Intelligent Sericulture System Using Wireless Sensor Network and Image Processing

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ABSTRACT

Sericulture provides economic development for many people and improvement in the quality of life to the people in rural area and therefore it plays an important role in antipoverty programme and also India Stands fifth place in silk production .This implemented system involves the eradication of the difficulties faced by the farmers in manual intervention sericulture farm .Temperature, Humidity and Light intensity parameters plays vital role in the progression of silkworms because every stages need certain ranges. It's hard to maintain the parameters according to the environmental condition. So, we decided to do this system for make it as an easy process. This system involves the combination of Microcontroller, GSM module and Image processing for providing automated control features to the farm and the user. The automated system senses the inputs such as the temperature, light intensity, humidity through the sensors then send the information to controller. If the detected inputs exceed the threshold values then this information is conveyed to the user through the wireless network and necessary measures are taken by the microcontroller in order to avoid the fatalities that affect the farm as well as the growth of the silkworms by using auto controlled actuators like exhaust fan, heater and sprinkler. The communication between the system and the user is, achieved by the use of GSM module. Here, we use Image processing technique used to find out the colour change in the silkworms body. It indicates the non-identical stages such as black worms and swallow worms indicates the diseases worms. The objective of this model is to obtain silk, without compromising the quantity and quality of Silk.

Keywords—Image processing, white blood cells, IOT

I.   INTRODUCTION

Sericulture provides economic development for many people and improvement in the quality of life to the people in rural area and therefore it plays an important role in antipoverty programme and also India Stands fifth place in silk production The temperature and humidity plays a vital role in every stage of sericulture process, with this a lot of care is also needed to be taken to avoid diseases. Temperature, humidity and disinfection process should be managed to get a wonderful silk product. An ideal temperature of 23^0C to 28^0C and humidity in between 65% to 85% is to be maintained. The sensor network utilized in our smart sericulture system comprises of smart sensor nodes interfaced with temperature and humidity sensors to collect every stage life cycle readings inside the system. The automatic controlled actuators namely, air cooler, heater and sprayer maintain the temperature and humidity of the system. Image processing techniques is used to capture the pictures of sericulture process and to know about the status of sericulture process in the system.

This paper is organized as follow, section II discussessimilar related research.

II. LITERATURE SURVEY

A. AUTOMATED SMART SERICULTURE BASED ON IOTAND IMAGE PROCESSING

In this paper [1], we propose a design of smart monitoring and actuating sericulture system using ARM7 LPC2148 and Image processing technologies. The ARM7 LPC2148 will enable the end user to monitor and to actuate the sericulture system in real time by making use of an GSM. Prototype will operate in real time for monitoring and actuation inside the system. Image processing is used to know the real time status of complete silkworm growth and diseases.This system avoids over irrigation and top soil erosion and reduces the wastage of water. This system also monitors and controls the temperature of the silkworm rearing room continuously, within the fixed temperature range hence improving the yield.

B. INTELLIGENT CONTROL SYSTEM FOR SERICULTURE USING IOT

In this paper [2],.This "Intelligent control system for Sericulture" gives automation and guided control in sericulture advances by employing NodeMCU and IOT technology based invention. The proposed system facilities and conduct the environmental conditions to be reserved inside the silkworm rearing house.

Required edge values for parameters like temperature, relative humidity and light intensity can be stable based on the environmental circumstances. On the basis of requirement fan/cooler, light, and heater is turned on and off based on required environmental condition. The planned system is financially affordable and power effective organization. Implemented test of this prototype system validates that the proposed system can work gradually to observe the environmental conditions inside the silkworm raising house. The proposed system reduces the man power and reduces the chance of errors. The model is easy to implement and use.

C. IMPLEMENTATION OF SERICULTURE FARM AUTOMATION USING SENSOR NETWORK AND GSM TECHNOLOGY

This study [3] investigates .gives mechanization and supervisory control in sericulture cultivates by utilizing microcontroller and GSM based innovation. This model faculties and controls the climatic conditions to be kept up inside the raising condition. The actuators are turned on just when required and actuators utilized are effectively accessible and modest. The proposed framework is financially savvy and power effective arrangement. Preparatory trial of the model demonstrates that model can be worked progressively to monitor of natural conditions inside the ranch. It lessens the sericulturist's drawn out nearness in the raising unit.

D. ARDUINO BASED AUTOMATED SERICULTURESYSTEM

This system allows the [4] supervisory control in sericulture cultivates by utilizing microcontroller ARDUINO and GSM based innovation. This model faculties and controls the climatic conditions to be kept up inside the raising condition. The actuators are turned on just when required and actuators utilized are effectively accessible and modest. The proposed framework is financially savvy and power effective arrangement. Preparatory trial of the model demonstrates that model can be worked progressively to monitor of natural conditions inside the ranch.

E. ENHANCEMENT OF SILK PRODUCTION USING EMBEDDED SYSTEM

In this paper [5] we propose an Automated processing is a major advantage in this project, no need of presence of farmer in the farm all the time. Any changes in the climatic conditions like rise or fall in temperature and humidity unfavorable to silkworms will be sent to farmers by using GSM module. So that the farmer can monitor the condition of silkworms. The temperature and moisture level in the farm are controlled automatically. The sericulture farm is protected and entrance of insects is detected using IR sensor. It helps farmers come out of their economic crisis. This system is economically feasible

F. AUTOMATIC DETECTION ,CONTROLLING AND MONITORING OF TEMPERATURE IN SERICULTURE USING IOT

The objective of our study was to present the information about the use of automated monitoring and controlling technique in the aeroponic system. The aeroponic system is the new plant cultivation method of the modern agriculture. Its existence can allow producing food whole year without any interval. The system could create an excellent set which encourages the sustainable city life for those peoples who want to live in urban area. Moreover, during plant growth from sowing to harvest time, the methods adopted in the aeroponic system require a little hand-operated contribution, interference regarding physical presence, and expertise in domain knowledge of plants, environment control, and operations to maintain and control the growth of the plant.Therefore, the system is considered hitherto to be somewhat unsuitable for the grower, and due to the above reasons, it is not common to find an installation. We reviewed the literature and found that implementation of advanced monitoring technology tools in aeroponics could provide an opportunity for the farmer to monitor and control several parameters without using laboratory instruments, and the farmer can control the entire system remotely. Thus, it could reduce the concept of the usefulness of the system due to the complicated manual monitoring and controlling process

III. PROPOSED SYSTEM

Generally, the The Microcontroller (NODEMCU) is the heart of the framework which is customized such that it will screen and control the parameters within the threshold values. There are two sensor temperature, humidity and light sensor. The DHT11 sensor measures the temperature and relative humidity which splits over a digital signal with temperature and humidity, given to NodeMCU. LDR (light dependent resistor) measure the light intensity in the rearing house. Cooler and temperature control unit (heater) maintain the temperature within the threshold values. OLED display the environmental parameters. Relay is an electrically operated switch to protect the electrical circuit from the faults.

The information and condition in raising house will be sent to agriculturists mobile through the GSM. Image processing technique mainly used to monitor and find out the diseases and different stages of the silkworms body, if the silkworm is swallow then it reaches the unhealthy form .
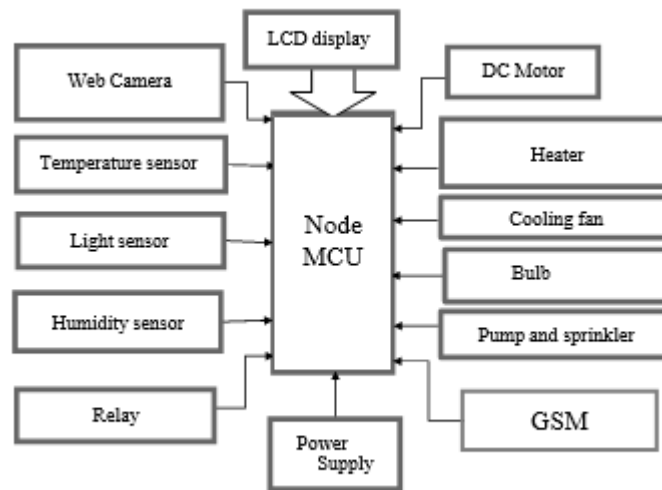

Figure 1. Implementation of sericulture system using image processing

IV. EXPERIMENTAL RESULT

The part of temperature, relative humidity, air dissemination and light that would influence the embryonic advancement of silkworm can be comprehended as takes after: In our project we are using NodeMCU and Image processing technique to design a automated smart sericulture system and its in operate in real time. nodeMCU is controlling all the sensors i.e. temperature sensor, moisture sensor, LDR and actuators i.e. fan, motor, bulb. Our project start with the GSM initialization. After successful initialization of GSM, we have to register a mobile number to receive the information about every environmental changes in the silkworm rearing room. we are using temperature sensor to maintain the required temperature in the rearing room, the required temperature for healthy growth of silkworms to obtain maximum production of silk is 25℃ to 28℃ If the temperature is above this level thefan will turn ON automatically.

V. CONCLUSION

In this paper, present a design of smart monitoring and actuating sericulture system using NodeMCU and Image processing technologies. The NodeMCU will enable the end user to monitor and to actuate the sericulture system in real time by making use of an GSM. Prototype will operate in real time for monitoring and actuation inside the system. Image processing is used to know the real time status of complete silkworm growth and diseases. This system also monitors and controls the temperature of the silkworm rearing room continuously, within the fixed temperature range hence improving the yield

REFERENCES

[1] Yashaswini. B, Madhusudhan, Nagmani, Dr. Suresh. Department of Electronics and Communication Engineering RNS Institute of Technology, Bangalore, India"Automated Smart Sericulture Based on IoT and Image Processing Technique"2020

[2] Bhargava Ram P,Guru Sreedhar,Thulasi Priya N,Lakhan B Makam,Mr Mylara Reddy, Department of Computer Science and Engineering,GITAM School of Technology, Bengaluru campus, Karnataka, India"Intelligent Control System for Sericulture using IOT ",Journal of Xi'an University of Architecture & Technology, 2020

[3] Gunasheela T , Renuka V Tali, Prathiba S ,Shilpa A P Assistant Professors, Dept. of ECE, K.S. School of Engineering and Management Bengaluru,India,"Implementation of Sericulture Farm Automation using Sensor Network and GSMTechnology ,International Journal of Pure and Applied Mathematics,2019

[4] Manjunatha, Mr. Mahesh B.Neelagar Department of Studies in VLSI Design & Embedded System Engineering, VTU Belagavi, India,"Arduino based automated sericulture system",International Journal of Computer Science and Mobile Computing,2019

[5] Prof. Manjula G, Mr.Manjunath R. Mr. Dilip v. Mr. Arun raj,department of information science and technology,East west institute of technology, Bengaluru,"Enhancement of silk production using Embedded system",40S_BE_0150

[6] Kosalendra Eethamakula, E. Vinodh Kumar, K. Yateesh Babu, M. Naveen Kumar Department of ECE, Siddharth Institute of Engineering & Technology, Puttur, AP."Automatic Detection, Controlling and Monitoring of Temperature in Sericulture Using IOT"The International journal of analytical and experimental modal analysis,2020