IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 2, April 2022
Impact Factor: 6.252

Computer Lab Automation using IoT

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Abstract: *The Internet of Things (IoT) is the fastest growing computing technology integration that conceives the primary objective of associating real world objects with the internet. In the process of creating a smart lab, this method can be absorbed to make a lab automated. This paper bases on building an automated PC lab. Understanding the pros and cons of the IoT technology such that the harmful effects like are minimized and benefits are increased makes up a relevant point in building the model. This paper has been written with keeping the rate of growth of automation products/industries and with this the project is made.*

Keywords: Internet of Things, Automation, Computing, Technology.

I. INTRODUCTION

Since the introduction of automation to this world, there has been an immense help that's been provided to the mankind. In addition to that, looking in the past years, there has been a massive growth in automation industries and its been expected to see the same growth in upcoming years. Automation is used in different places such as factories, companies, homes etc. But the cause remains the same that is to produce goods and benefits for the humans with the minimal efforts of labour. In most of the places like in schools, colleges the use of automation has not been introduced yet due to which the young students are not aware of the real-life applications of automation.

Our Lab Automation introduces the real-life application of automation hardware and software in the lab of colleges and schools which will make the lab more advanced in technology and will help the teachers to guide and interact with the students more efficiently. Computer lab automation can also be used for other purposes (such as distributed testing, problem solving, individualized instruction etc.). Although computer lab automation is most productive when used primarily to support sophisticated control and learning in a instructional context, it may also be used to support research and training. This automation system that uses Arduino microcontroller as centralized system to control the devices and is design in such a way that it can turn the devices on/off according to the user wishes. The Hardware interface module consists of Arduino UNO MC, Relay module and sensors. The Arduino microcontroller is the main controller that performs the necessary actions that needs to be carried out. It is one of the several solution approaches available in computer labs today.

II. GOALS AND OBJECTIVES

The main objectives of the computer lab are -

- To enhance the technological capabilities of the computer lab.
- To make a work efficient model for Automation of Computer Lab.
- To increase the overall throughput and accuracy of the operations performed in the lab.
- To influence the students as well as teachers overall experience to be positively impacted.
- To make an automated lab which comprises of features such as temperature and humidity regulator along with LED light controller.
- To increase the interactivity of the among students in computer laboratory.
- To increase the productivity of the laboratory and make resources more reliable to the students as well as staff.

III. SYSTEM ARCHITECTURE

Nowadays, there is a need for the introduction of automation in the classroom lab of various colleges. This automation lab project will help in assisting many educational institutes in initiating the system of automation in their labs and by adding more features as the technology grows in the future.

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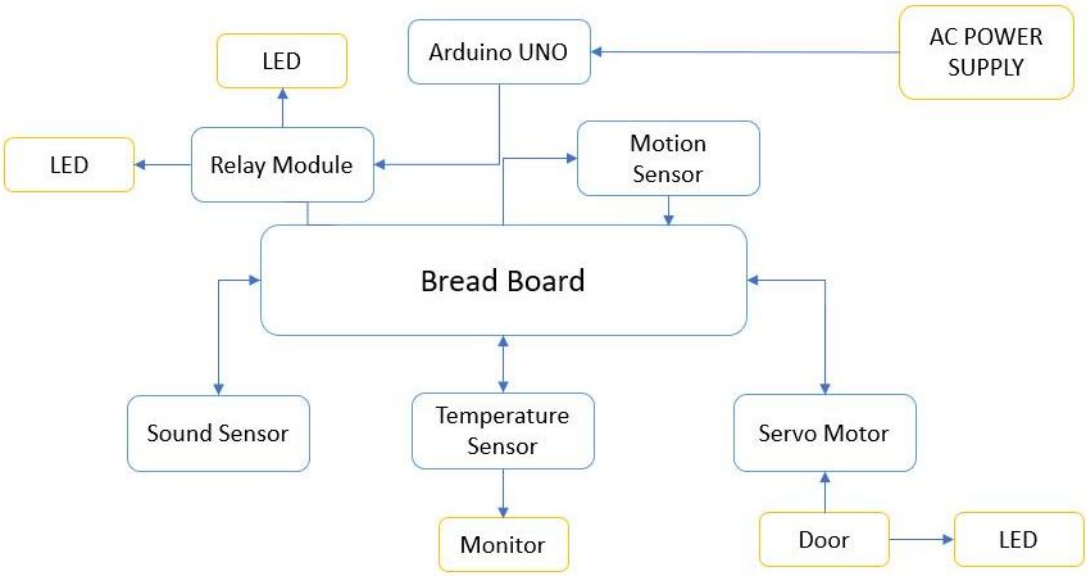

3.1 Current Scenario

The modern features and introduction of automation have helped and transformed many sectors despite not making much progress in classrooms. Due to this, the students are not aware of all these technologies which are upgrading and spreading all around the world. The need for this system in colleges is completely compulsory so that the students are not unfamiliar with the booming industry of automation.

3.2 System Backend

This project has been made with the hardware and software as a hybrid mixture of both in a very efficient way and we have tried to make this project by including items of low cost with the incentive of so that the colleges can implement this project with low cost. The components that we have included are-

Arduino Microcontroller	Servo Motor
Breadboard	Relay Module
Jumper Cables	Bulb Holder
DHT11(Temp + Humidity Sensor)	LED bulb
Motion Sensor	

3.3 Proposed System

The proposed system is user-friendly and very convenient to use. Basically, when a user tries to enter the lab room, the sensor at the top of the door will automatically open the door when the user is within the range of the sensor. With the help of the sensor, the user should have no problem turning on all the electrical appliances such as lights, fans, humidity and temperature, and computers as well simultaneously, as all of these are connected to a single sensor. The incentive is to turn a simple computer laboratory into an automated laboratory.

Salient features –

- Provide convenient and fast access to laboratory
- Enhance the characteristics, speed, and productiveness of facilities.
- Optimize the time of students and lab assistants.

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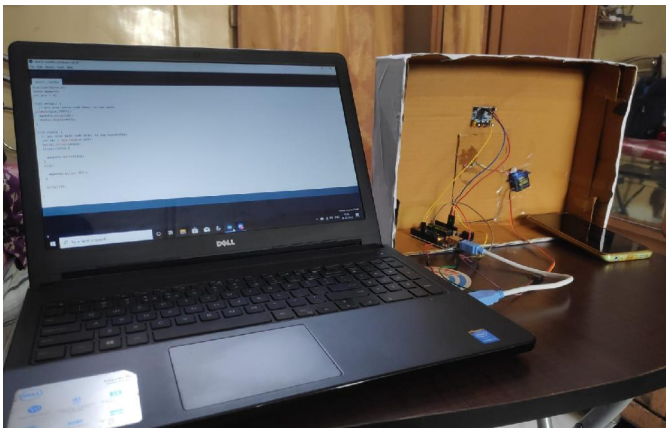

Figure 1: Motion sensor aided Laboratory door

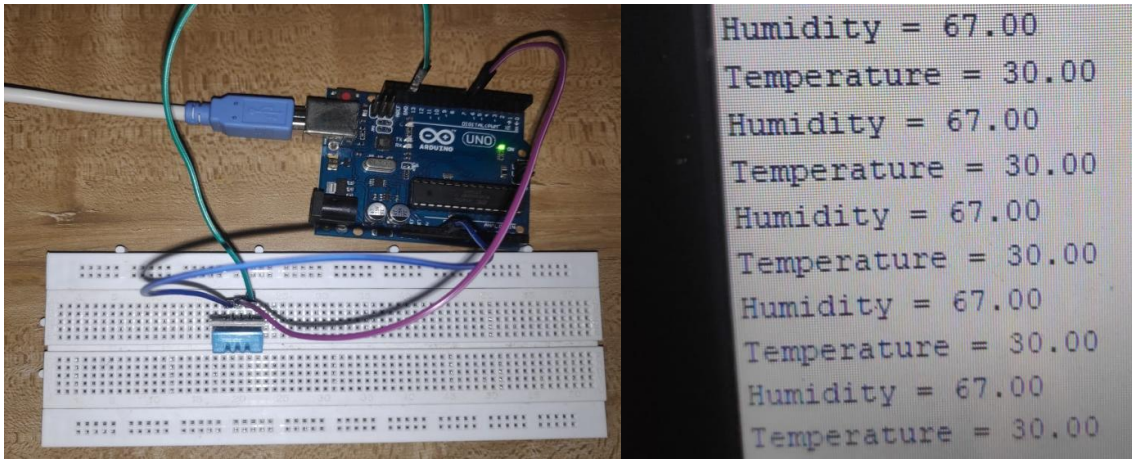

Figure 2: Humidity and Temperature Sensor

IV. Conclusion

Our Automation laboratory project makes the use of a hybrid model of hardware and software that turns a simple college laboratory into an automated laboratory. This helps the students and lab assistants to easily access the laboratory resources in a more efficient, convenient, and less tedious way. This will also bring out another characteristic of automation which is including less man work.

Acknowledgement

- Prof Vinod Alone, Department of Computer Engineering, VPPCOE.
- Dr. Mahavir Devmane, HOD, Department of Computer Engineering, VPPCOE.
- Dr. Alam Shaikh, Principal, Department of Computer Engineering, VPPCOE.

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