

## Clothes Protection from Rain Based on Internet of Things (IOT)

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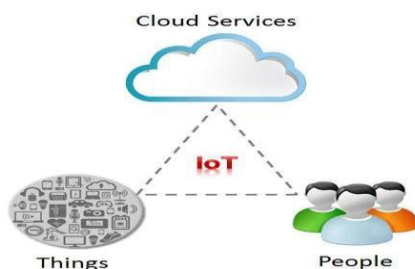
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**Abstract**— Now days it is difficult to predict the changes in season especially during rainy season. In rainy season it is very difficult to prevent the wet clothes from the rain. So there is need for human intervention to continuously monitor this. Keeping a person continuously watching for rain is too much stupidity as a waste of time. As the advancement in science technology is developing, the human comfort & needs are also increasing proportionally. Thus, it is important to take a small step towards the comfort ability and save our time. Thus, in this paper we have proposed a system which includes combination of sensor technology and Internet of Things (IoT). This proposed electro mechanical system(Arduino Uno, Sensor, Transistor and Diode) which continuously monitors the rain in rainy season and automatically takes back the clothes from rain to protect from wet and send fast information to user using GSM (Global System for Mobile) mobile device using SMS (Short Messaging System).

**Keywords:** *Internet of Things (IoT), Arduino Uno, Rain Drop Sensor, BC547 Transistor, 1N4007 Diode, DC Motor, GSM.*

### I. INTRODUCTION

The main objective of this paper is to make an automatic based system which protects clothes from being wet during rain without any human being. Use of microcontroller and the sensor based system, to frame and implement a system which protects the clothes automatically by detecting rain without the need of human being. The Internet of Things (IoT) is the network of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these objects to connect and exchange data. Each thing is uniquely identifiable through its embedded computing system but is able to inter-operate within the existing Internet infrastructure.



SMS (Short Message Service) is a GSM mobile technology that can perform remote communication wherever they are. Through this facility messages can send quickly, accurately and at a low cost. Mobile phone with SMS facility will be very useful when applied to integrated security systems, where the information send by a security system and the information received by the user mobile phone in the form of SMS.

### II. MOTIVATION

We decided to make an automatic system which protects clothes from being wet during rain, without any human being because it is a basic problem in the region where it rains heavily. It consists of microcontroller and a sensor. We are going to frame a controller that fulfills the automation work.

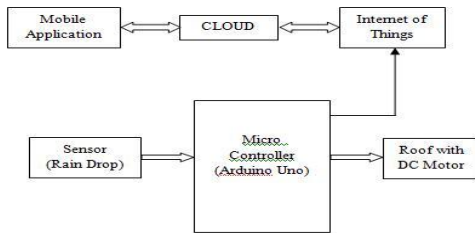
### III. WORKING METHODOLOGY

In this system, the thread is enhanced with the use of sensor to detect rain drops. The sensor used is rain drop sensor. When the sensor detects rain the motor will rotate anticlockwise and the thread will be pulled in and protect the clothes. If there is no rain, the motor will rotate clockwise and the thread will be pulled out. The concept behind this design is to combine both software and hardware. Software being the Arduino and Hardware is Arduino Uno microcontroller based sensor unit. In software part have developed code for microcontroller for controlling moving thread.

### IV. BLOCK DIAGRAM

In the above block diagram, there are four parts which as follows:

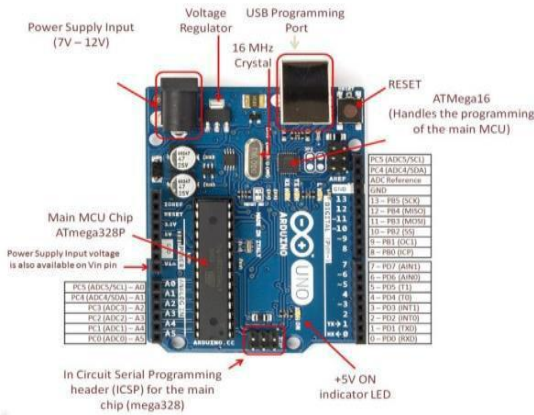
- Back End which includes dc motor, roof, rain drop sensor etc.
- 1. Arduino Uno (ATmega328)
- 2. GSM module is an interfacing system
- 3. Front end which includes a mobile device having android application



**V.COMPONENTS REQUIRED**

**5.1 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 ceramic resonator, 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.

**5.2 Arduino Uno Microcontroller**

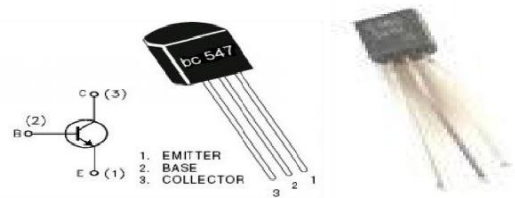
The rain sensor module is an easy tool for rain detection. It can be used as a switch when raindrop falls through the raining board and also for measuring rainfall intensity. The module features, a rain board and the control board that is separate for more convenience, power indicator LED and an adjustable sensitivity through a potentiometer.

The digital output is used in detection of drops in the amount of rainfall. Connected to 5V power supply, the LED will turn on when induction board has no rain drop, and DO output is high. When dropping a little amount water, DO output is low, the switch indicator will turn on. Brush off the water droplets, and when restored to the initial state, outputs high level.

**5.3 BC547 Transistor**

A BC547 transistor is a negative-positive-negative (NPN) transistor that is used for many purposes. Together with other electronic components, such as resistors, coils, and capacitors, it can be used as the active component for switches and amplifiers. Like all other NPN transistors, this type has an emitter terminal, a base or control terminal, and a collector terminal. In a typical configuration, the current flowing from the base to the emitter controls the collector current.

A short vertical line, which is the base, can indicate the transistor schematic for an NPN transistor, and the emitter, which is a diagonal line connecting to the base, is an arrowhead pointing away from the base.



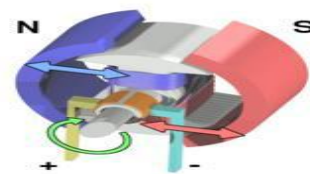
**5.4 1N4007 Diode**

This is a simple, very common rectifier diode. Often used for reverse voltage protection, the 1N4007 is a staple for many power, DC to DC step up, and breadboard projects. 1N4007 is rated for up to 1A/1000V.



**5.5 DC Motor**

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor.

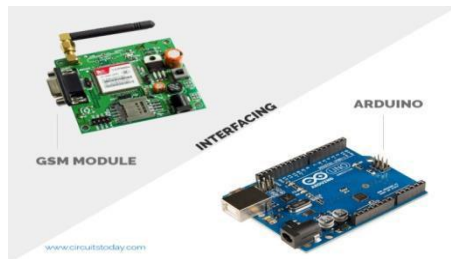


DC motors were the first type widely used, since they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or

by changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances.

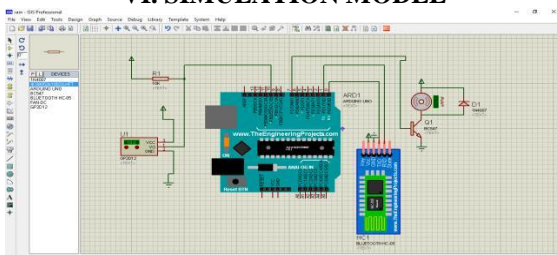
### 5.6 GSM Module

One of the essential elements of building IoT project is the ability to connect devices. Wi-Fi and Bluetooth are good low cost choices, but they work only at close ranges, or in hotspot areas. When the device needs to be at a remote location GSM is a good and easy to setup option.



The advantage of using a GSM communication with a system or device is that the user can control the system wirelessly no matter how far it is kept compared to any other wireless communication, provided that both the user and the device should be in a cellular coverage area. When it comes to a microcontroller based system a separate GSM module is used rather than using a cell phone as such. There are GSM modules available which can do serial communication with microcontroller based systems. The communication is done by sending or receiving AT commands with the GSM module.

### VI. SIMULATION MODEL



a) Circuit Design



(b) Roof Design

### VII. CONCLUSION

At the end, we were able to design a system, which can solve the problem better idea for drying wet clothes especially in rainy season. If Clothes are washed and dry by the washing machine there will be wetness in the clothes because of that bad smell is occurred. So that irritated and disturbing themselves. And there may be skin problems. Finally this system avoid above problems and gives good result. This automatic system enables us to carry towards the new technology. In this system we protect our clothes in rainy season automatically without need any human involvement. So it provides the comfortability, reduces the human effort and saves the time. We can easily used in home, office and wherever it can be used based on our requirement .So it makes life easy to our next generation.

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