

Certificate of Recommendation

This is to certify that the project entitled “*Automatic Irrigation and Surveillance System with Arduino*” submitted by **Prithwiraj Midya (14800318055)**, **Protyay Basak (14800318052)**, **Joydeep Chatterjee (14800318072)** & **Monalisa Bakshi (14800318064)** is absolutely based upon their own work under the supervision of **Mr. Anupam Patra** (Assistant Professor, Dept of ECE, FIEM) and that neither their thesis has been submitted for any degree/diploma or any other academic award anywhere before.

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Certificate of Approval*

The foregoing thesis is hereby approved as a creditable study of an engineering subject carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite to the degree for which it has been submitted. It is understood that by this approval the undersigned don't necessarily endorse or approve any statement made opinion expressed or conclusion drawn therein but approve the thesis only for the purpose for which it is submitted.

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Acknowledgement

It is a great pleasure to express my deepest gratitude and indebtedness to my internal guide, **Mr. Anupam Patra**, Assistant Professor, Department of Electronics and Communication Engineering, Future Institute of Engineering & Management, Kolkata for his supervision, constant help and encouragement throughout the entire period.

We are very much grateful to **Prof. (Dr.) Dipankar Ghosh**, Head of the Department, Professor, Department of Electronics and Communication Engineering, Future Institute of Engineering & Management, for necessary suggestions and helpful scientific discussions to improve the quality this thesis.

We are also thankful to the all-faculty members and technical staff of the department for their help whenever we needed it.

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ABSTRACT

As irrigation is the main part of agriculture, labour saving and water saving technology is the key issue in irrigation. Microcontroller based automatic plant irrigation system allows a simple and low-cost method for irrigating. In the proposed system we have three sensors that are soil moisture, Humidity, and temperature Sensors for irrigation purposes and to control the agricultural Parameters. When any of these sensors generates a low signal, the controller enables the corresponding motor to turn on and supply water to the field and display the status of sensors in the mobile handset via Bluetooth. Bluetooth is used to communicate with the user about the exact field condition. nRF Sensor is used to communicate between two Arduino devices. The Soil Moisture Sensor checks the moisture content in the soil with the help of a probe inserted in the soil at the plant. The value is generated by short circuiting of two probes in the soil. The DHT sensor calculates the humidity and the temperature of the field and using the nRF sensor it sends the values to the Arduino Mega.

An ESP32 Cam is used for surveillance of the field. It sends the live feed via Wi-Fi. This system introduces an automatic irrigation system by using an Arduino Nano and Mega controller. For wireless communication Bluetooth is used between famer handset and the system which transmits status of sensors. Soil moisture sensor gives information about moisture level of the soil which will then transmit to the mobile unit through Bluetooth module.

INTRODUCTION

In the present era, the greatest problem faced by the world is scarcity of water. In India agriculture is an occupation demanding cultivation land as supplementation of rain fall. There are various types of the irrigation system that have been adopted. The efficiency of the irrigation system in conserving water is not appreciable. Moreover, the water requirement by the crop depends on the type of soil, crop and environmental parameters like temperature and humidity. Conventional Irrigation systems either result in over irrigated or under irrigated land. As growth and development of plants is prevented due to scarcity of water, similarly excessive water has adverse effects on growth and development of plants. Under conventional irrigation systems, many parts of irrigated fields are over or under irrigated due to variability in the water holding capacity of land, water infiltration and water runoff. Over irrigated areas suffer from poor plant health due to increase in salinity. Excessive water replaces air in pores of the soil and roots of the plants do not get sufficient air. Hence efficient water management plays a key role in agriculture. An automated irrigation system refers to the operation of the system with no or just a minimum of manual intervention beside the surveillance. Almost every system (drip, sprinkler, surface) can be automated with help of timers, sensors or computers or mechanical appliances. It makes the irrigation process more efficient and workers can concentrate on other important farming tasks. An automatic irrigation system does the work quite efficiently and with a positive impact on the place where it is installed. Once it is installed in the agricultural field, the water distribution to crops and nurseries becomes easy and doesn't require any human support to perform the operations permanently. Sometimes automatic irrigation can also be performed by using mechanical appliances such as clay pots or bottle irrigation system. It's very hard to implement irrigation systems because they are very expensive and complex in their design.