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TALKING PLANT USING IOT AND MACHINE LAERNING

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Abstract - *The aim of this work is to bring the Artificial Intelligent (AI) concept in a new level by introducing it to living organisms like plants. In this system we provide a concrete scenario where an augmented plant, an ePlant can be incorporated in a ubiquitous computing environment in order to work together with other augmented objects, artefacts, in order to provide to the environment status of its condition. Machine learning is the scientific study of algorithms and statistical models that computer systems use to perform a particular task without using explicit instructions, relying on patterns and inference instead. It is recognize as a subset of artificial intelligence. Machine learning algorithms construct a mathematical model depend on sample data, called as "training data", in order to make predictions without being explicitly programmed to perform the task. The system presents the enabling infrastructures that are used to make by using application and sensors, we are creating communication between user and plant. The IoT is the addition of Internet connectivity into physical devices and everyday objects. Embedded with electronics, Internet connectivity, and other forms of hardware (like sensors), these devices can interact with others over the Internet, and they can be remotely examined and controlled.*

Key Words*: *Artificial Intelligence, Eplant, Machine Learning, Internet of Things, Sensors.

1. INTRODUCTION

In this project we create a system so that plant can interact with human easily. In the first part of this IoT project, we will search how to use sensors to collect environment information using Arduino and how to send this information to the cloud. In addition, in the second part of IoT project, we will search how to enable triggers on the sensor values stored. Moreover, we will send alert to user smartphone through Bluetooth or Wi-Fi when some parameter value is out of the range. We can expand this project adding new features so that we can easily combine it with other systems. For example, we can implement a notification system using Firebase so that we can send an alert when some parameters are out of the specified range. Additionally, we could add an Arduino API interface so that we can read the plant status parameters using external systems. Finally, at the end of this IoT project tutorial, you gained, hopefully, the knowledge about reading data sensors and sending the values to the server.

This project describes how to build a smart plant monitoring system that controls the plant health status. This IoT monitoring system checks some environment parameters such as:

- temperature,
- light intensity
- soil moisture

This Smart plant monitoring system based on IoT can be accessed remotely using a browser so that it is attainable to verify the plant health remotely.

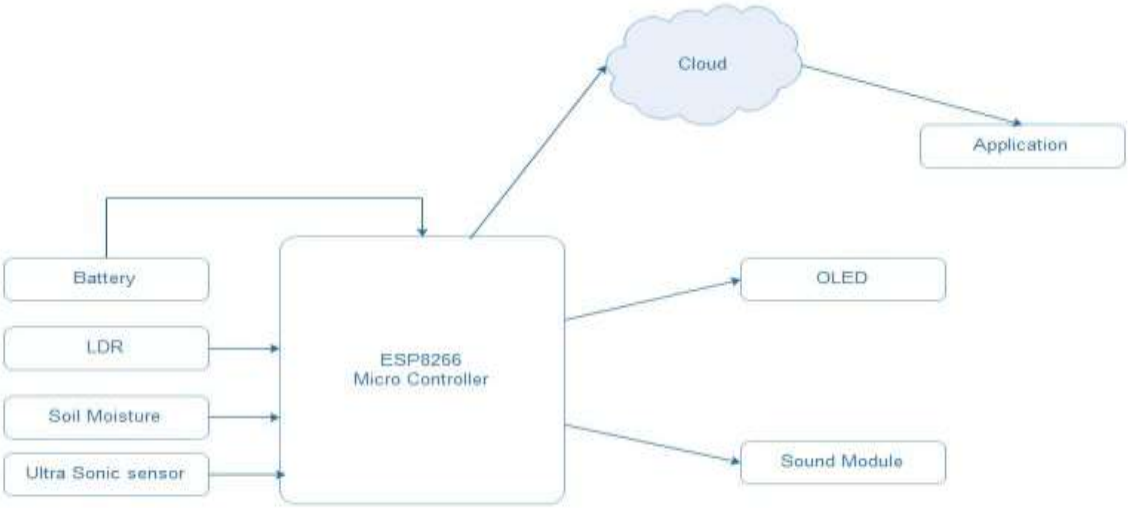
2. PROBLEM DEFINITION

This project mainly focuses on the social behavior of living organism who cannot represent their need what they want and what are the problem they have. This system basically focuses in the field of artificial intelligence through which we can gain knowledge about the behavior of the plant and its responses." The Internet of things (IoT) is the extension of Internet connectivity into physical devices and everyday objects.

3. PROJECT SCOPE

In this system we can add number of different sensor to get more accurate need of the plant and get their responses and we will try to make such a plant who can get their need fulfilled by it self such a watering itself by using a combination of IoT and Machine Learning.

3. SYSTEM ARCHITECTURE



[1] LDR

Light-dependent resistors are simple and low-cost devices. These devices are used where there is a need to sense the presence and absence of light is necessary. The controlling of lights and home appliances is generally operated and maintained manually on several occasions. But the process of appliances controlling may cause wastage of power due to the carelessness of human beings or unusual circumstances. To overcome this problem we can use the light-dependent resistor circuit for controlling the loads based on the intensity of light. The working principle of an LDR is photo conductivity, that is nothing but an optical phenomenon. When the light is absorbed by the material then the conductivity of the material reduces. When the light falls on the LDR, then the electrons in the valence band of the material are eager to the conduction band. But, the photons in the incident light must have energy superior than the band gap of the material to make the electrons jump from one band to another band.

[2] Soil Moisture Sensor

The Moisture sensor is used to measure the water content (moisture) of soil. When the soil is having water shortage, the module output is at high level, else the output is at low level. This sensor reminds the user to water their plants and also monitors the moisture content of soil. It has been widely used in agriculture, land irrigation and botanical gardening. Soil moisture sensors measure the volumetric water content in soil. Since the direct gravimetric measurement of free soil moisture requires removing, drying, and weighing of a sample, soil moisture sensors measure the volumetric water content indirectly by using some other property of the soil, such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for the moisture content.

[3] Ultra Sonic Sensor

Ultrasonic sensors work by emitting sound waves at a frequency too high for humans to hear. They then wait for the sound to be reflected back, calculating distance based on the time required. This is similar to how radar measures the time it takes a radio wave to return after hitting an object.

While some sensors use a separate sound emitter and receiver, it's also possible to combine these into one package device, having an ultrasonic element alternate between emitting and receiving signals. We measure the specific distance from your sensor based on this formula:

Distance = ½ T x C

(T = Time and C = the speed of sound)

[4] Node MCU

Node MCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The term"Node MCU" by default refers to the firmware rather than the development kits. It uses many open source projects, such as luacjson

and SPIFFS. Node MCU was created shortly after the ESP8266 came out. Node MCU started on 13 Oct 2014, when Hong commit- ted the first file of node mcu-firmware to GitHub. By summer 2016 the Node MCU included more than 40 different modules. Due to resource constraints users need to select the modules relevant for their project and build a firmware tailored to their needs.

[5] ESP8266 Micro Controller

This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands. However, at first there was almost no English-language documentation on the chip and the commands it accepted. The very low price and the fact that there were very few external components on the module, which suggested that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, the chip, and the software on it, as well as to translate the Chinese documentation. The ESP8266EX microcontroller integrates a Tensilica L106 32-bit RISC processor, which achieves extra-low power consumption and reaches a maximum clock speed of 160 MHz.

[6] OLED

OLED stands for Organic Light-Emitting Diode. An OLED is simply an LED where the light is produced/ emitted by organic molecules. OLED work in similar way to conventional diodes and LEDs, but instead of using layers of n-type and p-type semiconductors, they use organic molecules to produce their electrons and holes. To make an OLED light up, we simply attach a voltage across the anode and cathode. As the electricity starts to flow, the cathode receives electrons from the power source and the anode loses them. Now we have a situation where the added electrons are making the emissive layer negatively charged, while the conductive layer is becoming positively charged. In that way OLED produces continuous light for as long as the current keeps flowing.

4. ADVANTAGES

- Innovative
- Understanding Plants
- Proper Nourishment of Plants
- Easy to Convey with Human

5. CONCLUSION

Our system is making a drastic change in technology which is transforming the living things who can't express their needs to make them express. Hence our is system is making the new way of communication in which user will directly asked plant what they need, we are overcoming the drawback of existing system.

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