RAIN FALL SENSING AUTOMATIC CAR WIPER SYSTEM

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ABSTRACT; -

Over the past two decades, the automotive industry has aggressively researched ways to exploit modern computing and electronic advances in the development of safety, reliability and entertainment technologies for vehicles.The system is developed to mitigate driving distractions and allow drivers to focus on their primary task of driving. The distraction eliminated with the development of this product is the manual adjustment of windshield wipers when driving in precipitation.The few seconds that a driver takes their attention off the road to adjust a knob while driving in poor weather conditions could potentially lead to car accidents. The aim of this project is to help reduce accidents that happen as a result of the driver intending to clean the windscreen when rain is falling thereby taking the attention of the driver off the road when he or she is switching on and off the wiper. In rainy days we suffer from act of sprinkling of water on front glass of our wheeler. While driving car, driver cannot see on road vehicles. So, he tries operating wiper on glass, for that he should often switch on for operating wiper and because of this it might cause vehicle accident. If we apply any kind of sensor on glass which senses the act of sprinkling water,by automation the wiper will be operating automatically. When the water hit the sensor, it will send signal to the system thus moving the wiper motor. Once the sensor did not detect any water, the wiper will stop. This will reduce the weaknesses which have been stated at beginning. This proposed system activates the wiper to operate in fully automatic mode, to make a vehicle luxurious and to prevent accident.

Keywords: Wiper, Rain sensor.

I INTRODUCTION

The objective of this project is to offer a practical and efficient solution to the problems that occur when drivers are compelled to travel through rain or fog. Current glazing solutions require an operator with human qualities, which may annoy the driver and cause them to fail to modify their speed in accordance with the intensity of the downpours, thus increasing the risk of collisions. By applying cutting-edge technology including sensors and computerised control systems, the suggested "Rainfall Detecting Automated Car Wiper" system aims to solve these challenges and provide a higher degree of comfort and safety mode of transportation for the user.

Everyone who drives may find it difficult to take the road in pouring or cloudy circumstances because they limit insight and raise crash risks. Every automobile must have windscreen wipers, but traditional windscreen mechanisms demand operating by hand, which can be distracting for the driver. Additionally, the conventional wiper systems might not change the velocity in response to the number of downpours, and these may enhance the danger of collisions even more. We put up the "Rainfall Sensing Automatic Car Wiper" technology as a novel response to such problems.

II LITERATURE SURVEY

1). Automatic Rain Operated Wiper System in Automobile: A Review by Kothari Mohit, Shah Amit, Patel Vipul and Kadakia Nishant in International Journal for Scientific Research & Development| Vol. 3, Issue 02, 2015| ISSN:2321-0613 - In the world, now a day's use of transportation vehicles is drastically increased. So it is very important to improve the safety facility in automobile vehicles. For achieving and fulfill above concept it is very important to do the survey and analysis to detail the automatic operated wiper. Windshield Wipers plays an important role in assuring the drivers safety during travelling. So the aim is to develop a system which control the automatic operated Wiper which is based on electronic sensor is called Automatic Operated Wiper. From the research paper we study about different types of sensor use in automation for the wiper. By adopting this technique we can achieve the high safety of driver as well as passengers. From this system the driver can get better focus on road without any distraction while driving.

2). **Tapan S. Kulkarni, Harsh S. Holalad, July 2012, "Semi-Automatic Rain Wiper System," International Journal of Emerging Technology and Advanced Engineering, ISSN 2250-2459, Volume 2, Issue 7. -** 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, a microcontroller and a driver integrated circuit (IC) are the major components used in the construction and seamless working of the proposed device. Falling water is quickly and precisely detected by the rain sensor which then transmits the signal to the second component i.e., microcontroller which in turn energizes the driver IC to switch the required motion of the wipers on using servo motor. This device converts a cumbersome manual operation to a smooth automatic one.

3). **K. V. Viswanadh, January-2015, "Design & Fabrication of Rain Operated Wiper Mechanism using Conductive Sensor Circuit," International Journal of Engineering Research & Technology (IJERT), ISSN: 2278-0181, Vol. 4, Issue 01. -** This is an era of automation where it is broadly defined as replacement of manual effort by mechanical power in all degrees of automation. Now a days almost all the automobile vehicles are being atomized in order to reduce human efforts. The automatic rain operated wiper system is a fully automation project. This is a genuine project which is designed for automobile vehicles and is fully equipped by sensor circuit and wiper motor. This project work includes design and development of a control system based on electronically controlled automotive rain operated motor called automatic rain operated wiper.

III SYSYTEM REQUIREMENTS

SOFTWARE REQIREMENTS:

- Arduino IDE
- C programming language

HARDWARE REQUIREMENTS:

1. Arduino uno
2. DHT 11
3. Servo motors
4. Bread board
5. Jumper wires

IV METHODOLOGY

We propose Rain Sensing Automatic car wiper system which directly calculate the rain drop intensity using rain sensor and turn ON the wiper when rain starts adjust the wiper speed according to the intensity of rain and turns OFF the wiper when the rain stops. We calculate rain intensity using below formula:

Rain intensity = Amount of rainfall / Duration of time

Also detect the fog /mist present in the atmosphere where the driver cannot see the road properly and accidents may occur due to bad visibility of road here we came up with solution using DHT11 which detects the Temperature and Humidity of the atmosphere. When the Humidity reaches above 100% it is considered as a fog, and wiper turns ON if the fog is present. Wiper turns OFF if no fog is present. We calculate fog value using RH value calculated as: -

RH = (Actual vapor pressure / Saturated vapor pressure) * 100

Where, Actual vapor pressure is the pressure exerted by water vapor in the air. Saturated vapor pressure is the maximum pressure the water vapor can exert at a given temperature.
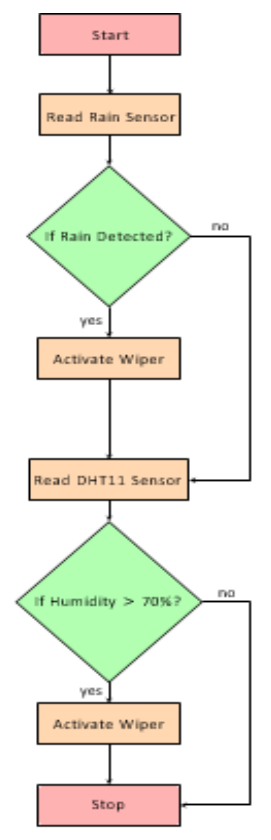
(i). FLOW CHART

Fig1: Flow chart of proposed system.

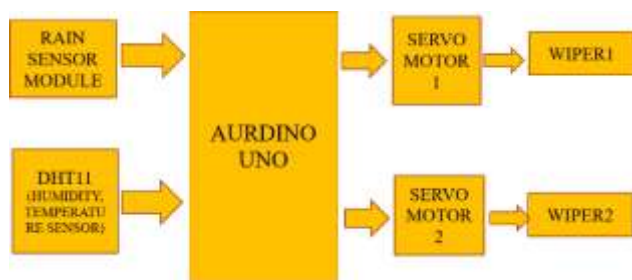## (ii). BLOCK DIAGRAM

Fig2. Block diagram of proposed system

Rain sensor detect the rain and sends the signal to Arduino UNO. Arduino UNO process the input data. Arduino UNO sends the Digital output to Servo Motors which is connected to wipers.

DHT11 detects the Humidity and Temperature of atmosphere when Humidity reaches 100% it is considered as a fog that signal is sent to Arduino UNO which process input and gives output from Servo Motors which is connected to wipers.
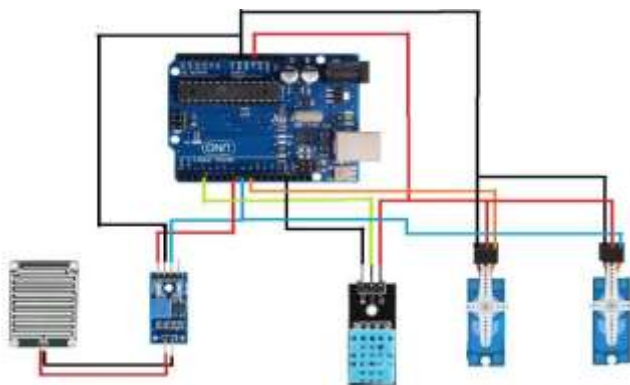
(iii) CIRCUIT DIAGRAM:

Fig 3: circuit diagram of proposed system

The circuit diagram of the project shown in Figure 22. Connect Rain Sensor A0 to Arduino UNO A0, VCC to 5V voltage pin. GND pin to ground pin. Connect DHT11 Data pin to Arduino pin no 2. VCC to 5V voltage pin, GND pin to ground pin. Connect Servo Motor 1 to pin no 9 of and Servo Motor 2 to pin no 10 of Arduino, VCC to 5V voltage pin. GND pin to ground pin.

V.RESULTS

Our proposed system and specifications. Based on the results collected by all the sensors, Rain sensor detected the rain with different levels of rain intensities and turn ON wiper when rain starts and adjust the wiper speed with respect to rain intensity levels, turn OFF the wiper when rain stops. DHT11 detect the atmospheric temperature, when temperature reaches 70% the wipers turn ON with slower speed, when the temperature is below 70% the wipers turn OFF. When the temperature reaches above 100% the wipers works with high speed.

IV. CONCLUSION

In conclusion, the rain sensing automatic car wipers project is a successful implementation of a rain sensing system that can detect rain and activate the car wipers automatically. The project utilized a rain sensor, Dht11 sensor, and servo motors to detect and respond to changing weather conditions, such as rain and fog.The methodology involved defining the problem, researching the topic, selecting appropriate components, designing the circuit, writing the code, testing the system, refining the system, and documenting the project. Through careful testing and refinement, the system was able to accurately detect rain and fog and move the wipers in the desired direction to clear the windshield. This project demonstrates the potential of using technology to improve driving safety and comfort, and can serve as a foundation for future developments in the field of weather-responsive automotive systems.

VI. REFERENCES

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