO board, a rain sensing module, a servo motor and a LCD are the main set of requirements used in the construction of the said system. In this setup, the microcontroller adjusts the speed of the servo motor according to the signal given by the rain sensing module.

II. LITERATURE SURVEY

[1] P. Abhilash Reddy
The issue of driver's safety is of great importance in today's automotive industry. In many cases, a lack of proper vision is responsible for accidents during heavy rainfall. In many cases, manual errors like not increasing the speed of the wiper by the driver lead to accidents. Today's car wipers work on the principle of manual switching. In this paper, we proposed an automatic rain sensing wiper system that detects rain and starts automatically and stops when the rain stops. The automatic rain sensing car wiper system is not only automatic but also intelligent.

[2] Kerry C. Harrington
Wiper applicators allow herbicides to be directly transferred onto the surface of target plants, thereby avoiding application to nearby desirable plants of shorter stature. This form of herbicide application can greatly reduce costs of.

The risk of drift to susceptible plants in areas adjacent to the weed control operations can also be eliminated by using wiper applicators.

[3] AntonKummert

An intelligent weed control and risks of environmental contamination wiper speed adjustment system can be found in most middle and upper class cars. A core piece of this gadget is the rain sensor on the windshield. With the upcoming number of cars being equipped with an in-vehicle camera for vision-based applications the call for integrating all sensors in the area of the rearview mirror into one device rises to reduce the number of parts and variants.

Problem Definition

Modern cars come equipped with a variety of facilities. While these facilities are incorporated in the four wheelers for entertainment and recreational purposes and aim to enhance the overall travelling experience, these features also serve as a means of intrusion and causes confusion and hysteria. In monsoon, rainfall adds to the list of distractions and makes driving a tedious task. As mentioned earlier, these distractions often become a source and cause of severe accidents that are sometimes unfortunately catastrophic. Various services are being actively included in the automobiles to ensure safety along with comfort of the driver. Several automobile companies have looked at the prospect of making the working of wipers automatic. Even today, only luxury cars come equipped with automatic rain sensing wipers, major reason being the cost. To make economical and reliable automatic rain sensing wipers and their installation has been a challenge that the automobile sector hasn't been able to tackle.

Objective:

- This system makes use of optical sensors to detect the rain drops and thus switches on the blades.
- Integration of existing wiper system with custom designed sensors and controllers were done to implement this system.
- The detection of rain drops by the installed rain sensor is based on the fact that the shift or change in light intensity server as an input for the sensor

III. BLOCK DIAGRAM
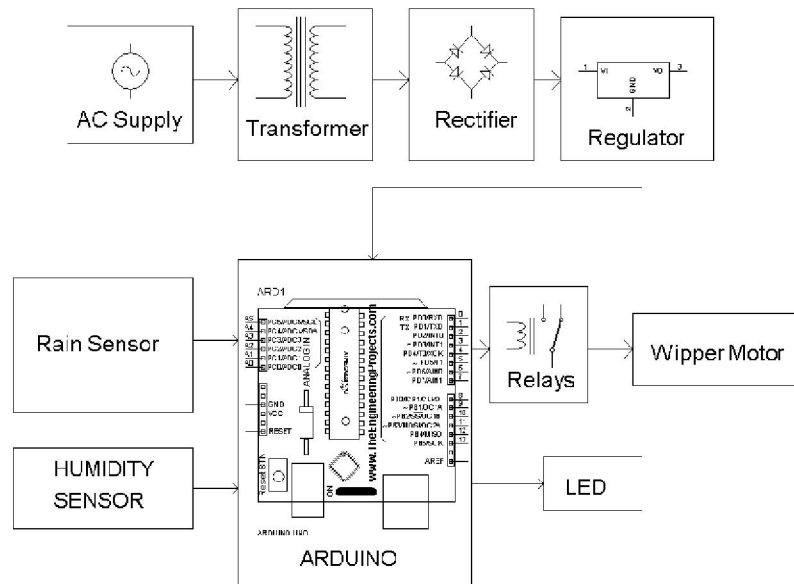
Proposed Methodology of Solving Identified Problem

The proposed system aims to provide a low cost, efficient and reliable solution to the defined problem. The model is practically cheeked against deformities and malfunctioning due to presence of non-essential elements- natural or artificial in nature. Hindrance due to the presence of dust particles, stones etc. is a bare minimum. In subsequent sections, we will be presenting a list of all the required tools and also provide an in-depth description of each of the tools in the list. We will be discussing the modelling and working of rain sensors along with the other components of the device to explain the overall working of the automated rain sensing wiper model.

Arduino UNO:

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program.
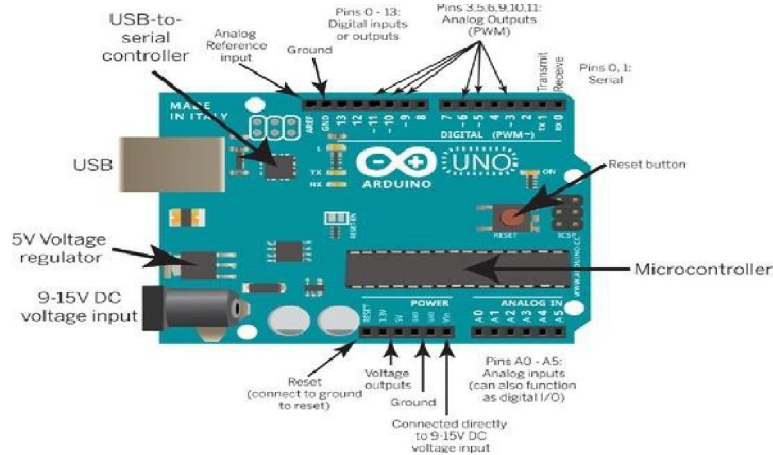
Power Supply:

- The circuit uses standard power supply comprising of a step-down transformer from 230v to 12v and 4 diodes forming a Bridge Rectifier that delivers pulsating dc which is then filtered by an electrolytic capacitor of about 470microf to 100microF.
- The filtered dc being un regulated IC LM7805 is used to get 5v constant at its pin no 3 irrespective of input dc varying from 9v to 14v.
- The regulated 5volts dc is further filtered by a small electrolytic capacitor of 10 micro f for any noise so generated by the circuit.
- One LED is connected of this 5v point in series with a resistor of 330ohms   to the ground i.e. negative voltage to indicate 5v power supply availability.
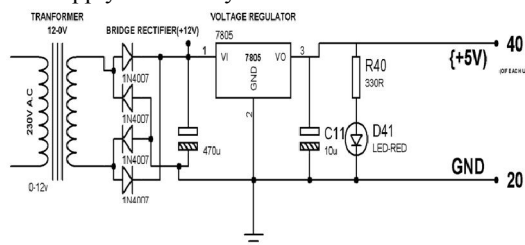
Rain Sensor:

The most common modern rain sensors are based on the principle of total internal reflection An infrared light is beamed at a 45-degree angle into the windshield from the interior. To test the Rain Sensor and ensure that it is working correctly connect the VCC to a 5v power source and GND.Try placing a few droplets of water on the Rain sensor detection board and the D0-LED should light up

DC MOTOR

A DC motor is an electric motor that runs on direct current (DC) electricity. In any electric motor, operation is based on simple electromagnetism. A simple 2-pole DC electric motor (here red represents a magnet or winding with a "North" polarization, while green represents a magnet or winding with a "South" polarization). Every DC motor has six basic parts -- axle, rotor (a.k.a., armature), stator, commutator, field magnet(s), and brushes.
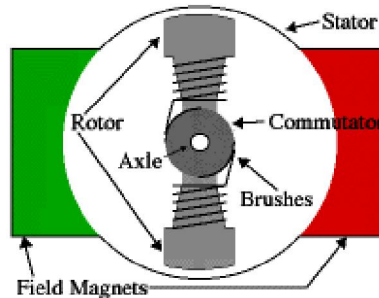
Benefits:

- Reduces driver distraction and increases safety
- Automatic wiper operation
- Automatic air conditioning to compensate sun-light

Advantages

1. Low cost system, providing maximum automation
2. Low maintenance and low power consumption
3. The system is more compact compared to the existing ones, hence is easily portable.
4. Provides a user-friendly interface hence will have a greater acceptance by the technologically unskilled workers.

Disadvantages

1. The rain sensor based system functions when water falls on the sensor directly
2. The cost of overall system increases as additional components are needed along with rain sensor.
3. In order to avoid false detection of rain, it requires rain sensors to take decision after few minutes.

IV. CONCLUSION

An automatic wiper control system will be the modified version of the intermittent wiper system. This system will improve the driver's level of comfort. Its need is more especially for the drivers who have to work night shifts and drive in the areas prone to traffic where drivers have to give maximum concentration on the brakes and clutches. The wiper

controlling task during the rainfall is eliminated with this implementation. This system contains high precision, high accuracy

REFERENCES

[1]. Hideki Kajioka, et al.; FUJITSU TEN Tech J. No. 2; 1989; Page No. 69.

[2]. Mukul Joshi, KaustubhJogalekar, Dr. D.N.Sonawane, VinayakSagare, M.A.Joshi; IEEE; 2013, Page No. 40.

[3]. P. Abhilash Reddy, G. SaiPrudhvi, P J Surya Sankar Reddy, Dr. S. S. Subashka Ramesh; International Journal of Advance Research, Ideas and Innovation in Technology, Volume 4, issue 5, 2018.

[4]. International Journal of Advance Research, P. Abhilash Reddy

[5]. Semi-Automatic Rain Wiper System, Tapan. S. Kulkarni

Copyright to IJARSCT
www.ijarsct.co.in

DOI: 10.48175/IJARSCT-16672

ISSN
2581-9429
IJARSCT

346