IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

ISO 3297:2007 Certified ⁜ Impact Factor 8.066 ⁜ Peer-reviewed / Refereed journal ⁜ Vol. 10, Issue 6, June 2023

DOI: 10.17148/IARJSET.2023.10678

AUTOMATIC PLANT WATERING SYSTEM

Sanjana G[1], Sanjana T G[2], Sumana N[3], Vaishnavi A[4]

Student, ECE, KSIT, Bengaluru, India[1-4]

Abstract: In recent years, there has been an increasing focus on the development of autonomous systems to assist in Automatic Plant Watering System, particularly in Agriculture fields. The abstract presents an overview of an Automatic Plant watering system which is created successfully and efficiently to automate the process of watering plants in varied settings. This approach tries to overcome the difficulties of maintaining plants' ideal moisture levels, particularly in circumstances when manual watering might not be practical or reliable. This system has essential parts like sensors, control unit, actuators. To gauge the soil's moisture level, soil moisture sensors are placed in the root zone of the plant. Real-time data from these sensors is sent to the control unit for analysis and decision-making.

Keywords: Arduino UNO, DC water pump, LCD, Motor drivers.

I. INTRODUCTION

As we all know, India can be called as the backbone of Indian Economic System, because two third of the Indian population is engaged in cultivation of land. But now a days we can observe that in many Agriculture sectors they face water wastage as a major crisis. The main reason for this problem is unplanned use of watering which leads to significant amount of water. This issue can be rectified if we use Automatic plant watering system in which watering will take place only if there is a need of irrigation, which is a smart and efficient way of watering.

Manual watering is a time consuming task and unpredictable task when it comes dealing with lots of Plants in the field, or in circumstances where we cannot give constant attention in watering. In order to produce a clever and automated watering system, the Automatic Plant Watering System harnesses the power of sensors, control systems, and actuators. To measure the soil's moisture content, the system makes use of soil moisture sensors that are positioned carefully in the plant's root zone. Real-time data from these sensors is sent to a centralised control unit for analysis and decision-making. The system can be improved with additional capabilities to offer comprehensive plant care in addition to its primary operation of automated watering. For instance, temperature and humidity sensors can be used to keep track of the environment and modify the watering schedule as necessary. The provision of vital supplements to the plants through the integration of nutrient delivery methods can further optimise their growth and wellbeing.

II. LITERATURE SURVEY

[1] Abhishek Gupta, Shailesh Kumawat & Shubham Garg, It uses the microcontroller PIC16F877A, which is managed by the microcontroller 8051. Timer circuit, a crystal oscillator operating at 3.75 MHZ, and related issues are addressed. Power requirements are frequently a key factor. Conditions with high temperatures or strong winds will reduce the effectiveness of watering. Thus, creating a steady circuit is necessary.

[2] Ahmed Imteaj , Tanveer Rahman, Mohammed Shamsul Alam and Touhidul
Alam, have concluded Automated Watering System for Small Plants to accomplish a sensor-based automatic irrigation system that is integrated to the microcontroller, Arduino, Sensors, and is low-cost and energy-effective. They lack an automatic alerting system and the ability to predict the optimal time to water.

[3] Maria Beata Inka Astutiningtyas, Monika Margi Nugraheni, Suyoto[3]
Automatic Plants Watering System for Small Garden has been investigated and analysed. Wireless networks and sensors are used in the Internet of Things (IoT). IoT gives users additional flexibility and freedom when controlling objects remotely. The main problem with this is, it is pricey and equipment upkeep is intensive.

[4] Mani bansal, Abhay Pandey, Mandvi Singh, Nivesh Sharma, Ms Neha
Have given the basic idea of Automatic Watering of Plants using an Arduino UNO and an ATMEGA microcontroller to gather input signals from sensors that detect the moisture content of the soil. They made use of soil moisture and humidity sensors. According to the author, the drawbacks include continuous, uncontrolled water flow that lowers agricultural output and requires expensive maintenance to keep machinery in good operating order.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

ISO 3297:2007 Certified ⁜ Impact Factor 8.066 ⁜ Peer-reviewed / Refereed journal ⁜ Vol. 10, Issue 6, June 2023

DOI: 10.17148/IARJSET.2023.10678

[5] Mritunjay Ojha, Sheetal Mohite, Shraddha Kathole, Diksha Tarware, this paper discusses an automatic plant watering system that uses a microcontroller and was created by combining the features of all the hardware components employed. They have made use of sensors including moisture, temperature, pH, and humidity sensors. However, this method requires human adjustment and setting of the sprinkler.

III. PROPOSED SYSTEM

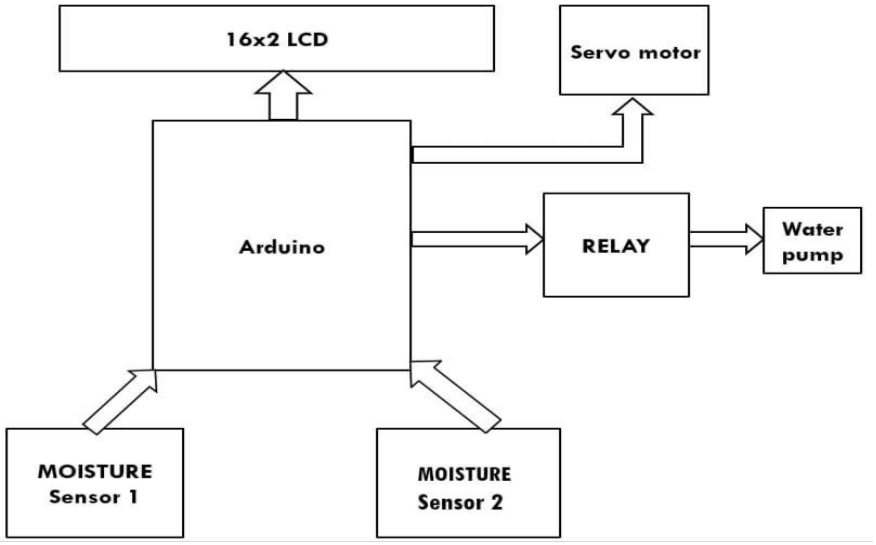
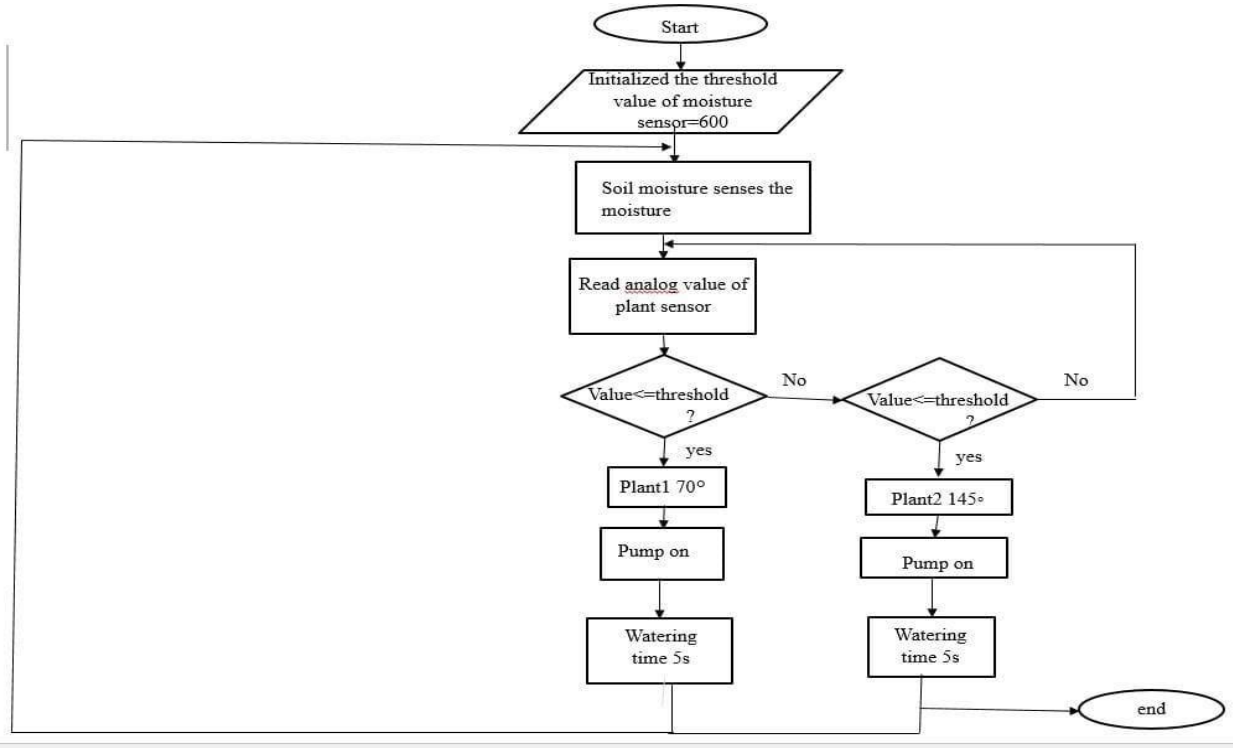


Fig 1. System block diagram

This system works accordance with the moisture sensors. The Arduino takes moisture level as input signals from moisture sensors. The control unit receives the soil moisture measurement from the sensors. The control unit analyses the data, establishes the watering needs, and turns on the actuators to supply the plants with water. The system's functionality is ensured by the power supply.

IV. FLOW CHART



IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

ISO 3297:2007 Certified ⁜ Impact Factor 8.066 ⁜ Peer-reviewed / Refereed journal ⁜ Vol. 10, Issue 6, June 2023

DOI: 10.17148/IARJSET.2023.10678

V. METHODOLOGY

1. System Design and Planning: Identify the goals and specifications for the automatic plant watering system, taking into account the type of plant, the environment, and the preferred moisture levels. Based on the system requirements, choose the appropriate sensors, actuators, control unit, water supply, and power supply.
2. Installing the sensors in the soil at the suitable depths, making sure that the root zone is properly in contact with them. Set up accurate baseline measurements for various moisture levels by calibrating the sensors.
3. The moisture sensor measures the soil's moisture content, and when it detects a low level, it automatically activates the water pump and irrigates the plant using a microcontroller.
4. After providing enough water, the soil begins to hold the moisture, which causes the pump to shut off automatically.

VI. HARDWARE IMPLEMENTATION

- Arduino UNO- Board
- 9-volt DC Motor pump
- Water container
- Soil moisture sensor
- Small flexible water pipe
- 9V battery
- LCD
- Jumper wires
- Software used- Arduino Integrated Development Environment (or) Arduino software (IDE**)**

VII. CONCLUSION

By automating the watering process and ensuring that plants have the ideal moisture levels, the Automatic Plant Watering System revolutionises plant care. It provides a dependable and sustainable solution for plant care in a variety of applications because to its cutting-edge technology, customization choices, and water usage economy. By implementing this approach, people and organisations can improve plant health, simplify maintenance tasks, and help create a more sustainable and effective environment**.**

VIII. FUTURE SCOPE

Integration with smart home system and autonomous smart gardens.

Water Quality Management: By incorporating capabilities for monitoring and controlling water quality, the system may assist guarantee that plants receive water of the highest possible standard.

REFERENCES

[1] Mani Bansal, Abhay Pandey, Mandvi Singh, Nivesh Sharma ,Student, Department of Computer Science and Engineering ,Raj Kumar Goel Institute of Technology Ghaziabad, India .Ms Neha-Department of Computer Science and Engineering, Raj Kumar Goel Institute of Technology, Ghaziabad, India.

[2] Mritunjay Ojha, Sheetal Mohite, Shraddha Kathole & Diksha Tarware, Department of Computer Science, F.C.R.I.T Vashi, Mumbai, India.

[3] Maria Beata Inka Astutiningtyas, Monika Margi Nugraheni, Suyoto, Universitas Atma Jaya Yogyakarta, Yogyakarta, Indonesia.

[4] Abhishek Gupta , Shailesh Kumawat & Shubham Garg,Sr. lecturer, Department of EEE, SKIT Jaipur, India B.Tech, Department of EE, SKIT Jaipur, India.

[5] Ahmed Imteaj, Tanveer Rahman, Mohammed Shamsul Alam, and Touhidul Alam Department of Computer Science and Engineering, International Islamic University Chittagong, Chittagong, Bangladesh.

