International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 05 Issue: 12 | Dec - 2021 ISSN: 2582-3930

REVIEW ON A MOBILE GREENHOUSE ENVIRONMENT MONITORING SYSTEM BASED ON THE INTERNET OF THINGS

Vijaya Uttamrao Sasemahal [1], **Dr. U. B. Shinde** [2], **Prof A. T. Jadhav** [3]

[1,2,3] *Department of Electronics and Telecommunication CSMSS's CHH. Shahu College of Engineering, Aurangabad, India.*

Abstract— In this paper, the wireless robot refers to the mini robot which live aqueducts the monochromic videotape, takes and stores the images. The robot is being controlled through a original Wi-Fi garcon by a compatible web runner. We've used two Android phones in the proposed system for the purpose of videotape streaming and audio transfer. Node MCU ESP Module, to incorporate wireless connectivity in the proposed system. This paper also proposes the robotization using internet of effects in green house terrain and employing the detectors for the seeing the temperature and moisture, to enhance the product rate and minimize the discomfort caused to the growers.

Keywords: Environmental monitoring, greenhouse, Internet of Things, mobile system, dht 11, co2 sensor, lux meter.

1. INTRODUCTION

The most important factors for the quality and productivity of plant growth are temperature, moisture, and light. Nonstop Monitoring of these environmental variables provides precious information to the farmer to more understand, how each factor affects growth and how to maximize crop productiveness. The optimal hothouse semipro climate adaptation can enable us to ameliorate productivity and to achieve remarkable energy savings especially during downtime in northern countries. WSN is composed of hundreds of bumps that have the capability of seeing, Actuation, and communication have great advantages in terms of high delicacy, fault forbearance, inflexibility, cost, autonomy, and robustness compared to wired bones. Also, with the onset of IoT and M2M dispatches, it's poised to come to a veritably significant enabling technology in numerous sectors, like service, terrain, health, home, and other marketable areas. IoT is a general term, covering a number of technologies that allow bias to communicate with each other, with or without mortal intervention. An illustration operation, presented in this paper, is the mobile-grounded hothouse operation, which in a timely manner provides a possibility for screen monitoring of detailed data about the conditions of the hothouse. Likewise, the suggested setup can be incorporated with other internet communication for growers.

2. LITERATURE REVIEW

The mobile greenhouse terrain covering system proposed in this study is grounded on IoT armature. Following the development of IoT technology, its armature is getting decreasingly formalized. Compared with other environmental monitoring systems grounded on IoT infrastructures, the system proposed in this study is characterized by its mobility, and the stir of the outfit itself in the hothouse needs to be well controlled. [1] The main function of the perceptual sub caste is to gain the temperature, moisture, illumination, carbon dioxide attention and of the crop. By realizing control of the lower computer, the control sub caste is responsible for the automatic shadowing in the greenhouse. It also directly determines the position of each data accession point. [2]It also controls the data accession mode and format, and converts and encapsulates some data at the perceptual sub caste. The transmission sub caste completes the dependable transmission of data between the perceptual sub caste and the garcon, and develops applicable protocols to ameliorate data quality. The main function of the operation sub caste is to apply all stoner-acquainted operations similar as data processing, data storehouse, data operation, vaticinators and early warning, service decision making etc. [3]

The current hothouse data accession system is enforced in the way that data accession terminal uploads data to the host computer to manage the data or transfer them to pall garçon. The network structure is fairly complex and the power consumption is large. In order to break the below problems, a hothouse terrain monitoring and temperature vaticination system was developed by using the Internet of Effects, pall services and We Chat platform. In this system, the data collection terminal directly connected the Internet to the pall garcon through Wi-Fi/ GPRS to interact with the data, and the mobile terminal penetrated the pall garcon to gain the data service through the We Chat public number. [4]

The temperature soothsaying model espoused the discrimination time series model to break the influence of seasonal periodicity in the temperature vaticination process. The data analysis showed that the system effectively realized the feather light and mobility of the data accession outstation. The relative error of temperature monitoring was lower than4.96, and the relative error of temperature vaticination was lower than 3. [5]

The methodology proposed in the paper applies artificial intelligence (AI) ways to the modeling and control of some climate variables within a hothouse. The nonlinear physical sensations governing the dynamics of temperature and humidity in analogous systems are, in fact, delicate to model and control using traditional ways. The paper proposes a frame for the development of soft computing- predicated controllers in modern greenhouses (6).

In recent times, a wireless sensor network (WSN) fashion was considerably applied in the field of husbandry, which detects, senses, and collects information of various surroundings or objects in the network area, and at the same time sends and receives data through wireless and tone- organizing multi-hop routing links. Due to the complexity of the agricultural terrain and various factors like walls, downfall condition, structure, paraphernalia, and the layout of installation husbandry that all affect the WSN communication quality, wireless sensor networks adapt dissimilarly to agricultural terrain. Thus, how to achieve the swish networking to different agricultural terrain conditions, minimize the cost and energy consumption, and meliorate the performance of the network transmission turn out to be the pivotal issue in the studying of agricultural wireless sensor networks (7).

The work is executed for remote monitoring and control of hothouse parameters with the help of sensors and GSM communication. It overcomes the disadvantages of wired and wireless constraints analogous as complicated wiring, delicate conservation and distance, to cover and control the operations. The operation will have bedded system which consists of ARM7 microcontroller, real time operating system, sensors, GSM modem, and control bias to cover the environmental parameters condition videlicet temperature, humidity, CO 2 attention and light intensity in a hothouse (8). By this, environmental parameters in hothouse can be covered and controlled manually as well as ever. The attack and software modules of the operation system are mooted in detail. This bedded operation is executed and tested for its correct functionality. The experimental results show that the developed monitoring system has the following features, analogous as simple structure, high responsibility, good extensibility and flexible configuration (9).

Ref No	Control System	CO2 (PPM)	Temperature (Celsius)	Humidity (%)
10	IOT, Intelligent gateway webserver	111	29	32
11	IOT, WAN	550	26	55
12	WSN	119	28.81	19
13	WSN, Arduino	114	25.37	27

Table No.1: Comparison of control system, humidity, temp, Co2.

3. ADVANTAGES

1. The automated smart greenhouse always maintains ideal micro-climate conditions.

2. The greenhouse regulators are suitable to contemporaneously work the vacuity of sun.

3. Automated glasshouses give an affordable structure to cover status and descry suspicious conditioning.

4. By unleashing massive crop perceptivity, a smart greenhouse allows farmers to minimize labor work.

5. IoT detectors allow growers to collect colorful data points at unknown granularity.

6. The detectors in the field or in the hothouse can help the growers plan an optimum time to carry out the harvesting.

4. CONCLUSION

This review is proposed to support multifactor monitoring for the husbandry land. Intelligent hothouse eliminates trouble of hothouse not being maintained at specific environmental conditions due to mortal error and labor cost can be reduced and it's eco-friendly. Green house monitoring system has a huge demand and future compass too in India and outside the India.

5. REFERENCE

[1] Y. Ren, X. Chen, J. Jia, W. Gao, and J. Zhu, ''Environment monitoring and temperature prediction in greenhouse based on wechat platform,'' Nongye Jixie Xuebao., vol. 48, no. s1, pp. 302–307, Dec. 2017. doi: 10.6041/j.issn.1000-1298.2017.S0.046.

[2] X. Zheng, ''Expert control systems for modern greenhouse climate,'' Jidian Gongcheng., vol. 20, no. 3, pp. 42–45, 2003. doi: 10.3969/j.issn.1001- 4551.2003.03.014.

[3] F. G. Montoya, J. Gómez, A. Cama-Pinto, A. Zapata-Sierra, F. Martínez, J. de la cruz, and F. Manzano-Agugliaro, ''A monitoring system for intensive agriculture based on mesh networks and the Android system,'' Comput. Electron. Agricult., vol. 99, pp. 14–20, Nov. 2013. doi: 10.1016/j.compag.2013.08.028.

[4] R. Pahuja, H. K. Verma, and M. Uddin, ''A wireless sensor network for greenhouse climate control,'' IEEE Pervasive Comput., vol. 12, no. 2, pp. 49–58, Apr. 2013. doi: 10.1109/MPRV.2013.26.

[5] W. S. Lee, V. Alchanatis, C. Yang, M. Hirafuji, D. Moshou, and C. Li, ''Sensing technologies for precision specialty crop production,'' Comput. Electron. Agricult., vol. 74, no. 1, pp. 2–33, Oct. 2010. doi: 10.1016/j.compag.2010.08.005.

[6] N. K. D. N, ''ARM based remote monitoring and control system for environmental parameters in greenhouse,'' in Proc. IEEE ICECCT, Coimbatore, India, Mar. 2015, pp. 1–6. doi: 10.1109/icecct.2015.7226117.

[7] Y. He, M. Liang, L. Chen, D. Xu, and S. Du, ''Greenhouse environment control system based on IOT,'' Zhengzhou Daxue Xuebao Lixueban, vol. 50, no. 1, pp. 90–94, Mar. 2018. doi: 10.13705/j.issn.1671- 6841.2017263.

[8] S. Du, Y. He, M. Liang, L. Chen, J. Li, and D. Xu, ''Greenhouse environment network control system,'' Nongye Jixie Xuebao, vol. 48, no. s1, pp. 296–301, Dec. 2017. doi: 10.6041/j.issn.1000-1298.2017.S0.045.

[9] X. Chen, P. Guo, and Y. Lan, ''Design and experiment based on wireless sensor network with 780 MHz in greenhouse,'' Trans. Chin. Soc. Agricult. Eng., vol. 30, no. 1,

pp. 113–120, Jan. 2014. doi: 10.3969/j.issn.1002-6819.2014.01.015.

[10] P. Li, M. Chen, J. Wang, J. Zhou, and D. Xia, ‘‘Development of monitoring management system and data synchronization for greenhouse IOT,’’ Nongye Jixie Xuebao., vol. 46, no. 8, pp. 224–231, Aug. 2015. doi: 10.6041/j.issn.1000-1298.2015.08.031.

[11] P. Guo and J. Ma, ‘‘Design on intelligent environment monitoring system of agricultural greenhouse,’’ Zhongguo Nongjihua Xuebao, vol. 37, no. 4, pp. 71–73, Apr. 2016. Doi.

[12] G. Wang, ‘‘China’s first national standard for the Internet of Things system has been officially released,’’ Internet Things Technol., vol. 7, no. 3, pp. 3–4, Mar. 2017.

[13] J. Zheng, H. Ruan, W. Feng, and S. Xu, ‘‘Agricultural IOT architecture and application model research,’’ Zhongguo Nong Ye Ke Xue, vol. 50, no. 4, pp. 657–668, Feb. 2017. doi: 10.3864/j.issn.0578-1752.2017.04.006.

[14] S. Chen, ‘‘Design of ultrasonic sensor based on based on intelligent tracking and obstacle avoidance vehicle,’’ Ke Ji Feng, vol. 2018, no. 1, p. 10, Jan. 2018. doi: 10.19392/j.cnki.1671-7341.201801010.

[15] S. Dai, ‘‘Design and implementation of ultrasonic indoor positioning system,’’ M.S. thesis, Dept. Inf. Sci. Technol., Southwest Jiaotong Univ., Chengdu, China, 2017.