SMART CLASSROOM AUTOMATION

Project report submitted of the requirement for

the degree of Bachelor of Technology

in

Computer Science and Engineering/Information Technology

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to

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Certificate

Candidate's Declaration

I herewith declare that the work given during this report entitled "Smart Classroom Automation" in partial fulfilment of the necessity for the award of the degree of Bachelor of Technology in Computer Science and Engineering/ Information Technology submitted within the department of Computer Science & Engineering and Information Technology, Jaypee University of Information Technology Waknaghat is associate authentic record of ourvery own work meted out over a amount from August 2017 to May 2018 beneath the supervision of

Dr. Geetanjali Rathee (Assistant Professor (Senior Grade)).The matter embodied within the report has not been submitted for the award of the other degree or diploma.

Harshit Singh (141422) ....
Akash Parmar (141407) ....
Shashank Jaishwal (141403) ....

This is to certify that the above statement made by the candidates is true to the best of my knowledge.

Dr. Geetanjali Rathee
Assistant Professor
Computer Science & Engineering
Dated:

ACKNOWLEDGEMENT

We would prefer to categorical our special thanks of feeling to our project guide Dr. Geetanjali Rathee who helped us in conceptualizing the project and actual building of procedures wont to complete the project. We would additionally prefer to convey our thank our Head of department for providing us this golden chance to figure on a project like this, that helped us in doing a heaps of analysis and we came to understand regarding such a large amount of things.

Secondly we would prefer to convey our family and friends who guided us throughout the project therefore on complete our project on time.

Thanking you,

Harshit Singh (141422)

Akash Parmar (141407)

Shashank Jaiswal (141403)

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ABSTRACT

Smart classroom is the representative of the modern teaching. With the advent of modern technology it becomes easier for the students as well as teachers to perform their task more efficiently. With the aid of modern technology it has become easier for the students and teachers across the world to get a good grasp of the theoretical as well as practical knowledge.

Through technology it has become easier to visualize anything in 3D and therefore the technology helps us to be conversant of the nuances of any concept.

The smart classroom is rectification to various problems that teacher as well as student faces inside the classroom. This projects aims to make use of the modern technology for helping the teachers in utilizing more time for teaching and students to easily get access to the study material. In this project we are building a prototype of smart classroom in which an application would be pivotal for carrying out various operations in classroom.

Chapter 1: INTRODUCTION

The quality of education is a vital demand in today's competitive setting. Technology has affected us in each facet. Intuitive categories are a progressive approach of education within the education situation in India that offer quality teaching and learning opportunities to lecturers and students by serving them to longer devotion towards the teaching, better construct formation and educational action.

In efforts to grow academically it should be considered that differentiated modalities of teaching and learning area unit necessary to implement deeper levels of growth and abstract development ICT has gone from being a communication and information technology to a system of creation and distribution of curricula for lecturers and students.

New teaching ways are introduced that are called intelligent category. It uses instructional material, 3D animated modules and videos, and every one fame instructional institutions use this idea. The idea of intelligent schoolroom has not solely created an interesting education however a chance for college kids to boost their performance.

The possibilities or blessing of good lecture rooms area unit endless. Though adopting such a brand new idea could be tricky call for several however the technology will produce new gap for the education sector.

1.1 Smart Classroom

A smart learning setting not solely permits students to access digital resources and Engage in learning systems anyplace and anytime however additionally actively provides necessary student learning, suggestions and support tools, study suggestions within the right place, at the correct time and to the correct manner.

Smart Classroom: The smart classroom is an enhanced classroom of technology that improves teaching and learning opportunities by group action learning technologies, like computers, special software, response technology audiences, helpfull listening devices, networking, and audio / visual capabilities.

• **Connected devices**: These are electrical devices that are smart, courtesy of Internet connectivity as well as sensors. The Master can control these devices from their phones from anywhere in the room.

• **Internet of Things**: It's a enchantment wand that turns the classroom into a keen classroom. In conjunction with the combination of sensors, savvy frameworks, Android apps, IOT interface every day accessible objects to a organize, which empowers these things to total errands and communicate with each other , without input commitments from the client.

After you incorporate automation within the classroom, associated gadgets and IOT you'll be able get Smart Classroom. A present day shrewd domestic can be effectively overseen through a Smartphone, tablet.

Why do we need Smart Classroom?

• **Digital Helps Help Students Understand Higher Subjects**

There are no days of conventional black-board instruction. Nowadays is the age of savvy classes that permit instructors to supply instruction with PowerPoint introductions, word words, sound sessions, and video screenshots as well as photos.

A picture is worth a thousand words! Beside the well known platitudes, it is through smart classes that students can recognize all the data displayed through these instructional instruments. Since the educator isn't composing to board, understudies can way better concentrate on the course, distinguish audio-visual (AV) data through advanced instruments such as CDs, write drives and PDF records sent to students.

This way of instructing and learning hence maintains a strategic distance from the issue of making notes whereas the interview is being conducted. Since the notes will be given to them through these modes, they can centre more proficiently amid the class.

• A Top Bet for Absentees

Now not worry in the event that you would like to neglect your keen course for a day. Understudies of shrewd classes can get to addresses at any time since everything is recorded on computerized devices. You'll be able essentially download the recorded addresses that are transferred to the internet by writing in your client ID and watch word and getting to the think about fabric conferred in your nonappearance. In this way, your computerized notes will come to your protect when you miss one day at school without putting any additional exertion to induce the same.

• Ease of Retention

Keen classes utilize electronic devices that are simple to utilize and keep up. Employing a computerized write with other electronic contraptions contains a very low maintenance taken a toll. This is often a one-time speculation that you just got to make in differentiate to the utilize of markers and chalks made by their solid nearness felt in conventional classrooms. A one-time benefit at all contraptions is all that's required for your keen course to supply quality instruction to information seekers or Getting the Finest Out of Technology All much appreciated to the present day age we are all part of, shrewd classes have one "Technology-aided classroom consider" tag line. It is by using innovation that you simply can know approximately curiously and novel things. You'll be able utilize a number of advanced instruments in your interest of quality education.

- **"Go Green" with Smart Classes**

Smart classrooms are a culminate arrangement to the natural risks that are postured by routine technique of instruction. There will be making a "Go Green" zone once you will learn approximately your preferred subjects without any utilization of the paper and write. You do not ought to depend on any printouts and the scanners which lead to any kind of arrangement of a carbon impression. This way, a savvy lesson can without a doubt gotten to be an brilliantly and practicable way to clear way for the greener environment.

- **Ideal alternative for Students with Different IQs**

It takes all kind of understudies to form up a course. Whereas a few understudies get a handle on the concepts in a short time, there are others who will have to be go through rehashed clarifications. In such a circumstance, savvy classes come as befitting learning alternatives. Since you learn through diverse shapes of media, these progressed advances show an curiously stage for both the instructors and the students

A parcel can happen through the visual impacts of a savvy lesson. These impacts bring a energetic point of view to instruction. Thus, shrewd classes come in as culminate learning domains for understudies to acclimatize subtleties behind any of the subject in a single go or after more than once getting to subject points of interest for a clearer understanding.

1.1 Internet of things

Internet of Things (IOT) is the organize of "things" or objects coordinates in electronics, software, sensors and organize network, which permits these things to gather and replace a huge sum of information. The Web of things permitting things to feel as well as being controlled absent from existing arrange frameworks, creating openings for direct integration between the physical world and computer-based frameworks, driving to greater productivity, precision and benefits financial Each component is explicitly distinguished through the coordinates computer framework, but can work inside the existing Internet infrastructure.

Several tools and applications of IOT are:

- ☐ Environmental monitoring or infrastructure management or labor process

- ☐ Managing energy resource doctors, as well as health care systems or automation of homes and buildings

- ☐ For transportation purposes

Figure 1: IOT Applications

1.1.1 Benefits of IOT

Ubiquitous systems: Individual Wi-Fi on any of your keen phones plus on numerous of other devices. Everybody (and everything) needs in addition to should be associated

- o **Connected computing** :We require all kind of contraptions, sagacious telephones, TVs (hued or dim and white), dvd players, vehicles and so forth with a specific end goal to keep record of what we are doing, seeing, scrutinizing, and additionally tuning in to as we impact from start to finish of the day, starting with one put then onto the next – the handoffs from device to device is going on starting at now.

- o **Intelligence at the periphery of the network**: Jim Gray, who is creative thinker database connoisseur from Microsoft, conceived savvy sensors carrying on like a small-database with set in machine learning calculations as well as the pseudo codes. Here is verbatim through which he specified it (10 a long time back): "Intelligence is influencing to the margin of the systems. Each of the disk frameworks and each sensor module will be a spirited database machine."

- o **Analytics-as-a-Service:** The Programming interface and Application economies are starting at now onwards is giant and developing which facilitates any "thing" to "accomplish something fascinating" as long in light of the fact that it can be related to a Programming interface or it can summon an Application that does a system based administration. The "thing" could be a data generator in addition to gatherer that gains from, makes conjectures, and maybe in reality takes information driven exercises in response to data that are gathered (through adaptability and solace of an Application or Programming interface call) as well.

- o **Marketing automation:** Engagement of client through Shrewd phone, the geological-location or iBeacon etc. are all creating a arrange of the information and data with respect to customers' areas, eagerly, inclinations, and buying designs. Clearly, the degree of geographical location-based information must keep up the

proper adjust between client protection plus the opportune conveyance of vital and critical items and administrations of specific user.

o **Supply Chain Analytics**: Conveying within time items at the time of requirement (inclusive of the utilize of RFID-based following). Altogether, the whole thing may be client (comprehensive of machines, automobiles, fabricating plants, ATM machines, etc.), plus the internet of things is checking, observing, and holding up for the item should emerge.

1.3 Objective

- To build a prototype for smart classroom controlled by using Raspberry Pi, along with relays.
- The objective is to free teacher from secondary jobs.
- Application that would be pivotal for the entire functioning of classroom
- Attendance process through facial recognition
- Easy access to the study material
- Controlling the electrical devices

Chapter 2

LITERATURE REVIEW

2.1 HOME AUTOMATION USING RASPBERRY-PI THROUGH WIRELESS SENSORS WITH HELP SMART PHONE: P BHASKAR RAO, S.K. UMA

The proposed paper display ease over deliver the monitoring system and home automation by making utilization of an implanted microcontroller and microprocessor, together with the IP connectivity for receiving way to controlling devices plus appliances distantly wielding Smart phone application. The system planned doesn't necessitates a PC server with regard to alike systems together with offering entirely anew communication that screens and controls the house condition with far greater features than just the switching on/off functionality. To institute the efficacy of this system, devices, for instance, light switches, power plug, temperature sensor, etc that can be incorporated with the system.

2.2 Face Recognition using Local Binary Patterns (LBP)

Face recognition is an demanding problem, and have an impact on important applications in numerous domains for instance recognizable proof for the law enforcement, authentication for the keeping money and security framework access, and individual recognizable proof among others. Face representation limns how to model a face and discerns following algorithms for recognition and detection. The main constructive and the exclusive highlights of face picture are evoked in the following element extraction stage. In the following research work, we experimentally appraise face recognition that believes mutually the shape and texture information in order to embody face images that are based on Local Binary Patterns (LBP) for the person autonomous face recognition.

Face Recognition using Local Binary Patterns

The centre thought is that for every last pixel of an image the Local Binary Patterns -code is deliberated. The occurrence of every probable pattern in image is reserved up. The histogram of the specified patterns, also known as labels, leads to formation of a feature vector, what's more, is hence a depiction for the texture of sample image. These histograms would then be able to be used to quantify the analogy between images, by quantifying the distance between histograms.

The Implementation

Face acknowledgment isn't at all an inconvenience free issue since a new face picture seen in extraction stage is commonly disparate from the face picture found in classification stage. Though nearby paired highlights has been inspired from the face representation for the face acknowledgment that there are various face picture utilizes as a part of the database that compared with the info confront picture. The face picture rotate on the survey lighting and ecological conditions. Likewise, confront picture changes according to the articulations. In the examination work, that has been adaptable and equipped, ought to be take care of the issues.

The Algorithm for Face Recognition

Input: Training Image set

1. Initialize temp = 0

2. FOR each image I in the training image set

3. Initialize the pattern histogram, H = 0

4. FOR each centre pixel tc ∂I

5. Compute the pattern label of tc, LBP(1)

6. Increase the corresponding bin by 1

7. END FOR

8. Find the feature with highest LBP for each face image and combine it into single vector

9. Compare with test image face

2.3 Home Automation through implementation of IOT : Vinay Sagar, KN. Kusuma, SM. (2013)

In the new fangled world, the Home automation systems has to deal with four main challenges; these encompasses: high cost of the ownership, inflexibility, poor manageability, plus trouble in achieving the security. The prime objective of the very project is to plan and execute a home automation system with the help of Internet of things (IOT) that is competent of controlling and automating much of the application in the house through a simple and handy web interface. The framework proffered in paper, has an enormous adaptability of with Wi-Fi innovation to interconnect the conveyed sensors to the home robotization framework server. This will in the end diminish the arrangement cost together with expanding office of overhauling and the framework reconfiguration.

2.4 A Face Recognition Technique using Local Binary Pattern Method

LBP is actually a very potent technique to explicate the texture and model of a digital image. As a result, it was perfect for feature extraction in face recognition systems. A face image is first divide into numerous small regions that LBP histograms are elicited and then concatenated in to a single feature vector. Then this vector forms an well-organized depiction of the face area and can be used to calculate similarity between images. Automatic facial expression study is a attractive and difficult problem, and impacts key applications in numerous domains such as human–computer interaction and data-driven animation. Deriving a facial demonstration from original face images is an crucial step for successful and efficient facial recognition expression system In the paper, we appraise facial representation predicated on statistical local features, Local Binary Patterns (LBP), for facial recognition expression. Diverse machine learning methods are methodically appraised on numerous databases. Broad experiments demonstrate that the LBP features are successful and competent for facial recognition expression.

Algorithm

We initiate by briefing the key universal methods of the algorithms used in this work. Then we illustrate every step in detail. The proffered face recognition process includes four main parts:

1) **Preprocessing:** We start by using the Trigg's and Tan' illumination algorithm for normalization to balance for lighting deviation in the face image.
   No further pre-processing, such as for instance face arrangement, is performed during the pre-processing.

2) **LBP operator application:** In the 2nd step LBP are gauged for each pixel, building a superior scale textural account of the image.

3) **Local feature extraction process**: Local features are formed by computing histograms of LBP on the local regions image.

4) **Classification**: Each sample face image within test set is classified by Juxta posing it beside the face images in the training set.

Methodology

Smart Classroom, can be defined as the classroom equipped with the technology to aid teaching and learning .We often see that from entering the class to leaving it much of the time teacher is occupied in many of secondary nature jobs such as taking the attendance which (cases where class size is more than 60) eats up much of the time and after that adjusting the lighting of the room etc. Thus teacher is left with a portion of allotted time which in much of the cases is not suffice. To eliminate this conundrum smart classroom would be the best rectification.

With the help of smart classroom it would be easier for teacher to focus on primary job (teaching) whereas the secondary job can be done in miniscule part of allocated time.

It makes it possible to control lighting, projector as well as allows the teacher to mark attendance through the facial recognition system. Even it allows the students to access the study material through the email.
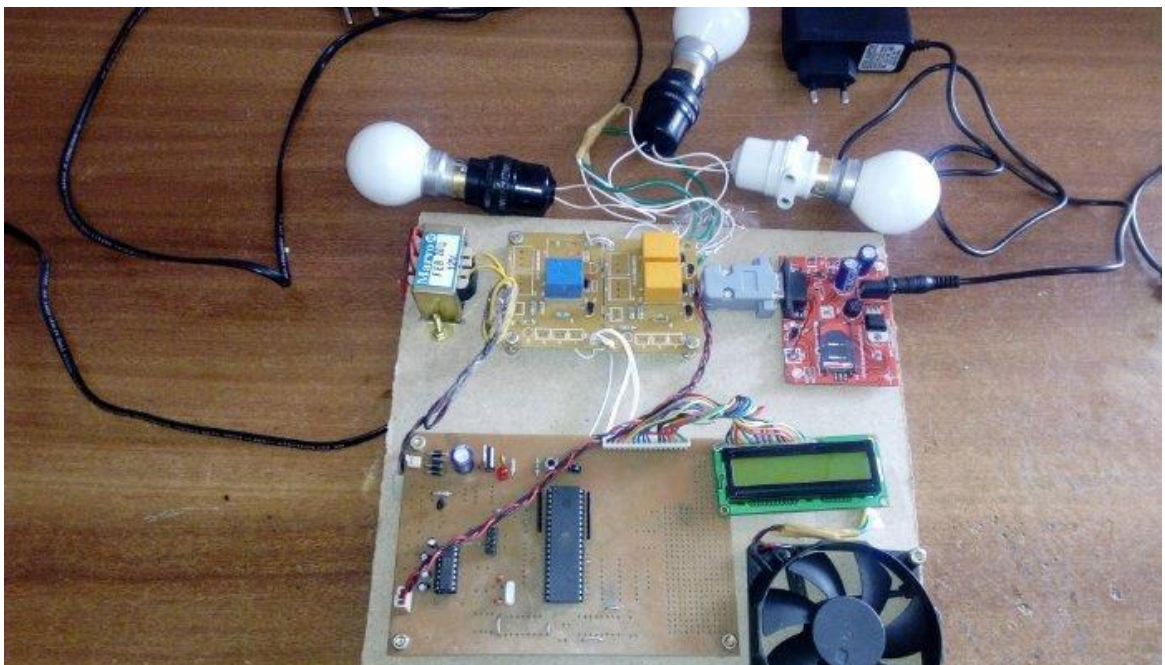
Figure 2: Methodology

Ours is a simplest smart automation system prototype which ranges from the controlling of electrical devices in the room to the attendance marking through facial recognition.

We have come up with the idea to develop an Android based application that would be pivotal for carrying out many jobs such as taking attendance and controlling the lighting of the room. This application would run on the local server with the help of the routers that needs to be installed in every class room and lecture halls. The faculty members would be accessing this application. Inter alia, there would be a camera that needs to be installed in class room for the attendance through the facial recognition. Apart from teaching flank there would be a role of system for students as well. The study material would be mailed to each and every student after a fixed span of time. The teachers would upload the material in a folder which they want to be accessed by the students.

- An Android based application would be the controlling tool along with the role of Raspberry Pi.
- A router in the room would be another requisite.
- The application would run on the local server provided with the help of this router
- A Raspberry Pi would be included in the switch control of the classroom.
- The lines of lights, fans and projector would be connected to the different pins in the Pi.
- The Android application would be used to command the Raspberry Pi with the help of which different objects would be controlled.
- Along with this a camera in room would also be linked to the application. On the command the camera would capture photo, repeating the process 5 times, that would be matched to the existing photos in the database and attendance would be marked

Chapter 3
SYSTEM DESIGN

3.1 Tools and Technologies used

3.1.1 Hardware Used

1. Raspberry Pi

Raspberry Pi is a sequence of small single board computers developed in the United Kingdom by the Raspberry Pi Foundation. It was released to encourage basic computer education in schools and developing countries. There are several generations of raspberry that were released. All models has a Broadcom Chip (SoC) system with included ARM processor and integrated graphics processing unit.

Figure 3: Raspberry Pi 3 Model B

FEATURES

• HARDWARE STORE

Raspberry Pi hardware has been transformed by many versions introducing variations in memory capacity and support around the device. Models A, A+, Pi Zero miss Ethernet and USB hub. In models A, Pi Zero and A +, the USB port is directly connected to the system on a single chip. In models Pi 1 Model B + and later, the USB and Ethernet chip enclose a five-point USB hub and four ports are available, While Pi 1 Model B provides only two ports.

• PROCESSOR

The Broadcom BCM2835(single chip) used in the first generation of Raspberry Pi is Somewhat same as the chip used in the first generation of modern smartphones. In form of graphics processing unit (GPU) and RAM. It has a level 16 (L1) cache of 16 KB and 128 KB of level 2 cache (L2). Level 2 cache is mainly used by the GPU.

• PERFORMANCE

Raspberry Pi 3, has Cortex-A53 quad-core processor, and is equivalent to 10 times the Raspberry Pi model 1 in terms of performance. Performance tests have shown Raspberry Pi model 3 is about 0.8(80%) times faster than Raspberry Pi model 2 in paralyzing activities. Raspberry Pi model 2 has a quad-core(Cortex-A7) processor with 900 MHz and 1 GB of RAM. He is explained as 4-6 times stronger than his predecessor. Raspberry Pi model 2 is up to 14 times faster than a Raspberry Pi Model B + in terms of parallel benchmarks.

• OVERCLOCKING

First and second generation Raspberry Pi CPU card does not require cooling, like a fan and heat sink, but problem of overclocking arises, Raspberry Pi model 3 generate more heat in overclocked. Most of the Raspberry Pi can be overclocked at 800 MHz, and where as some can be overclocked at 1000 MHz.

• RAM

On more seasoned Beta Model B cards, 128 MB was disseminated of course to the GPU, leaving 128 MB for the CPU. On the initial (and Model A) rendition and 256 MB model B, three unique divisions were conceivable. The default share was 192 MB (RAM for CPU), which ought to be sufficient for independent 1080p video deciphering, or for straightforward 3D. For the more up to date B display with 512 MB of RAM at first, there were new standard split memory documents discharged. The Raspberry Pi 2 and Raspberry Pi 3 have 1 GB of RAM. The Raspberry Zero W and Pi Zero have 512 MB of RAM.

• NETWORKING

The model A, Pi Zero and A + models don't support Ethernet circuit, and are commonly combined with a system utility such as USB or Wi-Fi connector. B and B + models, the Ethernet port is provided with an incorporated USB Ethernet connector exploiting the SMSC LAN9514 chip. The Raspberry Pi model 3 and Pi Zero are outfitted with WiFi 802.11n 2.4 GHz and Bluetooth 4.1in light of Broadcom BCM43438 Full MAC chip without official help for Monitor mode, however actualized by informal firmware settle.

Figure 4: Raspberry Pi 3Input -Output[8]

Power Pins: The header gives 5V on Pin 2 and 3.3V on Pin 1. The 3.3V supply is restricted to 50mA. The 5V supply draws current specifically from your microUSB supply so can utilize whatever is left finished after the board has taken its offer. A 1A control supply could supply up to 300mA once the board has drawn 700mA

Fundamental GPIO

The header gives 17 Pins that can be designed as information sources and yields. As a matter of course they are altogether designed as contributions with the exception of GPIO 14 and 15.

With a specific end goal to utilize these pins you should tell the frame work whether they are data sources or yields. This can be accomplished various ways and it relies upon how you mean to control them. I expect on utilizing Python**.**

Basic RASPBERRY PI CODE FOR INPUT OUTPUT

- Import RPi.GPIO as GPIO
- Use GPIO numbers instead of stick numbers GPIO. setmode(GPIO.BCM)
- set up GPIO channels - one information and one yield GPIO.setup(7, GPIO.IN)
- GPIO.setup(8, GPIO.OUT)
- input from GPIO7
- input_value =GPIO.input(7)
- yield to GPIO8 GPIO.output(8, True)

3.1.2 Software Used

1. Raspbian :

Raspbian is a Debian-based PC working framework for Raspberry Pi. Since 2015 it has been officially given by the Raspberry Pi Foundation as the vital working method for the group of Raspberry Pi single-board PCs. Raspbian utilizes PIXEL, Pi

Enhanced Xwindows Environment, Lightweight as its fundamental work area condition as of the most recent refresh. It is made out of an adjusted LXDE work area condition and the Openbox stacking window administrator with another subject and couple of different changes. The conveyance is delivered with a replacement of PC polynomial math program Mathematica and a form of Minecraft called Minecraft Pi and also a lightweight adaptation of Chromium as of the most recent rendition.

A working framework is the arrangement of fundamental projects and utilities that influence your Raspberry Pi to run. In any case, Raspbian gives in excess of an unadulterated OS: it accompanies more than 35,000 bundles, pre-aggregated programming packaged in a decent configuration for simple establishment on your Raspberry Pi.

The fundamental form of more than 35,000 Raspbian bundles, streamlined for finest execution on the Raspberry Pi, was finished in June of 2012. Be that as it may, Raspbian is still under dynamic progression with an accentuation on attractive the security and execution of whatever number Debian bundles as could reasonably be expected.

Figure5: RaspbianGui

2. MYSQL

MySQL is an open-source relational database Management framework. The MySQL improvement venture has impacted its source to code reachable under the stipulations of the GNU General Public License, and as well Under an menagerie of restrictive assertions.

MySQL is world's most famous open source database, empowering the practical. MySQL is world's most famous open source database, empowering the practical conveyance of dependable, elite and adaptable Web-based and inserted database applications. It is a coordinated exchange sheltered, ACID-agreeable database with full tender, rollback, crash recovery, and line level locking capacities. MySQL conveys the usability, flexibility, and superior, and in addition a full suit of database drivers and visual apparatuses to enable engineers and DBAs to manufacture and deal with their business-basic MySQL applications. MySQL is produced, disseminated, and bolstered by Oracle, and the most up to date data about MySQL programming can be establish on the MySQL webpage.

The MySQL database offers the following features:

• High performance along with the scalability to meet the needs of expanding data and user load.

• Self-healing clusters to get better the availability, performance, and usability.

• Changing the proposal online to deal with altering business needs.

• Performance measure to monitor user performance and application and resource use.

• SQL and NoSQL access to perform intricate queries and easy and fast key value operations.

• Platform Independence that gives you the resilience to build and install many operating systems.

• Big data interoperability with MySQL as a data store operation for Hadoop and Cassandra.

To attain the maximum level of security, scalability, reliability, and presence of MySQL, MySQL Enterprise Edition includes the widest range of management tools and superior features in addition to technical support including MySQL Enterprise Monitor and MySQL Enterprise Backup. and high accessibility features. MySQL Enterprise Edition also Involve the certification and product integration of Oracle Premier Support 24/7.

3.2 Design
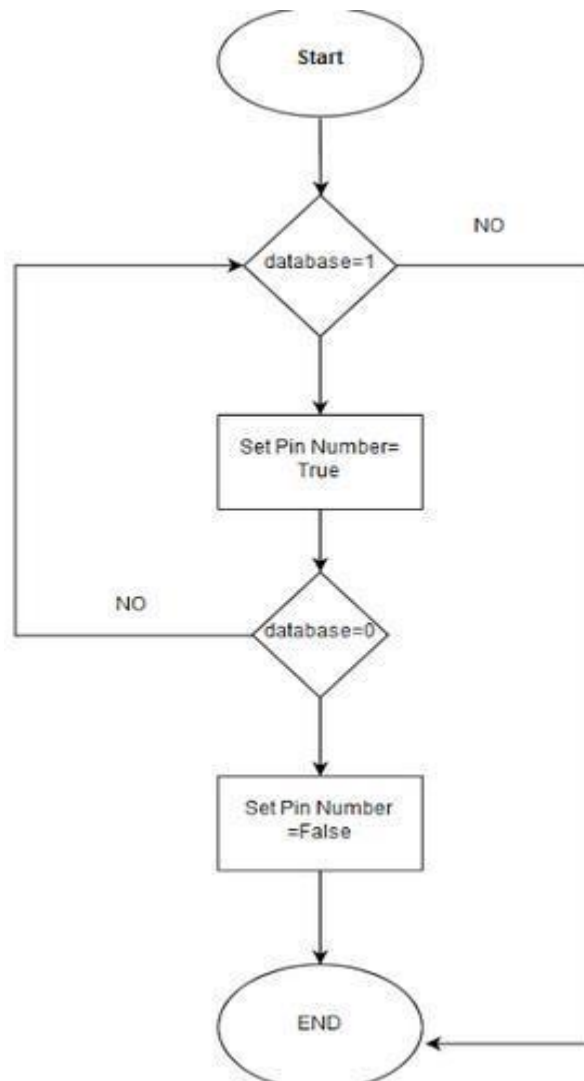
3.2.1   Light Controlling Module

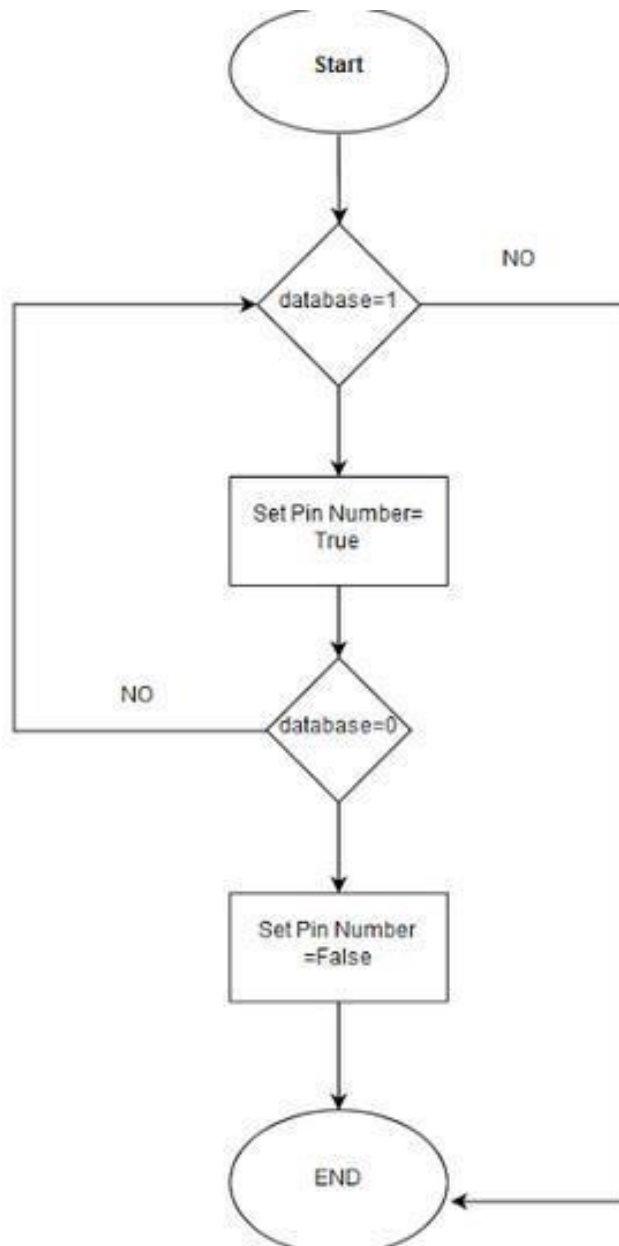**Figure 6: Light Controlling Module**

3.2.2 Fan Controlling Module

Figure 7: Fan Controlling Module

3.2.4 Attendance Marking Module:
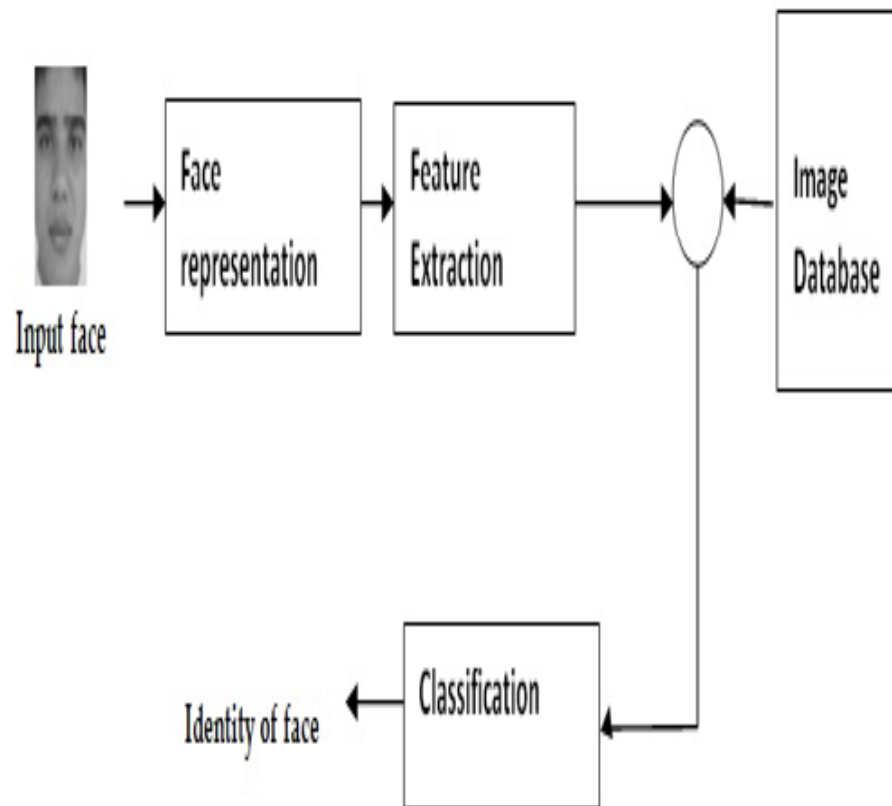

Figure 8: Attendance Marking Module

<div align="center">

Chapter 4

Algorithm

</div>

1. Light Controlling Module

User press the button on android app

Database updated to 1

Setup GPIO Pin for light

Read the database

If (database_light ==1):

while True:

    GPIO.output(PinNumber,True)

    Read the database

    If(database_light == 0)

        GPIO.output(PinNumber, False)

        Exit of loop

2. Fan Controlling Module

User press the button on android app

Database updated to 1

Setup GPIO Pin for FAN

Read the database

If (database_fan==1):

while True:

GPIO.output(PinNumber,True)

Read the database

If(database_fan == 0)

GPIO.output(PinNumber, False)

Exit of loop

3.   Projector Controlling Module:

User press the button on android app

Database updated to 1

Setup GPIO Pin for projector

Read the database

If (database_projector ==

1): while True:

GPIO.output(PinNumber,True)

Read the database

If(database_projector == 0)

GPIO.output(PinNumber, False)

Exit of loop

4.   Email Module:

Compress the folder as study.zip

Initialize sender mail id and password

msg .subject="Today's Study Material"

Read the database

for student in databse:

     server.sendmail(student,sender,study.zip)

exit the script

5. Attendance Marking Module:

a) Data set creation
- o faceDetect=cv2.CascadeClassifier('haarcascade_frontalface_default.xml');
- o assign roll number/id number to each data set
- o gray scale conversion
- o gray=cv2.cvtColor(img,cv2.COLOR_BGR2GRAY)

b) Train Data Set

recognizer.train(faces,np.array(Ids))

c) Detect faces in image
- For roll number data-set:
- detect = cv2.CascadeClassifier('haarcascade_frontalface_default.xml')
- font=cv2.cv.InitFont(cv2.cv.CV_FONT_HERSHEY_COMPLEX_SMALL,5,1,0, 4
- conf = rec.predict(gray[y:y+h,x:x+w])

Chapter 5:

RESULT AND PERFORMANCE ANALYSIS

Automatic Email:

Figure 9: Mailing Code

Data Set for Gesture :

FIGURE3.2:CAMBRIDGE HAND GESTURE RECOGNITION DATASET[59]
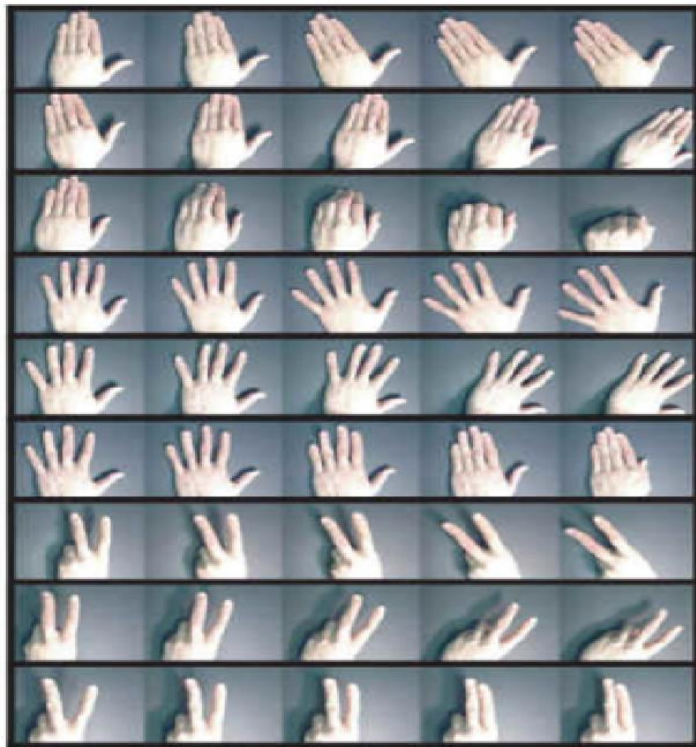
Data Set for Attendance:

Roll number: 1   Roll number: 3
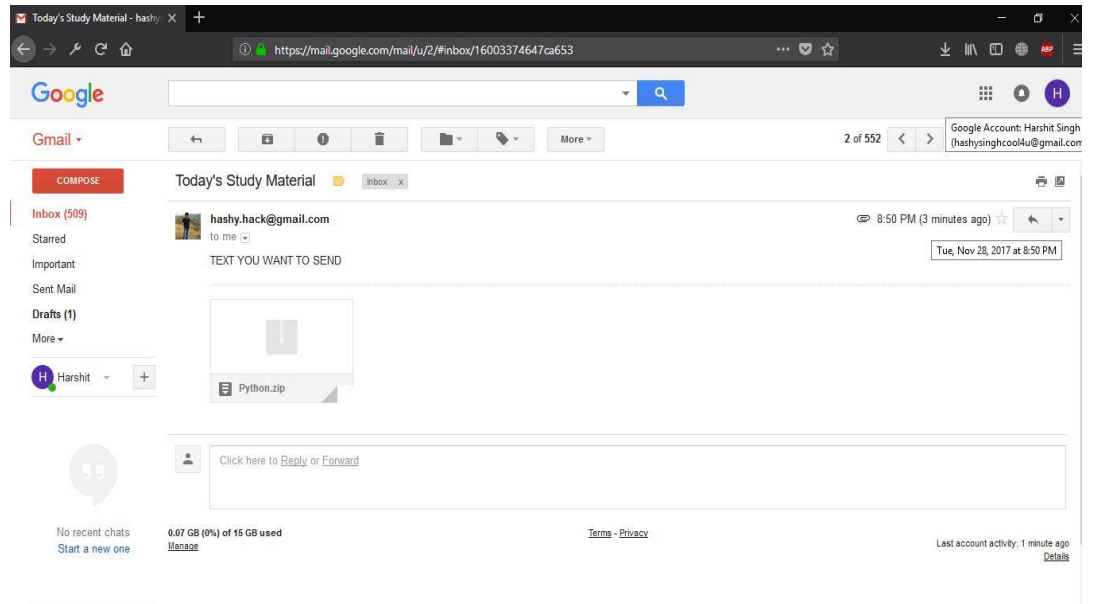
Figure 10: Data Set

Result:

Figure 11: Automatic Mail Result
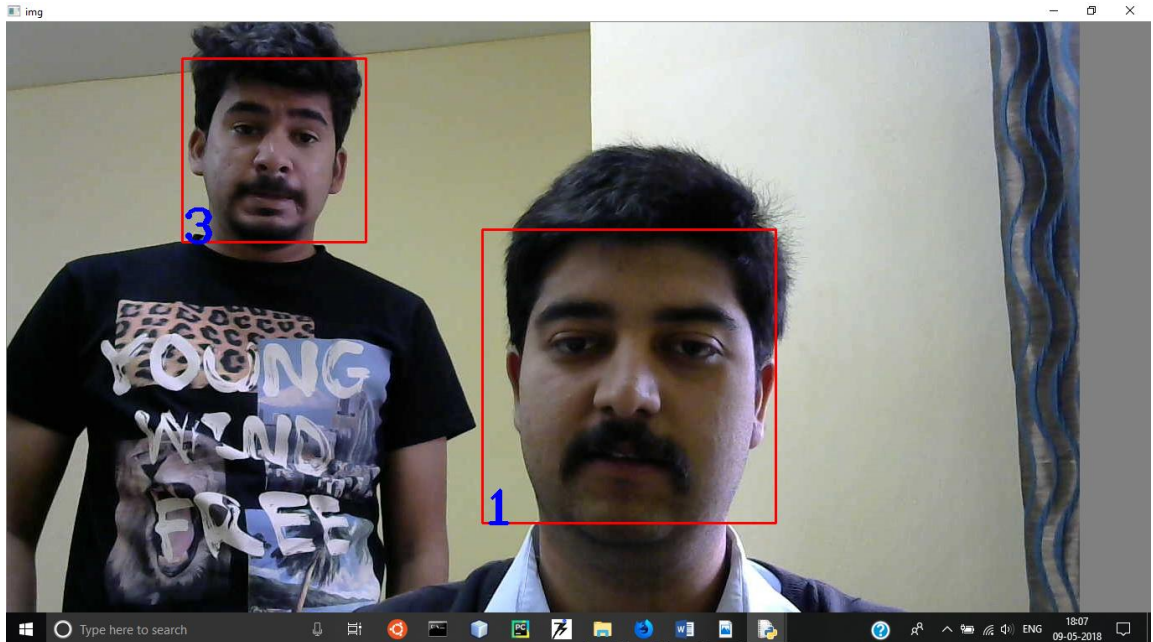
Attendance Marking:

Figure 12: Attendance Result

Chapter 6:
CONCLUSION

It has been experimentally proven that classroom automation using the Internet of Things is working satisfactorily by linking simple devices plus devices being effectively controlled. The planned system not only controls the light, the fans and the projector, but also takes the participation. This will help the teacher and students save time and focus on studying.

6.1 FUTURE WORK

The goal of the Smart Classroom is to make the use of the computer in the classroom simple, friendly and not intimidating as possible. In recent years, the utilization of distance education systems in all types has been mounting. One of the tools for the distance education system is perhaps intelligent classrooms, concurrent classroom environments. It is for that reason significant to increase the efficiency of the smart classroom to improve the remote learning environment education. The concept of BYOD is being piloted so that it can be used extensively.

Same Massive open online courses (MOOCs) are offered to give free rein to the use of technology in educational institutions.

The smart classroom market will grow

Technavio's momentum statistical surveying statement estimates that shrewd classroom showcase in India will grow up at a CAGR of more than 20% over the time of 2016-2020. As per the report, the activities that are taken by the Indian government would assume a noteworthy part in advancing brilliant learning tools. With the exponential increment in the utilization of day by day cell phones in India, schools, universities and the various instructive foundations could likewise try Present to Your Own Gadget (BYOD) approaches sooner rather than later. To maintain their computerized activities, educators additionally require programming so they can make e-learning content, which ought to empower interest for the learning items amid the conjecture period. The players with the

higher piece of the overall industry are Microsoft, Prophet, Samsung, Dell, Educomp, HCL Innovations, IBM, Lenovo and numerous others.

The Mobile learning applications - They are the future

Rather than the investigations, exams and the all the pressure behind this, learning through convenient gadgets, for example, cell phones, tablets and different gadgets is the thing that understudies are adapting now also, later on. The concept of m-learning should be an asset for the education sector in India.

Some of the mobile learning applications in present day are:

Microsoft OneNote - It looks like a traditional laptop, it scans interactive whiteboards. The notes instructors compose on the board go specifically into the journal they share with the understudies The most loved for taking notes at school, this application additionally enables educators to at the same time alter. With new highlights presented in as of late, understudies would now be able to compose notes, catch screen captures, and make a plan for the day.

Evernote - Evernote is an apparatus that is be utilized successfully on iPad. With its highlights to type, embed pictures, clarify and record sound, understudies can coordinate their iPad and cell phones from numerous points of view.

Chapter 7:
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