

ISSN: 2508-7894 © 2013 KAIA. <http://www.kjai.or.kr>

Doi: <http://dx.doi.org/10.24225/kjai.2013.1.1.4>

Auto plant control system by using Arduino

¹ Deb Chowdhury

¹, First Author Technical Program Management (R&D), Allied Telesis, Inc, San Jose, CA, USA.

E-mail: dhiman.chowdhury@yahoo.com.

Received: January 23, 2013. Revised: February 10, 2013. Accepted: March 15, 2013.

Abstract

In the era of information society, IT industry has been developed very much. New technology has made appearance in citizens' lives. IOT (Internet of Things) has grown up the most rapidly in IT industry. Kevin Ashiton, MIT specialist, said, "Loading of FRIS and other sensors shall build Internet of things." Internet of things is said to let things have sensor and communication module and to exchange information and communicate each other. In this study, Internet of things has been applied to flowerpot to build automatic flowerpot control system that turns fan ON and supplies water depending upon temperature and moisture. Users are difficult to cognize temperature and humidity of flower pot correctly. In this study, an experiment obtained correct value of temperature and humidity to build control system. At the performance test of flower pot, commands turned ON depending upon temperature and humidity. Control system should be added to control water supply quantity and time objectively according to servo motor control. Purpose of further study was to control flower pot by remote system in connection with smart phone application. An application control can make not only temperature and humidity statistics but also server depending upon users' needs to turn fan ON and take actions and to control flower pot.

Keywords: New technology, sensor, Arduino, communication module.

1. Introduction

In the era of information society, IT industry has been developed very much. New technology has made

appearance in citizens' lives. IOT (Internet of Things) has grown up the most rapidly in IT industry. Kevin Ashiton, MIT specialist, said, "Loading of FRIS and other sensors shall build Internet of things." Internet of things is said to let things have sensor and communication module and to exchange information and communicate each other. In this study, Internet of things has been applied to flowerpot to build automatic flowerpot control system that turns fan ON and supplies water depending upon temperature and moisture.

2. Associated studies

2.1. Arduino

Arduino is an electronic platform of hardware and software of IDE to record software for physical computer platform and board. Arduino is given input from switches and/or sensors to develop communication entity that controls lighting, motor and other physical outputs. Arduino is inexpensive than other micro platform to simplify micro controller operation and to give users advantage. In this study, Arduino Uno version has been used.

2.2. Soil moisture sensor and temperature sensor

You put soil moisture sensor into the soil vertically to test soil water content of the plant and to print out moisture by using code. Server motor runs for a certain time to give outcome automatically below than set value of the water.

The temperature sensor of DHT11 model measures relative humidity and temperature. In this study, soil moisture sensor was used to measure soil moisture and to print out temperature by using DHT11. Temperature has an error of 2°C and humidity has that of ±5%.

Fan motor turns ON to lower temperature below than set value. And, LED turns ON higher than set value.

3. System Design

Firizing, Arduino circuit design program, was used to make design of circuit and to be prototype of automatic plant control system. Soil moisture sensor was added to make use of fan motor instead of DC motor. And, servo motor was used to control water supply.

4. Performance

LCD screen displays temperature and soil moisture by DHT11 sensor and soil moisture sensor. LCD

display in size of 16*2 was used. A part of the program code has been shown below:

Plant temperature of 18~23°C was set in advance. Fan motor turns ON when temperature exceeds 23°C, and LEB bulb turns ON to raise temperature when temperature is below than 18°C. Servo motor turns ON during specific time to supply water when humidity is below than 40°C.

5. Conclusion

Users are difficult to cognize temperature and humidity of flower pot correctly. In this study, an experiment obtained correct value of temperature and humidity to build control system. At the performance test of flower pot, commands turned ON depending upon temperature and humidity. Control system should be added to control water supply quantity and time objectively according to servo motor control. Purpose of further study was to control flower pot by remote system in connection with smart phone application. An application control can make not only temperature and humidity statistics but also server depending upon users' needs to turn fan ON and take actions and to control flower pot.

References

- Daiko Industry Research Institute (2010). *Rapid Growing Location Based Services (LBS) and Augmented Reality Technology, Market and Business Trends*. Saint Deiko Publishing Co.
- Seo, Min Woo (2013). *Create 45 projects with Android*. Anthurbook
- Wikipedia (2011). *Android*. Retrieved May 22, 2011, from [Https://en.wikipedia.org/wiki/ Android](https://en.wikipedia.org/wiki/Android),
- Bray, Jennifer (2001). *Bluetooth*. HONG LONG SCIENCE PRESS