



AUTOMATIC RAIN SENSING WIPER

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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. With drivers exposed to an ever increasing number of distractions, automatic rain-sensing wiper systems become an even more appealing feature, as they work to minimize the time the driver must take his/her hands off the steering. Most traditional systems offer intermittent as well as variable speed operation. The traditional wiper system however requires driver constant attention in adjusting. Because the manual adjustment of the wiper distracts driver's attention, which may be a direct cause accidents. This project is for automatic wiper in various methods and also explains the basic skeleton for wiper automatically detects water on the windshield. The system activates the wiper to operate in full automatic mode and detect rain using rain sensor which is interfaced to the controller then that will make the wiper to move.

INTRODUCTION

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. With drivers exposed to an ever increasing number of distractions, automatic rain-sensing wiper systems become an even more appealing feature, as they work to minimize the time the driver must take

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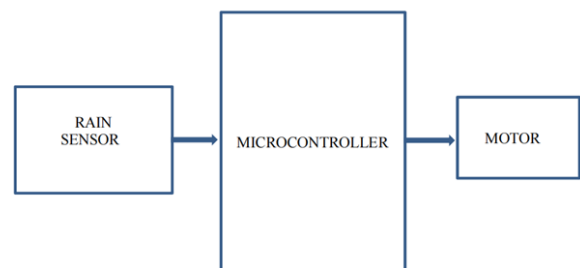
An embedded system is a special-purpose computer system designed to perform one or a few dedicated functions, sometimes with real-time computing constraints. It is usually embedded as part of a complete device including hardware and mechanical parts. In contrast, a general-purpose computer, such as a personal computer, can do many different tasks depending on programming. Embedded systems have become very important today as they control many of the common devices we use.

Since the embedded system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product, or increasing the reliability and performance. Some embedded systems are mass-produced, benefiting from economies of scale.

Physically embedded systems range from portable devices such as digital watches and MP3 players, to large stationary installations like traffic lights, factory controllers, or the systems controlling nuclear power plants.

Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure.

In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability. For example, Handheld computers share some elements with embedded systems — such as the operating systems and microprocessors which power them — but are not truly embedded systems, because they allow different applications to be load and peripherals to be connected.



ARDUINO UNO

Microcontroller as the name suggest, a small controller. They are like single chip computers that are often embedded into other systems to function as processing/controlling unit. For example, the control you are using probably has microcontrollers inside that do decoding and other controlling functions. They are also used in automobiles, washing machines,

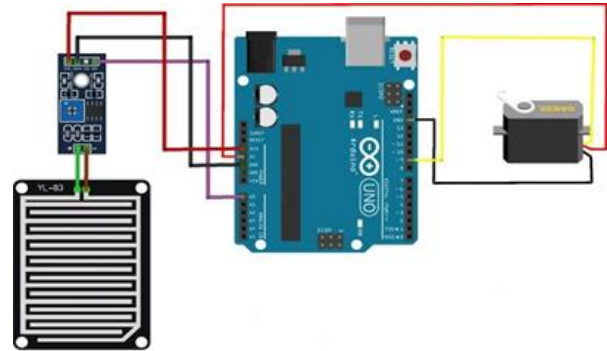
microwaves ovens, toys....etc, where automation is needed.

Arduino Uno Microcontroller:

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

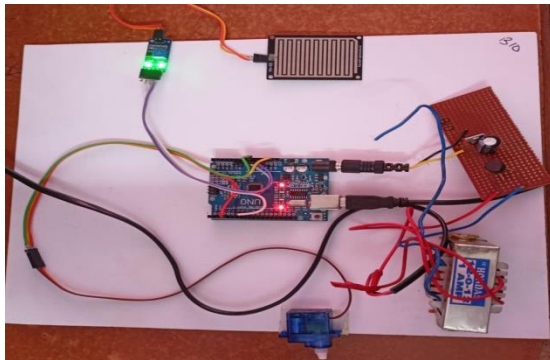
The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. "Uno" means "One" in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions, see the index of Arduino boards.

DESIGN IMPLEMENTATION



- The rain sensor is placed on the vehicle front glass. The rain sensor, servo motor and other required components get power from the battery.
- When the rain droplets fall on the rain board, the control board of the rain sensing unit sends the signal to the Arduino Nano module.
- A rain sensor detects the presence of water on the glass of the windshield. The sensor then prompts the car to turn on the wipers automatically whenever rain is detected.
- The Arduino Nano module then sends the information to the servomotor to turn on the wiper.
- The function of the servo motor is to convert the control signal of the controller into the rotational angular displacement or angular velocity of the motor output shaft. Servo motor is used to drive the joints.

- The servo motor then rotates the wiper in accordance with the signal given by the Arduino module.
- This system avoids the interaction of the vehicle operator to operate the wiper. So, operator will concentrate on the driving.



ADVANTAGES

- It can be easily and quickly installed in automobiles
- Low power consumption
- Simple and Portable
- Easy to implement
- Cost effective

DISADVANTAGES

- It is relatively uncommon
- It is a small circuit

APPLICATIONS

- Small circuit finds numerous applications.
- useful to vehicles.
- It can be implemented at house window for cleaning.

- A slight modification in it leads to better cleaning system.
- Prevents glass shields or bars from getting corroded

CONCLUSION

- The automatic car wiper system was developed to sense the rain and wipe the glass by moving the windshield wipers. By using automatic car wiper system, the purpose of driver's response to control the wiper is automated.

FUTURE SCOPE

- We can use a capacitive sensor which will enable it work along line of sight. The speed controlling mechanism can be added in this project which will make it work according to the intensity and speed of water coming on the sensor.

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