AUTOMATIC ROOFING SYSTEM FOR CRICKET STADIUMS

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Abstract - *Cricket is one of the most popular game in this world. But one of the major problem that the Cricket stadiums are facing now a days is that the match gets either cancelled or delayed due to rain .This is the major drawback .So, to overcome this problem we are introducing an Automatic Roofing System for Cricket stadiums. In this system we are using Rain sensor, Humidity sensor, NodeMCU, DC Motor. The rain sensor senses the rain and humidity sensor senses the moisture continuously, when it rains the rain sensor passes the information to NodeMCU if the rain sensor fails then the humidity sensor passes the information to NodeMCU, then the NodeMCU operates the DC Motor and makes the roof close automatically. At the same time message is sent to the connected mobile device regarding the closing of the roof. When the rain stops or moisture gets dried up, the roof opens automatically.*

***Key Words*: NodeMCU, DC Rain Sensor, Humidity sensor, Node Motor, Retractable roof.**

1. INTRODUCTION

Cricket is one of the most popular game in the world. Many people enjoy it either watching in Television or by directly going to the stadiums. But the problem arises when it rains in the stadium during the match. As human beings we cannot control the natural phenomenon such as rain, humidity, high temperature, etc. The match gets either cancelled or delayed due to the rain. This is the major annoying problem as the result gets effected and also there will be some loss to the spectators too. Some of the measures are taken against this environmental hazard but they are performed manually. Here comes the need of automation .Soto overcome this problem we are introducing an Automatic Roofing System for Cricket Stadiums where the match can be still continued though it is raining. There will be retractable roofs which the rain stops. This system consists of Rain Sensor, Humidity Sensor, NodeMCU, DCMotor. Rain Sensor and Humidity Sensor work parallel such that if one of them fails to detect rain the other one performs the action. They pass the information to the NodeMCU. NodeMCU makes the roof closed with the help of DC motor. NodeMCU controls he speed and rotational direction of the DC Motor. Closes automatically when it rains and opens after.

2. EXISTING SYSTEM

Cricket is an international sport which has a huge fan base and it is popular all over the world and played by many countries. But sometimes the match gets halted or delayed due to rain. This causes loss to spectators and also disappointment to both the players and the audience. So, to overcome this problem that is to continue the game we need some roofing systems which cover the ground and the stadium. We have systems like roofing systems for crop fields, clothlines, homes etc. We have **Marvel Stadium** which is a multi-purpose sports and entertainment stadium which has Retractable roof of 38 meters (125 ft.) above the playing surface, opens east-west, and takes eight minutes to fully open or close. Its flood lights are built in to the stadium walls itself and the roof takes 8 minutes to close or open and this stadium is mainly used for the football leagues and other entertainment purpose. So, there are some drawbacks.

3. PROPOSED SOLUTION

Our system consists of a retractable roof which is build over the height of the flood lights so that the previous infrastructure of the stadium is not disturbed. The roof can be built to the already existing stadiums without demolishing or disturbing the construction. Whenever it rains the roof closes automatically with retractable roofs from the both sides and interlocks in the middle. It covers the entire stadium that is it covers the pitch, ground and audience too. When the rain stops the roof opens automatically .The time, it takes to close or open the roof is also less than 8 minutes, which is the default time for the Marvel Stadium.
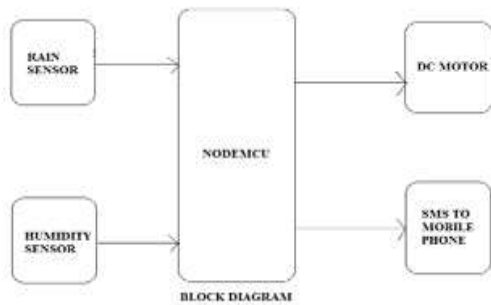
3.1 Implementation

Fig 1: Block diagram of automatic traffic routing system

3.2 NodeMCU

Fig 2: ESP8266 WIFI module

NodeMCU is an open source IOT platform. It initially included firmware which runs on the ESP8266 Wi-Fi SoC from Espresso Systems, and hardware which was based on the ESP-12 module. Later, designs based on the ESP32 32-bit MCU were added. Instead of using Arduino and GSM separately this NodeMCU offers both functionalities in it itself.

3.3 Humidity Sensor

Fig 3:Humidity sensor

Humidity Sensors are the low cost-sensitive electronic devicesused to measure the humidity of the air. These are also known as Hygrometers. Humidity can be measured as Relative humidity, Absolute humidity, and Specific humidity.

Based on the type of humidity measured by sensor, these are classified as Relative Humidity sensor and Absolute Humidity sensor.

3.4 Rain sensor

Fig 4: rain sensor

Rain sensor or *rain switch* is a switching device activated by rainfall. It works like a switch and the working principle of this sensor is, whenever there is rain, the switch will be normally closed. It is connected to the NodeMCU or Arduino UNO.

3.5 DC motor

Fig 5: Dc motor

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 in part of the motor.

CONCLUSION

In this paper our proposed scheme was automatic roofing system for stadiums ,Which it provide a automatic roof for the stadium when the rain sensor detects the rain and send the information to NodeMCU and an sms alert will be sent to the mobile number with registered user.

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