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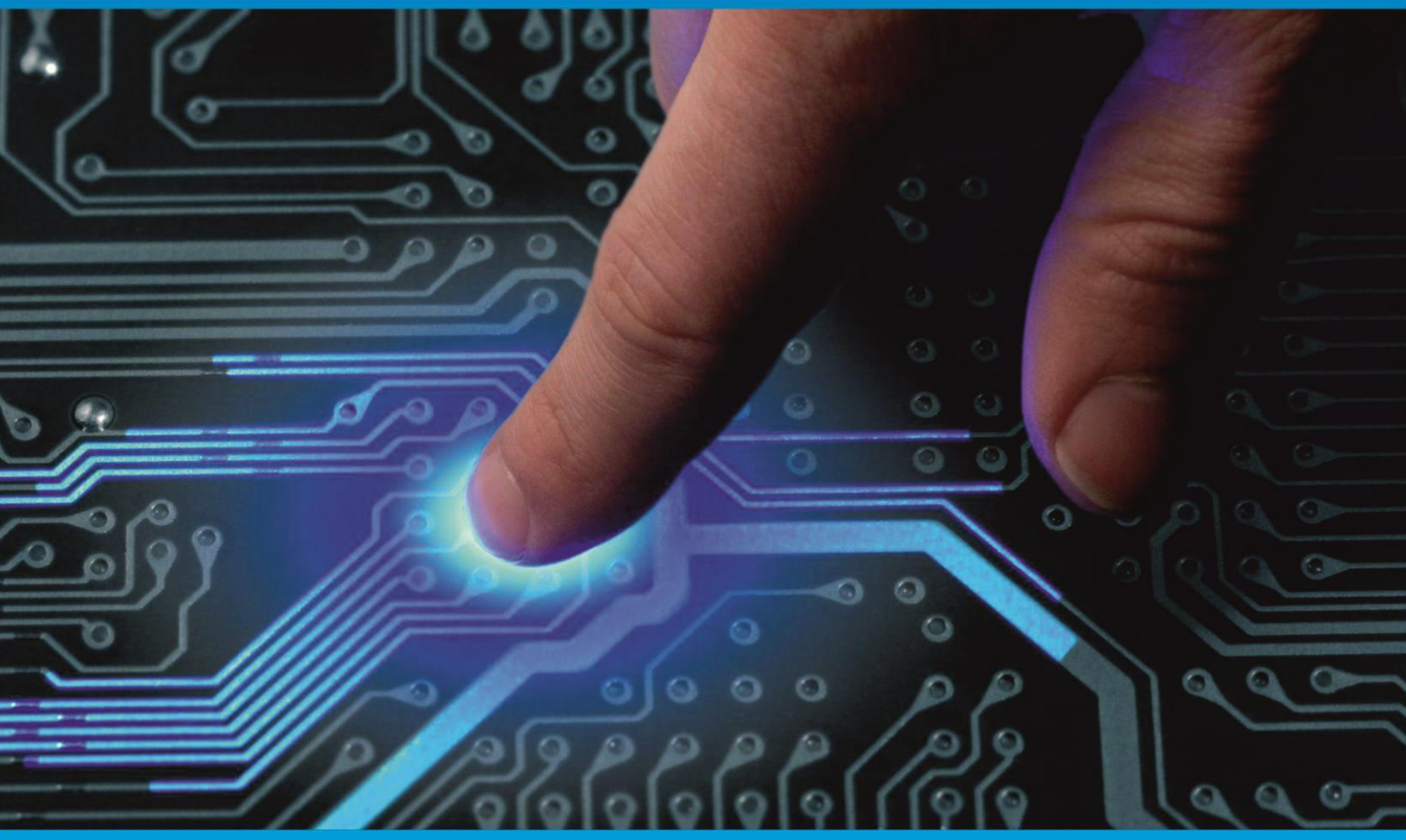

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A Survey on Smart Crop Watering System Using IOT

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ABSTRACT: Agriculture is done in every country from ages. Agriculture is the science and art of cultivating plants. Agriculture was the key development in the rise of sedentary human civilization. Agriculture is done manually from ages. As the world is trending into new technologies and implementations it is a necessary goal to trend up with agriculture also. IOT plays a very important role in smart agriculture. IOT sensors are capable of providing information about agriculture fields. We have proposed an IOT and smart agriculture system using automation. This IOT based Agriculture monitoring system makes use of wireless sensor networks that collects data from different sensors deployed at various nodes and sends it through the wireless protocol. This smart agriculture using IOT system is powered by Arduino; it consists of Temperature sensor, Moisture sensor, water level sensor. . When the IOT based agriculture monitoring system starts it checks the water level, humidity and moisture level. It sends SMS alert on the phone about the levels. Sensors sense the level of water if it goes down, it automatically starts the water pump. If the temperature goes above the level, fan starts. If we want to close the water forcefully on IOT there is button given from where water pump can be forcefully stopped. The proposed system helps in identification of plant disease and provides remedies that can be used as a defense mechanism against the disease. The database obtained from the Internet is properly segregated and the different plant species are identified and are renamed to form a proper database then obtain test-database which consists of various plant diseases that are used for checking the accuracy and confidence level of the project .Then using training data we will train our classifier and then output will be predicted with optimum accuracy. We use Convolution Neural Network (CNN) which comprises of different layers which are used for prediction.

KEYWORDS: IOT, Irrigation, Smart agriculture.

I. INTRODUCTION

Agriculture is major source of income for the largest population in India and is major contributor to Indian economy. In past decade it is observed that there is not much crop development in agriculture sector. Food prices are continuously increasing because crop rate declined. There are number of factor which is responsible for this it may be due to water waste, low soil fertility, Fertilizer abuse, climate change or diseases etc. This project uses IOT technology in agriculture, gathering crops growth Environmental parameters in a fixed place to help farmers find problems in time. Agriculture experts give guidelines with specific information to increase the farmer's income and help them in the prevention and control of crop diseases and pests. Through the custom development of mobile phone apps, it has been implemented with agriculture technology promotion and expert online

The primary occupation in India is agriculture. India ranks second in the agricultural output worldwide. Here in India, farmers cultivate a great diversity of crops. Various factors such as climatic conditions, soil conditions, various disease, etc affect the production of the crops. The existing method for plants disease detection is simply naked eye observation which requires more man labor, properly equipped laboratories, expensive devices, etc. And improper disease detection may led to inexperienced pesticide usage that can cause development of long term resistance of the pathogens, reducing the ability of the crop to fight back. The plant disease detection can be done by observing the spot on the leaves of the affected plant. The method we are adopting to detect plant diseases is image processing using Convolution neural network(CNN). FAQ. The system development composes three parts: The server, Android client and PC client to achieve scalability, high reliability, security, compatibility of technical requirement.

- **Objectives**

1) To provide automated supply of water to crops
2) Provide the exact amount of water to crops

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3) To design such system that can detect crop disease and pest accurately.
4) Create database of insecticides for respective pest and disease.
3) Ensure enough moisture for essential for plant growth

- **Motivation**

Various motivational factors have influenced to script this article as mentioned below. − Among others, the agriculture domain is mostly explored area of concerning the application of IoT in improving the traditional methods of farming. The rapid growth in nanotechnology that took place in last decade has enabled the creation of small and cheap sensors. The self contained nature of operation, together with modular sized hardware platforms, scalable, and cost-effective technologies, has enabled the IoT as a potential tool towards the target of self-organized, decision making, and automation in the agriculture cum farming industry.
In this regard, precision agriculture, automated irrigation scheduling ,optimization of plant growth , farm land monitoring , green-house monitoring and farming production process management in crops, are among a few key applications. However, IoT is in nascent stage of development, hence it has a few limitations such as interoperability, heterogeneity, memory constrained hardware platforms, and security

- **Problem statement**

The agricultural monitoring system is a complex system. Any significant changes in one climate parameter could have an adverse effect on another climate parameter as well as the development process of the plants. Agricultural monitoring installations require a large amount of wires and cables to distribute sensors and actuators. Agriculture fields are most likely far away from central controlling station in which a suitable link
Between field and central station has to be in place in order to effectively monitor and operate remote field station without Physical attendance of human guard.

II. LITERATURE SURVEY

[1] A Simple Integrated Smart Green Home Design, A. D. Asham, Hanaa.M, Bdare Alyoubi Intelligent Systems Conference 2017 7-8 September 2017Smart home systems were introduced to autonomously control appliances, lights and other services based on the current state inside homes. Smart home systems are designed for a wideband of applications such as healthcare, power management, safety and security. In Egypt, we are suffering from an electrical power shortage because the production is not sufficient for the actual consumption. In addition, there are some isolated areas not covered by the National Grid. Because of this persisting challenge, the need for finding solutions arose. Egypt is a developing country with limited resources, consequently economic and power saving focused solutions are needed. In this paper, a simple integrated design of a smart green house is introduced as absolution for a common Egyptian home to save the consumed power from the National Grid. This design has two main pillars: First, a smart system that controls the power consumption through monitoring the activity in the home to save the power as much as possible. This system comprises of a wireless network of controllers. Each controller monitors and controls a specific area considered a separate zone. These zone controllers exchange the current data and control parameters with a master unit, which provides supervision and control of the entire system. In addition, the system can be monitored and configured locally through a wall mounted touch screen or remotely using a mobile phone or web interface. Second, a solar power supply system equipped with a two degree of freedom sun tracker to partially or fully power the loads and hence reduces the power consumption from the National Grid. The solar system is integrated with the smart supervision system through a wireless link to the master unit. [2] Impact of NOx emissions on Climate and Monitoring using Smart Sensor Technology International Conference on Communication and Signal Processing, April 6-8, 2017, India 978-1- K. Sujatha, Nallamilli.P.G Bhavani and R.S.Ponmagal Human resource is of great assert, as it is the gift of nature. Exploitation of human resources should strictly be monitored on health aspects. The power generation sectors in view to increase the combustion quality for enhancing the power production contribute to green house gases which is a threat to human health. The prime aspiration is in detection, recognition and understanding of combustion conditions in power plants ensuring low Nitrogen Oxide (NOx) emissions for protecting the human health from hazardous gases. The colour information from the furnace flame images is the foundation for this scheme. The process of estimating the NOx emissions using a feed forward controller is implemented using Back propagation Algorithm (BPA) and Ant Colony Optimization (ACO). The challenge lies in identification of the 10 attributes used for training the ANN so as to estimate the NOx emissions. The estimation by ANN is termed as intelligent sensors embedded in the computing system to monitor using (IoT). This method proves to be indispensable because this IoT based online monitoring has reduced the percentage of emissions by 19% thereby increasing the combustion quality which has profound effect on human health. [3] Precise Agricultural Greenhouses Based on the IoT and Fuzzy Controlled Dan1, Sun Jianmei1 , Yu

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Yang1 , Xiang Jianqiu1 2016 International Conference on Intelligent Transportation, Big Data & Smart City The greenhouse is designed to recreate an environment where in the temperature, humidity and light are monitored and adjusted to optimize the conditions of plant cultivation. Based on monitoring platform of crop growth environment and information management need of the control agriculture greenhouse, an precision agriculture greenhouse based on IoT and fuzzy was designed. The system uses a fuzzy control which has good control effectiveness in complex and changeable greenhouse system, and ZigBee protocol for wireless communications which makes the system more communication network to send perception layer data to application layer. This system has the characteristics of low cost, simple structure, flexible networking and easy extending, which adapts to the requirements of complex greenhouse control.

III. METHODOLOGY

The sensor is interface with Arduino Uno such as DHT11 Temperature, Humidity, Soil moisture and Rain detection sensor is used. The data acquired from sensors are transmitted to the web server using wireless transmission (WIFI module ESP8266). The data processing is the task of checking various sensors data received from the field with the already fixed threshold values. The motor will be switched ON automatically if the soil moisture value falls below the threshold and vice- versa. The farmer can even switch ON the Motor from mobile using mobile application. The irrigation system automated once the control received from the web application or mobile application. The relays are used to pass control form web application to the electrical switches using Arduino microcontroller. The circuits with low power signal can be controlled using relay the web application will be designed to monitor the field and crops from anywhere using internet connection. To control the Arduino processing IDE is used, the webpage can be communicated using the processing IDE. The mobile application will be developed in android. The mobile application helps to monitor a controlled filed from anywhere.

Preprocessing and Training the model (CNN): The database is preprocessed such as Image reshaping, resizing and conversion to an array form. Similar processing is also done on the test image. A database consisting of about 32000 different plant species is obtained, out of which any image can be used as a test image for the software. The train database is used to train the model (CNN) so that it can identify the test image and the disease it has .CNN has different layers that are Dense, Dropout, Activation, Flatten, Convolution2D, and MaxPooling2D. After the model is trained successfully, the software can identify the disease if the plant species is contained in the database. After successful training and preprocessing, comparison of the test image and trained model takes place to predict the disease.

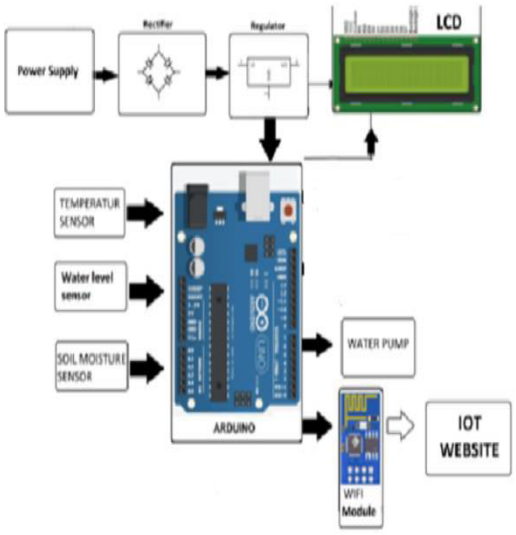

Fig.1.System architecture

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IV. OTHER SPECIFICATION

A.Advantages

1. Easy to use
2. Easy to install
3. User friendly
4. Low cost model

B. Limitations

This system is totally dependent on Sensor network

C.Applications

- Greenhouse
- In open fields
- Non agricultural applications such as golf courses , Residential

V.CONCLUSIONS & FUTURE WORK

Internet on things and cloud computing collectively makes a system that control agriculture sector effectively. This system
Will sense all the environmental parameters and send the data to the user via cloud. User will take controlling action according to that this will be done by using actuator. The proposed system was developed taking in mind the benefits of the farmers and agricultural sector .The developed system can detect disease in plant and also provide the remedy that can be taken against the disease. This asset allows the farmer to improve the cultivation in a way the plant need. It leads to higher crop yield, prolonged production period, better quality and less use of protective chemicals

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