

**POWER CONSRVATION OF INDUSTRIAL AND DOMESTIC APPLICATION
USING LAB AUTOMATION SYSTEM**¹Aniket Khaire , ²Anurag Mali, ³Pravin Mhatre, ⁴Roshan Nivate, ⁵Asst. Prof Swapna ManurkarDepartment of Electrical Engineering, Mumbai University / ViMEET, Khalapur, India1
aniket.khaire442000@gmail.com**ABSTRACT**

The visitor counter is a reliable circuit that takes over the task of counting number of persons /visitors in the room very accurately and beeps a warning alarm when the number of visitors exceeds the capacity limit of the auditorium/hall. When somebody enters the room then the counter is incremented by one (+1) and when any one leaves the room then the counter is decremented by one (-1). The total number of persons inside the room is also displayed on the LCD (Liquid Crystal Display).

The microcontroller is used for detecting an entry or exit action and computing the figures (addition and subtraction) to acquire accurate results. It receives the signals from the sensors, and this signal is operated under the control of embedded programming code which is stored in ROM of the microcontroller. The microcontroller continuously monitors the Infrared Receivers. When any object pass through the IR Receiver's then the IR Rays falling on the receivers are obstructed. The obstruction occurs under two circumstances, either you obstruct sensor 1 (i.e. outside the building) before sensor 2 (i.e. which is inside the building) this shows that you are entering the building or you do it the other way round, which is obstructing sensor 2 before sensor 1 to indicates an exit movement. This obstruction is sensed by the Microcontroller, computed and displayed by a 16x2 LCD screen.

Keywords: *microcontroller, LCD, infrared sensor*

INTRODUCTION

Smart lab is the control of lab devices from a common control point, where many things are completed every day usually automatically, the basic and a common task is turning on or off certain devices, that can be done either remotely or in close proximity. The popularity of wireless networks in the lab has increased in recent years, and the advanced computer technology has made the personal digital device to commonly communicate through the wireless network. One of the possible applications are wireless networks for smart labs. It can be as basic as reducing the brightness of lights with a remote control or it can be as complex as setting up a network of various items in the house that can be programmed using a main controller. The elementary idea of smart labs is to employ sensors and control systems to monitor a lab, and according to that adjust lighting and other services of the lab. The automated Intelligent lab can provide a safer, more comfortable, and more economical lab.

In the smart lab application, to control the lighting system is important, due to the efficiency of electricity consumption. To turn on and turn off the lights in the lab always use the conventional switch. It is not effective, especially if the building has many levels that are light on each floor. Lighting contributed as much as 20-60% of the total consumption of electric power consumption, therefore it would be a waste of energy if the lights are forgot to turn off. Therefore, the lighting control system is needed to overcome such condition. The tasks become easier and produce an effective way. Lighting control in a smart lab system is a computer-aided system that takes place automatically and programmed by computer, in a building or residence. The control commands

can be done by simply pressing a button on the gadget, or through automated systems that can detect the environment by itself. Remote monitoring technology used allows the user to monitor the state of the house in real-time]. However, the algorithm must be in simple process with good results, due to it works in the realtime condition. In addition, the algorithm must be robust with the uncertainty, and imprecision because several sensors are used as an input parameters

LITERATURE SURVEY

1901 – 1920–The invention of lab appliances: Although lab appliances aren't what we'd consider smart, they were an incredible achievement in the early twentieth century. These Achievements began with the first enginepowered vacuum cleaner in 1901. A more practical Electricity-powered vacuum was invented in 1907. throughout two decades refrigerators would be Invented, as well as clothes dryers, washing machines, irons, toasters, and so much more.

1966 – 1967–ECHO IV and the Kitchen Computer: Although it was never commercially sold, The ECHO IV was the first smart device. This clever device could compute shopping lists, control the Lab's temperature and turn appliances on and off. The Kitchen Computer, developed a year later, Could store recipes, but had the unfortunate tagline, "If she can only cook as well as Honeywell can Computer" and therefore sold no models. 1991–Terotechnology: Terotechnology combines gerontology and technology and makes the lives of senior citizens easier. In the 1990s, there was a lot of new research and technology in this Sector.

1998 – Early 2000s – Smart Lab: Smart labs, or lab automation, began to increase in popularity in the early 2000s. As such, different technology began to emerge. Smart labs suddenly popularity in the early 2000s. As such, different technology began to emerge. Smart labs suddenly became a more affordable option, and therefore a viable technology for consumers. Domestic technologies, lab networking, and other gadgets began to appear on store shelves. Today's Smart Labs – Today's smart labs are more about security and living greener. Our smart labs are sustainable, and they help to ensure that our labs aren't expending unnecessary energy. They also help alert us to intruders (whether we're lab or not). Current trends in lab automation include remote mobile control, automated lights, automated thermostat adjustment, scheduling appliances, mobile/email/text notifications, and remote video surveillance. Lab Automation through Motion Sensors also falls into the class of the Today's smart lab category (The History of Smart Labs, 2014) became a more affordable option, and therefore a viable technology for consumers. Domestic technologies, lab networking, and other gadgets began to appear on store shelves. Today's Smart Labs – Today's smart labs are more about security and living greener. Our smart labs are sustainable, and they help to ensure that our labs aren't expending unnecessary energy. They also help alert us to intruders (whether we're lab or not). Current trends in lab automation include remote mobile control, automated lights, automated thermostat adjustment, scheduling appliances, mobile/email/text notifications, and remote video surveillance. Lab Automation through Motion Sensors also falls into the class of the Today's smart lab category (The History of Smart Labs, 2014).

METHODOLOGY

Internet Research: While putting together this report, I used to Internet to gather information and Knowledge from different authors and from sites like Wikipedia, Instructable, Electronics Hub, Wiki-How, IoT revolution, About.com along many others which has written topics related to the Seminar topic. I majorly had to read the history of Lab Automation from Wikipedia, this gave me a clearer scope for the topic. Literature Study: In putting together this work of research, I downloaded several pdf files of previous Related project reports and also some company manuals of some Lab Automation devices so as to Understand the functionality of the PIR Sensor (a type of Motion Detectors).

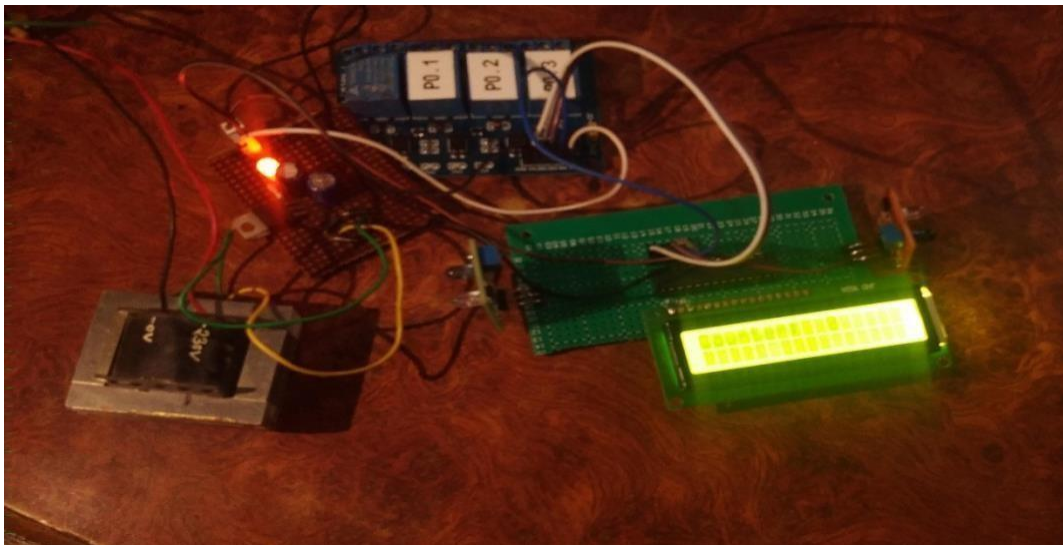
YouTube Videos: In the process of putting together this report, so as to understand the functionality of Lab Automation through Motion Sensors, I had watch videos on YouTube about it modes of Operation.

Stimulating Program: After getting my major points of research, limitations and scope of the topic. I Had to stimulate using Proteus Circuit Design Software my preferred solution to one of the limitations Of the research topic.

COMPONENT LIST

SR NO.	COMPONENTS	NO. OF PIECES
1	ARDUINO UNO	1
2	RESISTORS	1
3	LED DISPLAY	1
4	IR SENSORS	2
5	TRANSFORMER	1
6	CONNECTING WIRES	AS REQUIRED

RESULT



FUTURE SCOPE

- 1) This project is more energy efficient and improve lab safety.
- 2) With the help of this project we can adjust the light intensity level and it's "ON" time also.
- 3) Easy for maintenance and troubleshooting . This system has longer life spam.
- 4) This system is come in price which is easier on the wallet and will be easy to installation

CONCLUSION

The system as the name indicates, 'Lab Automation' makes the system more flexible and Provides attractive user interface compared to other home automation systems. In this system We integrate mobile devices into lab automation systems. A novel architecture for a lab Automation system is proposed using the relatively new communication technologies. The system consists of mainly two components is a Arduino, relay circuits. We hide the complexity of the notions involved in the lab automation system including them into a simple, but comprehensive set of related concepts. This simplification is needed to fit as much of the functionality on the limited space offered by a LCD device display. This paper proposes a low cost, secure , ubiquitously accessible, auto-configurable, remotely controlled solution. Hence we conclude that the required goals and objectives of lab

automation system have been achieved. Finally, the proposed system is better from the scalability and flexibility point of view than the commercially available lab automation systems.

REFERENCES

- [1] Prof.H.B.Shinde,Abhay Chaudhari,Prafull Chaure, Mayur Chandgude, “Smart lab automation system using android application,” in IRJET, vol. 04, April 2017.
- [2] Krishna Rathi, Dinesh Patil, Sayli Bhavsar, Ketaki Jadhva, Prof.Saurab V.Thakur,”Gesture human-machine interface (GHMI) in lab automation,” in IRJET,vol. 04, issue:06,june 2017.
- [3] A.Vasanth Padhmaavathi, G.Nandhini, S.Keerthika, “Handsfree lab automation for disabled person,” in JGRCST, vol. III,Issue-XII, November 2015.
- [4] Gagan, “Iot based system for person with physical disability,” in IJIREEICE, anshvol. 4,Special issue 2, April 2016.
- [5] E.Gopinath,“Controlling a human computer interaction 9hci) using electro-oculography (eog)signal,” in IJAREEIE, vol.2,Issue 1, pp. 1-5,08- 03-2014.
- [6] Jay Kumar,Anshul Sengar, Mohit Kumar Sharma, Manoj Kumar Patel, Simant Rahul Singh “Controlling a human computer interaction 9hci) using electro-oculography (eog)signal,” in IJAREEIE, vol.2,Issue 1, pp. 1- 5,08-03-2014.
- [7] Neha Malik, Yogita Bodwade,”Literature review on lab automation system,”in IJARCCE, vol.6,Issue 3,March 2017.
- [8] Nainsi Soni, Manish Dubey,”A review on lab automation system with speech recongition and machine learning,”in IJARCSMS, vol.5,Issue 4, April 2017

