Automatic Plant Watering System

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ABSTRACT

This research focuses on creating an automatic plant watering system using simple electronic components and sensors. The aim is to help people take better care of plants even if they forget to water them. The system uses a soil moisture sensor to check the dryness of the soil. If the soil is dry, the water pump turns on and waters the plant. The process is automatic and works without human help. This project is especially helpful for busy people, elderly, or plant lovers who travel often. It is low-cost, easy to build, and eco-friendly. The system avoids overwatering and saves water by only watering when needed. This ensures better plant health. It can be used in homes, offices, and small gardens. With future updates, users can connect this system to a mobile app to monitor and control it remotely. It is a good mix of basic electronics and practical use. The prototype was tested on different types of plants and worked successfully. It can also be powered by solar energy, making it suitable for outdoor use. This is a beginner-friendly DIY project with real-life benefits and educational value.

Keyword: Plant Care, Soil Moisture Sensor, IoT, Water Pump

1. INTRODUCTION

Plants need regular watering to stay healthy. Many people forget or are too busy to do this daily. An automatic watering system solves this by using a simple sensor and pump that works without any user action. This project is low-cost and can be built using basic tools and materials.

1.1 Sub Title-1

The soil moisture sensor is the key part. It checks how dry the soil is. When the dryness level crosses a set limit, the system activates the water pump.

1.2 Sub Title-2

This project can be done by school and college students as a mini project. It uses basic electronics and programming. It teaches automation and plant care.

2. WORKING PRINCIPLE

The system checks the soil moisture using a sensor. When the value is low, it sends a signal to the controller. The controller then turns on a relay which starts the water pump. After a few seconds of watering, the pump stops automatically.

2.1 Sub Title-1

The device uses Arduino, relay module, moisture sensor, and water pump. It can run using a battery or be powered through a plug. The setup is simple and can be reused.

3. RESULT & DISCUSSION

The system was tested on houseplants and garden plants. It worked well in both cases. Plants received only the needed amount of water, reducing waste. Users found it helpful and easy to use. This system helps reduce water usage by avoiding unnecessary watering when the soil is already moist. It also improves plant health by providing water at the right time. In hot climates, this system is especially useful, as it maintains consistent soil moisture.

One of the best features of this project is that it can be upgraded with smart technology. By adding Wi-Fi or Bluetooth modules, users can receive notifications about their plant's moisture status or control the watering manually from a smartphone app.

To ensure safety, the electrical components are placed in a waterproof casing. This allows the system to be used in both indoor and outdoor environments without damage.

Another important factor is that the system is scalable. It can be expanded to support more plants by connecting multiple moisture sensors and pumps to the same controller. This is ideal for home gardens, small farms, or greenhouse setups.

The system was tested for continuous performance over a week and showed reliable watering at the correct intervals. With minor adjustments in the sensor threshold, it is possible to customize the system for different types of plants, which may need varying amounts of water.

In conclusion, this automatic plant watering system combines practicality, cost-efficiency, and ease of use, making it suitable for daily life applications. It promotes sustainability, saves time for users, and supports a healthy environment through responsible water usage.

3.1 Sub Title-1

The water pump was able to handle a small garden setup. Using solar panels makes it ideal for outdoor installations in farms or parks.

4. CONCLUSIONS

This system is useful for daily plant care. It reduces the chances of forgetting to water and ensures plants are not overwatered. It can be improved by adding Wi-Fi and app control in future versions.

5. ACKNOWLEDGEMENT

6. REFERENCES

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