A Survey on Automated Plant Watering System using Aurduino Uno

Mr. Rahul Kanade[1], Mr. Tushar Sagalgile[2], Mr. Ganesh Gitte[3], Mr. Sanket Mahandule[4], Mr. Krushna Borude[5]

Department of Computer Engineering[1,2,3,4,5]

Adsul Technical Campus Chas, Ahmednagar, India

Abstract*: Automatic plant watering systems are devices that can water plants automatically based on the soil moisture level, without human intervention. They can reduce water consumption, improve plant growth, and save time and labor. In this paper, we present the design and implementation of an automatic plant watering system using Arduino Uno, a low-cost and easy-to-use microcontroller board. We use a soil moisture sensor, a water pump, a relay, and a circuit to connect them with the Arduino Uno. We write a software code to program the Arduino Uno to read the soil moisture level and control the water pump accordingly. We test and evaluate our system on different plants and soil types, and measure the soil moisture level, the water consumption, the plant growth, and the system performance. We find that our system can water the plants effectively and efficiently, and achieve a high accuracy and reliability. We also discuss the benefits, challenges, and limitations of our system, and suggest some future work and improvements. Our work can provide a useful reference and guidance for anyone who is interested in building an automatic plant watering system using Arduino Uno.*

Keywords: Microcontroller, Arduino uno, Soil moisture sensor

I. INTRODUCTION

Water is a vital resource for life and agriculture, but it is also a scarce and unevenly distributed resource. there is a need for efficient and sustainable irrigation methods that can reduce water consumption, improve crop yield, and save time and labor. In this paper, we present a survey on a system which will helps to avoid water wastage as well as exterminate the need of labor force. In this paper, we present a survey on automatic plant watering system using Arduino Uno, a low-cost and easy-to-use microcontroller board that can be programmed to perform various tasks. Arduino Uno is a popular and widely used platform for hobbyists, students, and researchers who want to create interactive projects or prototypes. Arduino Uno can be interfaced with various sensors, actuators, and modules to build an automatic plant watering system that can sense the soil moisture level and control the water pump accordingly. We also use a soil moisture sensor, a water pump, a relay, and a circuit to connect them with the Arduino Uno. We write a software code to program the Arduino Uno to read the soil moisture level and control the water pump accordingly.

II. LITERATURE SURVEY

Automatic plant watering systems are devices that can water plants automatically based on the soil moisture level, without human intervention. They can be used for various applications, such as indoor gardening, outdoor landscaping, greenhouses, farms, or big agriculture fields. Automatic plant watering systems can offer several benefits, such as saving water, enhancing plant growth, preventing overwatering or underwatering, avoiding soil erosion or salinization, and reducing human errors or efforts. However, designing and implementing an automatic plant watering system is not a trivial task. It involves various aspects, such as hardware components, software code, sensors, actuators, power supply, communication, and control. In this literature survey, we review the existing works or studies on automatic plant watering system using Arduino Uno, a low-cost and easy-to-use microcontroller board that can be programmed to perform various tasks. Arduino Uno is a popular and widely used platform for hobbyists, students, and researchers who want to create interactive projects or prototypes. Arduino Uno can be interfaced with various sensors, actuators, and

IJARSCT

ISSN (Online) 2581-9429

International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)

International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal

Impact Factor: 7.53

Volume 4, Issue 2, February 2024

modules to build an automatic plant watering system that can sense the soil moisture level and control the water pump accordingly.

III. SYSTEM OVERVIEW

The automatic plant watering system using Arduino Uno is a device that can water plants automatically based on the soil moisture level, without human intervention. The system aims to reduce water consumption, improve plant growth, and save time and labor. The system consists of the following hardware components:

Arduino Uno: This is a low-cost and easy-to-use microcontroller board that can be programmed to perform various tasks. It is the brain of the system and controls the other components.

Soil moisture sensor: This is an analog capacitive sensor that measures the soil moisture level by capacitive sensing. It is the input of the system and triggers the water pump.

Water pump: This is a DC submersible pump that delivers water to the plant. It is the output of the system and is controlled by the relay.

Relay: This is a mechanical switch that turns the water pump on or off. It is the interface between the Arduino Uno and the water pump and isolates them from the high voltage or current.

Circuit: This is the connection between the Arduino Uno, the soil moisture sensor, the water pump, and the relay. It provides the power supply and the signal transmission for the system.
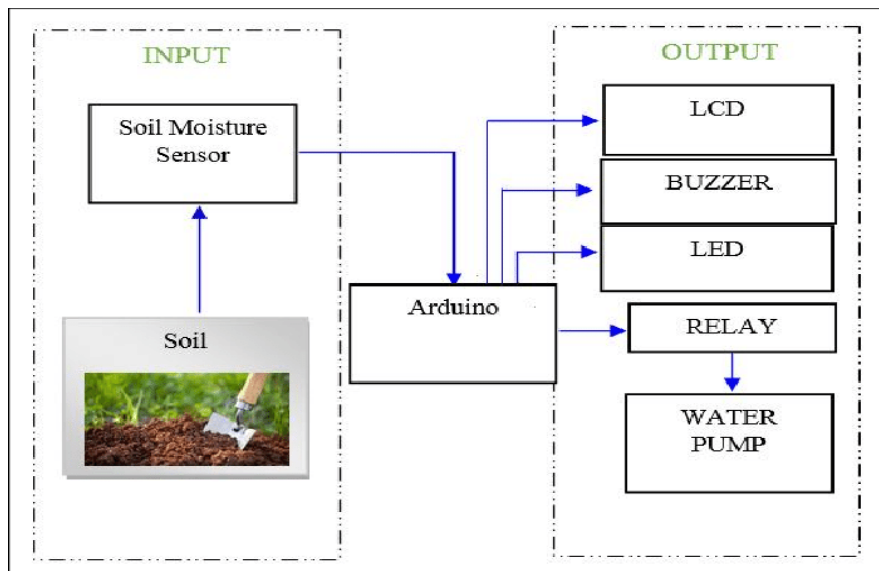
IV. SYSTEM ARCHITECTURE

Fig: System Architecture of Automated Plant Watering System using Aurduino Uno.

V. CONCLUSION

In this paper, we presented a survey on automatic plant watering system using Arduino Uno, a low-cost and easy-to-use microcontroller board that can be programmed to perform various tasks. The main goal of this paper was to provide a comprehensive and systematic review of the existing literature on automatic plant watering system using Arduino Uno, and to identify the current trends, challenges, and future directions in this field.

VI. ACKNOWLEDGEMENT

REFERENCES

[1]. Khan Shifa, T. (2018). Moisture sensing automatic plant watering system using Arduino Uno.American Journal of Engineering Research, 7(7), 326-330[1].

[2]. Nasir, S. Z. (2021). Automatic plant watering system using Arduino. The Engineering Projects[2]

[3]. Kolo, J. G., & Kolo, A. J. (2017). Design and implementation of automated plant watering system using Arduino. International Journal of Computer Science and Engineering, 5(4), 1-6[3]

[4]. Kumar, S., & Singh, A. (2018). Automatic plant watering system using Arduino. International Journal of Innovative Research in Technology, 5(2), 1-4[4].

[5]. C.M. Devika, Karthika Bose, S. Vijayalekshmy,"Automatic plant irrigation system using Arduino", Dec. 2017.

[6]. Abhinav Rajpal, Sumit Jain, Nistha Khare and Anil Kumar Shukla, ''Microcontroller based Automatic Irrigation System with Moisture Sensors", International Conference on Science and Engineering, 2011, pp. 94-96.

[7]. "Arduino Programming step-by-step guide to master Arduino hardware and software" Second Edition by Mark Torvalds in the year 2018.

[8]. "Arduino Based Automatic Plant Watering System", S. V. Devika, S.k.Khamuruddeen, Sk.Khamurunnisa, Jayanth Thota, Khalesha Shaikh, Associate Professor, Dept. of ECE, HITAM,Hyderabad, India, MSC 2nd Year, Department Of Electronics, HRD, Hyderabad, India.

[9]. Hercog D and Gergic B 2014 "A Flexible Microcontroller-Based Data Acquisition Device," Sensors 14 9755-9775.

[10]. PROPOSED AUTOMATED PLANT WATERING SYSTEM USING IOT Kritika Shah* , Saylee Pawar, Gaurav Prajapati, Shivam Upadhyay and Gayatri Hegde (PCE, New Panvel, India, Affiliated to University of Mumbai).

[11]. VeenaDivyak ,AyushAkhouri,A Real time implementation of a GSM based Automated Irrigation Control System using drip IrrigationMethology(Volume 4, Issue 5,May 2013).

[12]. Suraj S.Avatade, Prof.S.P. Dhanure, "Irrigation System Using a Wireless SensorNetwork and GPRS", International Journal ofAdvanced Research in Computer and Communication Engineering, Vol. 4, Issue 5, May 2015.

[13]. Madhu Vanthi," Arduino Based Smart Irrigation System", International Journal of Advanced Research in Computer and Communication Engineering. (Vol. 7, Issue 3, March 2018).

Copyright to IJARSCT
www.ijarsct.co.in

DOI: 10.48175/568

ISSN
2581-9429
IJARSCT

290