REAL TIME WEATHER FORECAST USING IOT

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Abstract

Imagine a world in which every device in the home, workplace and car are connected. A world where the lights automatically turn on when the car approaches the driveway, the coffee starts brewing when the morning alarm goes off and the front door automatically unlocks when approached by a member of the household, but stays locked when a stranger arrives on the front step. That is the type of world the Internet of Things can create. The Internet of Things (IoT) is the next frontier in technology, and there's already several companies trying to capitalize on it. Internet of Things is a term used to define adding Internet connectivity to formerly "dumb" devices, enabling them to communicate with users and other devices. Climatology and Weather Forecasting is important since it helps determine future climate expectations. There are several reasons why weather forecasts are important. They would certainly be missed if they were not there. It is a product of science that impacts the lives of many people. weather forecasts are important because of many reasons like, it helps curious people to know what sort of weather can be expected, Helps businesses and people plan for power production and how much power to use etc. So what if something is brought into picture that gives us weather predictions in an innovative manner i.e., it is really not possible for most of the people to go around the world. A Study says that out of 10, only 3 people are able to afford tourist costs. What if we work on something that not only depicts weather but also creates an environment where people would to get to see a mini experience of the weather conditions of any specific place across the world with a single touch.

Keywords: IOT, NodeMcu, Relay, Fog machine,

I. Introduction

The Internet of things (IoT) is the network of physical devices, vehicles, home appliances and otheritems 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. The figure of online capable devices increased 31% from 2016 to 8.4 billion in 2017. Experts estimate that the IoT will consist of about 30 billion objects by 2020. It is also estimated that the global market value of IoT will reach $7.1 trillion by 2020.The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. When IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyber-physical systems, which also encompasses technologies such as smart grids, virtual power plants, smart homes, intelligent transportation and smart cities.

II. System Architecture

Hardware Implementation

ARDUINO NODEMCU

NodeMCU is an open source IOT platform. It includes firmware which runs on the ESP8266 Wi-Fi SOC from Espress-if Systems, and hardware which is based on the ESP-12E module. The term "NodeMCU" by

default refers to the firmware rather than the dev kits. The firmware uses the Lua scripting language. It is based on the eLua project, and built on the Espress-if Non-OS SDK for ESP8266. It uses many open source projects, such as lua-cjson and spiffs.
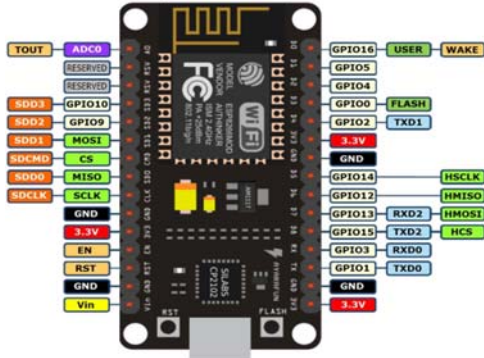

Fig 1:Pin description of NodeMcu

Relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

A fog machine , fog generator, or smoke machine is a device that emits a dense vapor that appears similar to fog or smoke. This artificial fog is most commonly used in professional entertainment applications, but smaller, more affordable fog machines are becoming common for personal use. Fog machines can also be found in use in a variety of industrial, training, and some military applications. Typically, fog is created by vaporizing proprietary water and glycol-based or glycerin-based fluids or through the atomization of mineral oil. This fluid (often referred to colloquially as fog juice) vaporizes or atomizes inside the fog machine. Upon exiting the fog machine and mixing with cooler outside air the vapor condenses, resulting in a thick visible fog.

Fig 2: mistifier

Water pump is responsible for the creation of rain. Aquarium pumps drive water into or out of filtration systems. The most commonly used aquarium pumps are power filter pumps, aeration-powered pumps, external pumps and submersible pumps. Pumps operate by generating pressure differences between intake and outgoing valves.
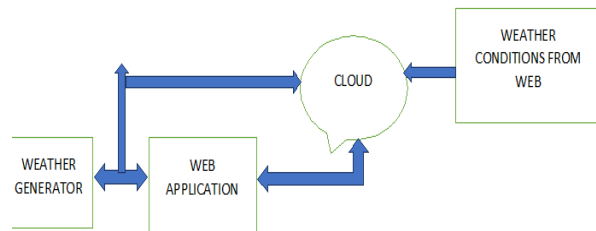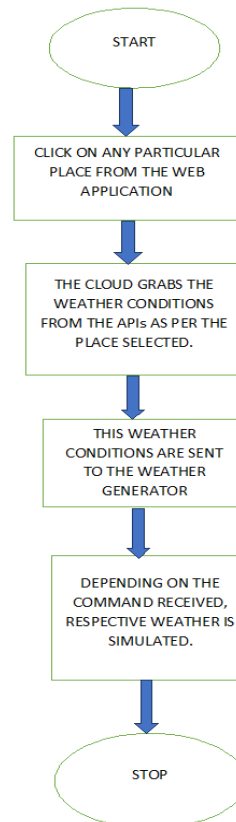

Fig 3: Block diagram

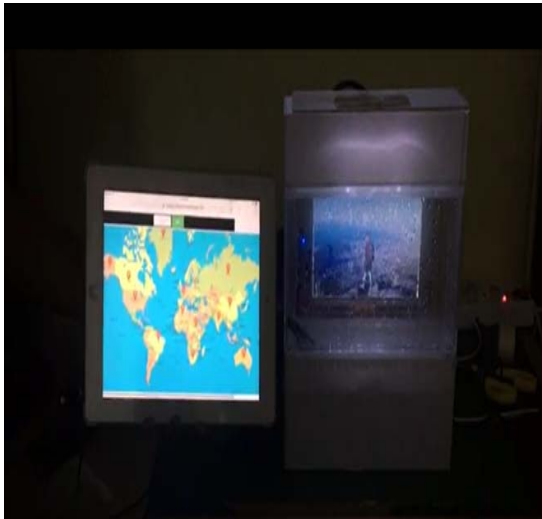**Flow of Events :**

Fig 4: Flow chart

III. Results

Fig 5: For sunny climate condition

Fig 6: For rainy condition

Fig 7: For thunders

Fig 8: Fog condition

IV. Conclusion and Future work:

Weather forecast can be simply seen on mobile using Google or any other way but, this weather forecast using IOT actually creates the weather conditions inside a box which is more effective way of understanding it especially for the people who can't go out to look out and also for students for better understanding. Further, it can be modified by creating each and every weather condition which can also help farmers to create a miniature environment to grow a sample crop and can know the yield of it.

V. References

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