PROJECT REPORT

on

IOT BASED INTRUSION DETECTION SYSTEM

Submitted

by

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CERTIFICATE

This is to certify that, **Mr. Pranav Nitin Patade (ID- 181070906)** , a student of **B.Tech Degree in (Computer Engineering)** has completed project on **IOT BASED INTRUSION DETECTION SYSTEM** to our satisfaction.

Prof.Pranav Nerurkar
Guide

Ms.Suhasini Shukla
HOD-COMPS (VPM)

Date:
Place:

Declaration of the Student

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources.

I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea / data / fact / source in my submission.

I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Mr. Pranav Patade
(Reg no : 1810709) Date: _____

Abstract

The system is mainly based on: hardware sensing, network connectivity and remote user control over the system. Users can remotely monitor the current status of system and also can control it. If anyone tries to break through the system, the admin/user will receive an alert message as an EMAIL and SMS. User can deactivate activate the system via the website. This project of ours is being developed to help the user to achieve the security. Although many system are available very few has been actually implemented as fully functional single unit. This approach provides an easy to operate cost effective approach to obtain Smart Security.

Contents

Chapter 1

INTRODUCTION

1.1 BACKGROUND

The concept of smart home has been so popular nowadays. A Smart home can be viewed as an intelligent or automated home where the home appliances can be automated and monitored remotely. Security system is an essential part for any organization, Banks and homes .The goal is basically to protect individuals and property from various hazards such as fire, crime and loss.

1.2 EXISTING SYSTEM

According to the literature research, the common parameters or characteristics of home security system are 24 hours monitoring the intruders, ease of use, reliability, efficient, fast and precise notification system. Today numbers of home security systems are available in market, which guarantee to keep homes safe and secure. Existing CCTV systems provide 24*7 remote video surveillance of the house.

1.3 PROPOSED SYSTEM

Our main objective is to make a budget smart Home alert system which can provide security from almost every perspective. And which can be accessible remotely. The main objectives of the system are as follow: It provides safety from any kind of intrusion related activities. Provides safety from threats that can be caused due in case of fire. It provides live photographs whenever intrusion is detected. It will give you notification when intrusion is detected so that you may dont want to sit and observe CCTV of your home 24*7 as like in the existing system. The data can be stored in cloud for further references.

Chapter 2

FEASIBILITY

Feasibility study is conducted to determine quickly at a minimum expense how to solve a problem. It involves details of operation and management the system has been tested for feasibility in the following points:

2.1 TECHNICAL FEASIBILITY:

HARDWARE FEASIBILTY

o Why we Selected Raspberry Pi over Arduino?
An Arduino is a microcontroller motherboard. A microcontroller is a simple computer that can run one program at a time, over and over again. While A Raspberry Pi is a general-purpose computer, usually with a Linux operating system, and the ability to run multiple programs. Raspberry Pi, as explained earlier, has a full-fledged computing system. It usually has a Linux OS, more than 512 RAM, 32 GB SD Card, USB and HDMI ports.
1) Power Requirement- Raspberry Pi has comparatively lower power consumption
2) Development Languages- Arduino does not have an OS. So, coding and prototyping is done in C/C++ with the Arduino IDE. Raspberry Pi runs on an OS called Raspbian based on Debian Linux which lets you code in C/C++, Java, Python, .NET, PHP, NodeJS etc.
3) Entire Linux software stack is available.

4) It is very easy to connect to internet.

2.2 SOFTWARE FEASIBILITY

In the front end we used sensors while for reading the sensors data in raspberry pi we used python as programming language because,

1) Presence of Third Party Modules The Python Package Index (PyPI) contains numerous third-party modules that make Python capable of interacting with most of the other languages and platforms.
2) Extensive Support Libraries- Python provides a large standard library which includes areas like internet protocols, string operations, web services tools and operating system interfaces. Many high use programming tasks have already been scripted into the standard library which reduces length of code to be written significantly.
3) Open Source - Python language is developed under an OSI-approved open source license, which makes it free to use and distribute, including for commercial purposes.
4) Learning Ease Python offers excellent readability and uncluttered simple-to-learn syntax which helps beginners to utilize this programming language. The code style guidelines, PEP 8, provide a set of rules to facilitate the formatting of code. Additionally, the wide base of users and active developers has resulted in a rich internet resource bank to encourage development and the continued adoption of the language.

o In the backend we used PHP and MySQL server because,
1) Dynamic: Since PHP is a server side scripting language it creates dynamic pages with customized features. PHP provides a user-friendly and interactive website or web application and also enables visitors to freely interact while producing a very flexible and dynamic content.
2) Ease of use: PHP is very easy to learn as compared to the other programming

languages. The PHP syntax can easily be parsed. With its stability, PHP is sure to solve many problems with ease.
3) HTML embedded codes: PHP is no doubt a stable and cross-platform compatible language. And because of its ability to decode HTML, there is no need to have separate coding for PHP. This property comes with several other benefits such as: PHP can easily be incorporated into a code generated by WYSIWYG editors PHP can reduce the cost while increasing the efficiency of the websites or web applications With PHP, one does not have to rewrite every line of HTML in a programming language.
4) Cost effective: PHP is very cost-effective and never cost an extra dime. With a free license, you can be sure that no one will ask you to pay extra after developing the website. It is worth knowing that Apache/PHP/MYSQL combo runs perfectly well on a low cost, low end hardware that you can ever imagine for ISS/ASP/SQL Server.

2.3 ECONOMICAL FEASIBILTY:

As we mentioned earlier most of the technologies and programming languages we are using are open source i.e. free to use. As a result project cost is reduced hence become economically feasible.

Chapter 3

PROJECT DETAILS

3.1 REQUIREMENTS

SOFTWARE REQUIRMENTS (MINIMUM):

1. PYTHON 2.7.13
2. PHP 7.1
3. HTML 5

HARDWARE REQUIRMENTS:

1. RASPBERRY PI 3 MODEL B
2. ANDROID PHONE
3. SENSORS (PIR , IR , FLAME SENSOR)
4. POWER BANK
5. CAMERA
6. INTERNET CONNECTION

3.2 CHARTS

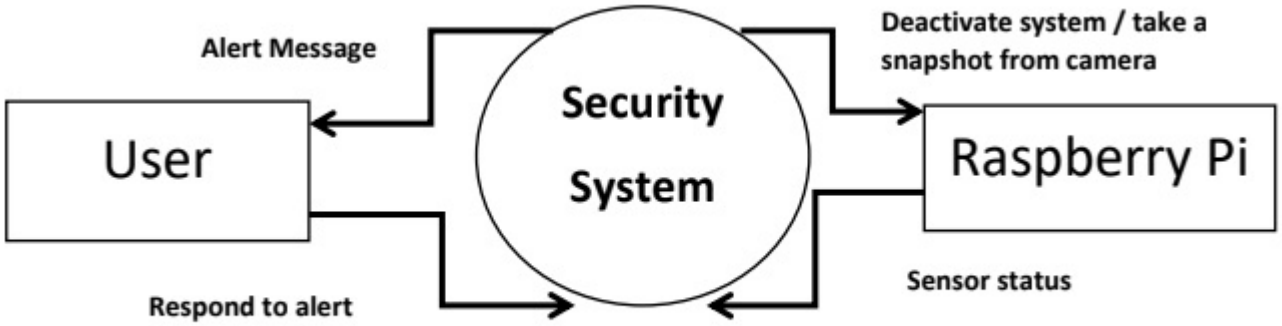

Fig.4.1 DFD

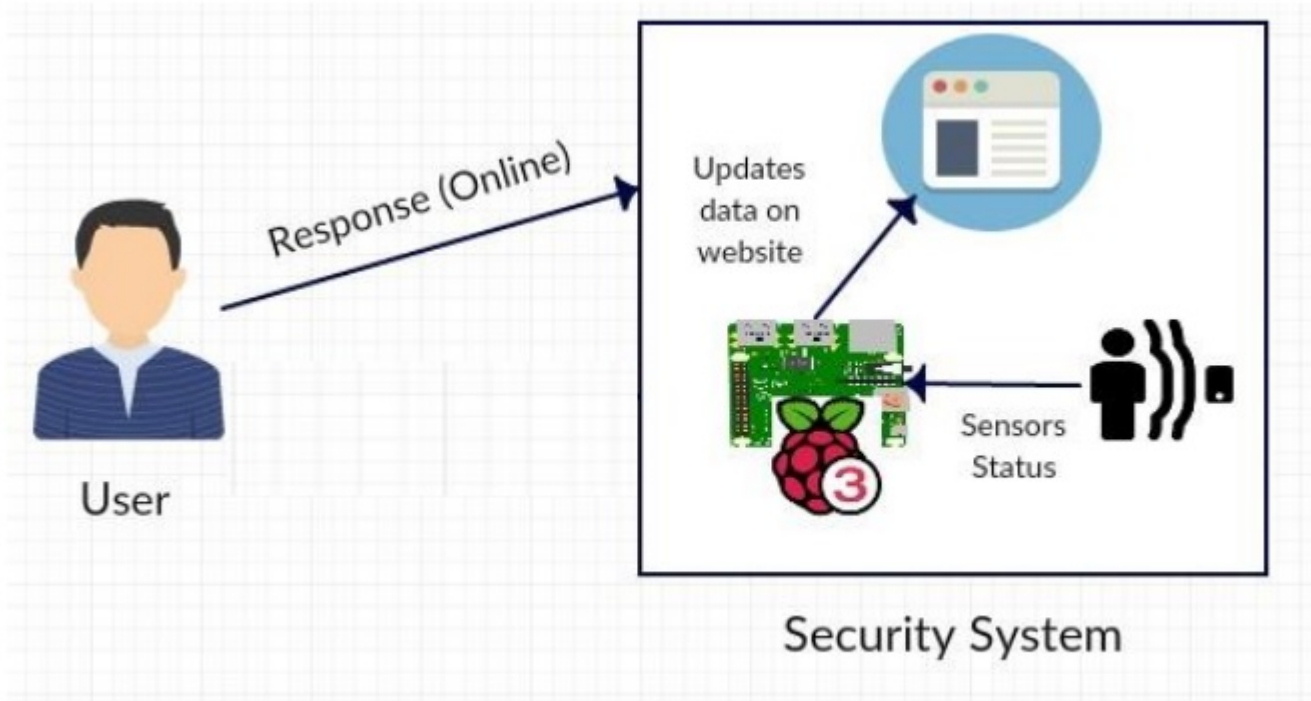

Fig4.2 USE CASE

	AUG		SEP			OCT		NOV		DEC		JAN			FEB		
	1	31	1	15	30	1	31	1	30	1	31	1	15	31	1	15	28
Information Research	→																
Planning			→														
Designing				→													
Modeling						→											
Coding								→		→		→					
Testing														→			
Completion															→		

Fig.4.3 Gantt chart

Completed

Incomplete

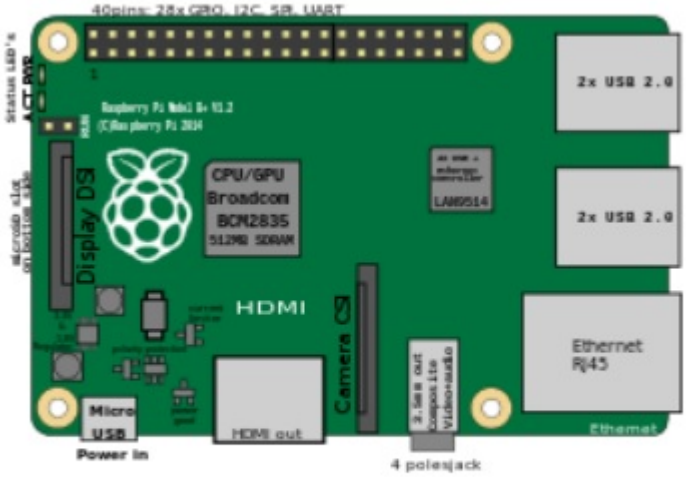

Fig.5.4 Block Diagram of Raspberry Pi 3

[?]

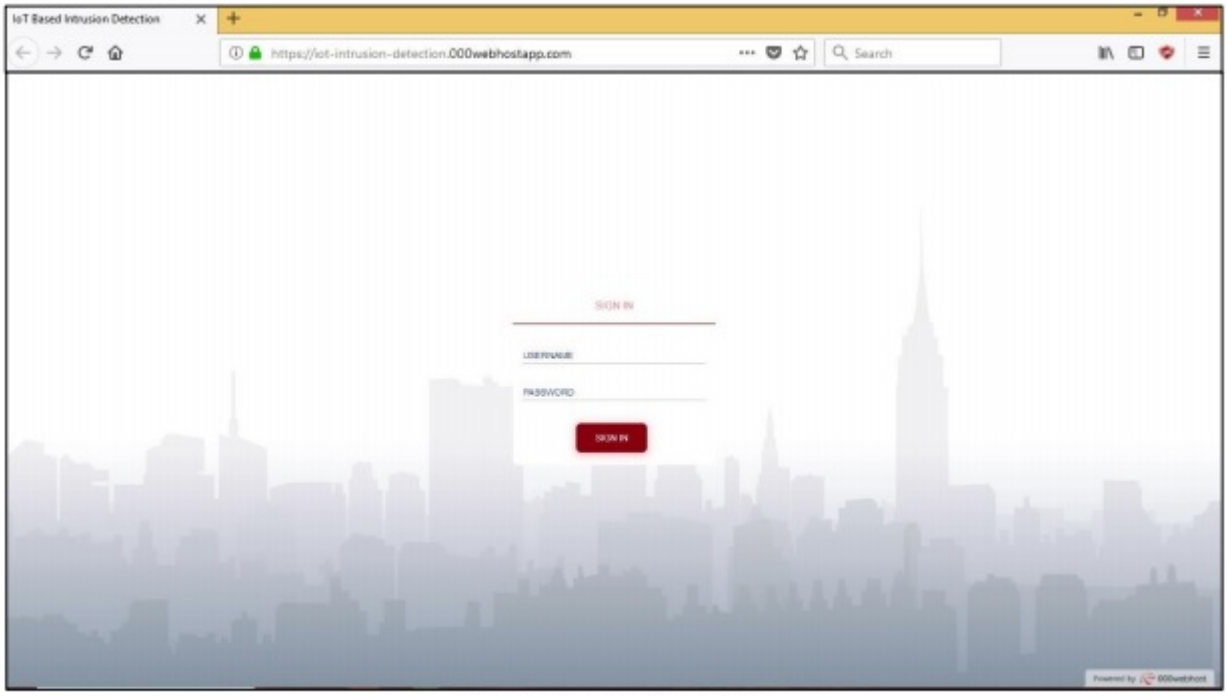

Fig. 5.5 HOMEPAGE

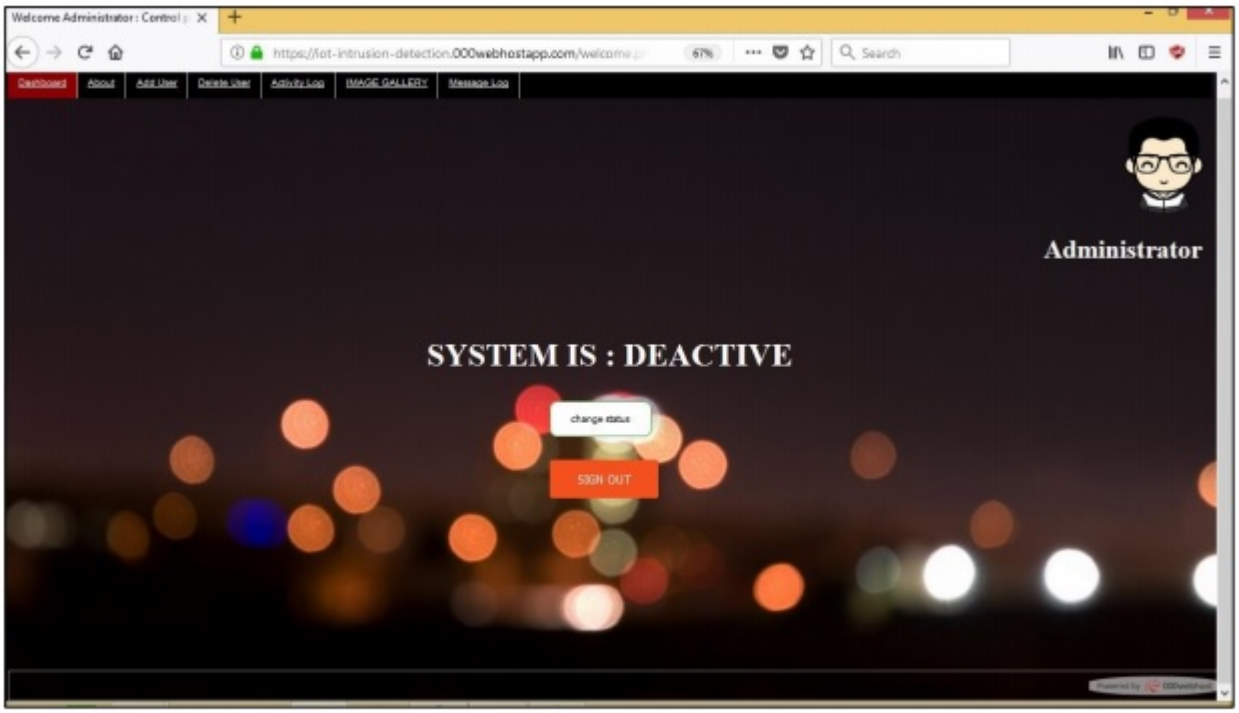

fig. 5.6 WELCOME PAGE

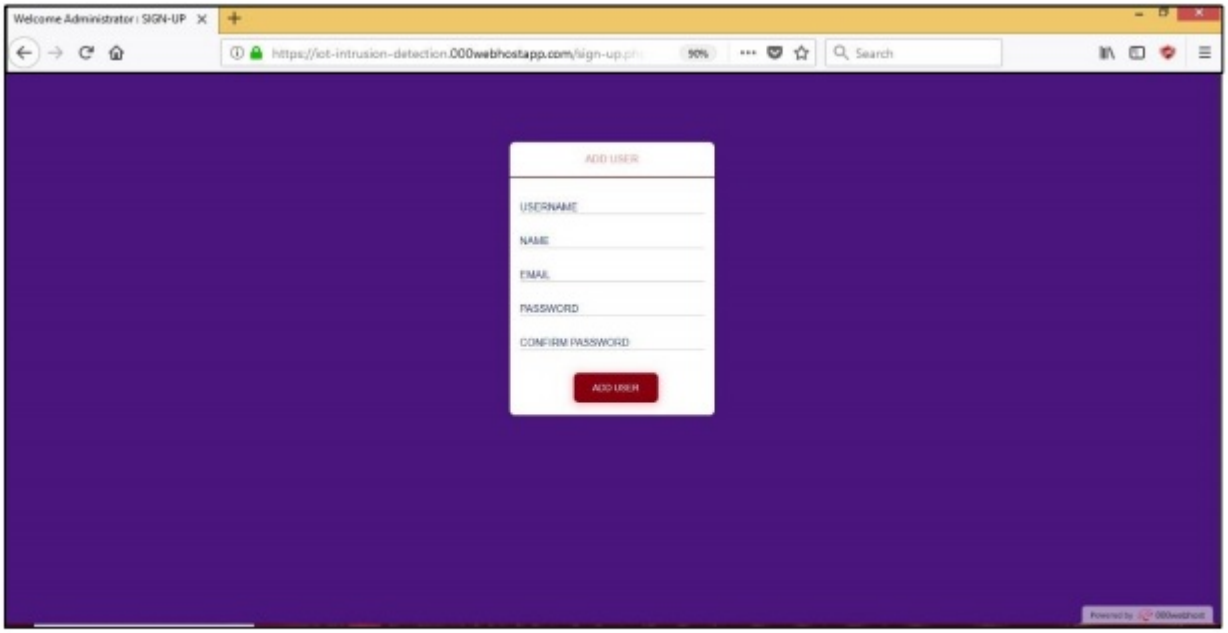

Fig. 5.7 ADD USER

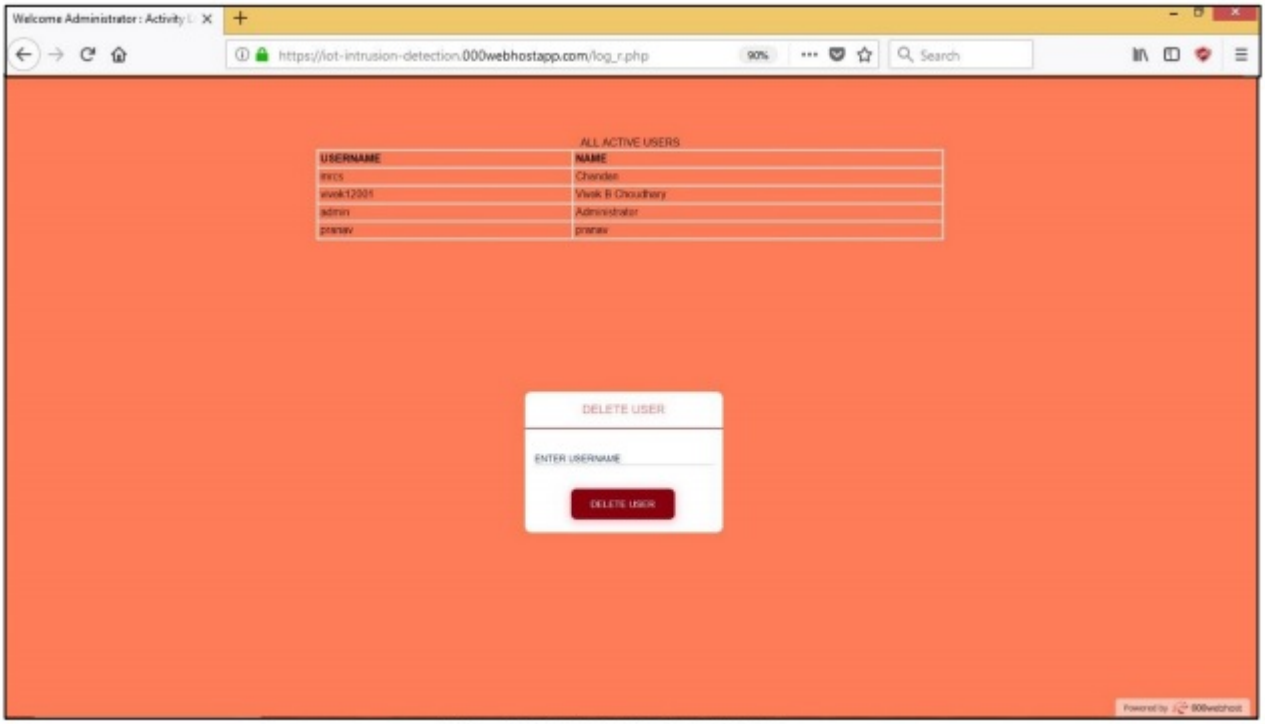

Fig. 5.9 DELETE USER

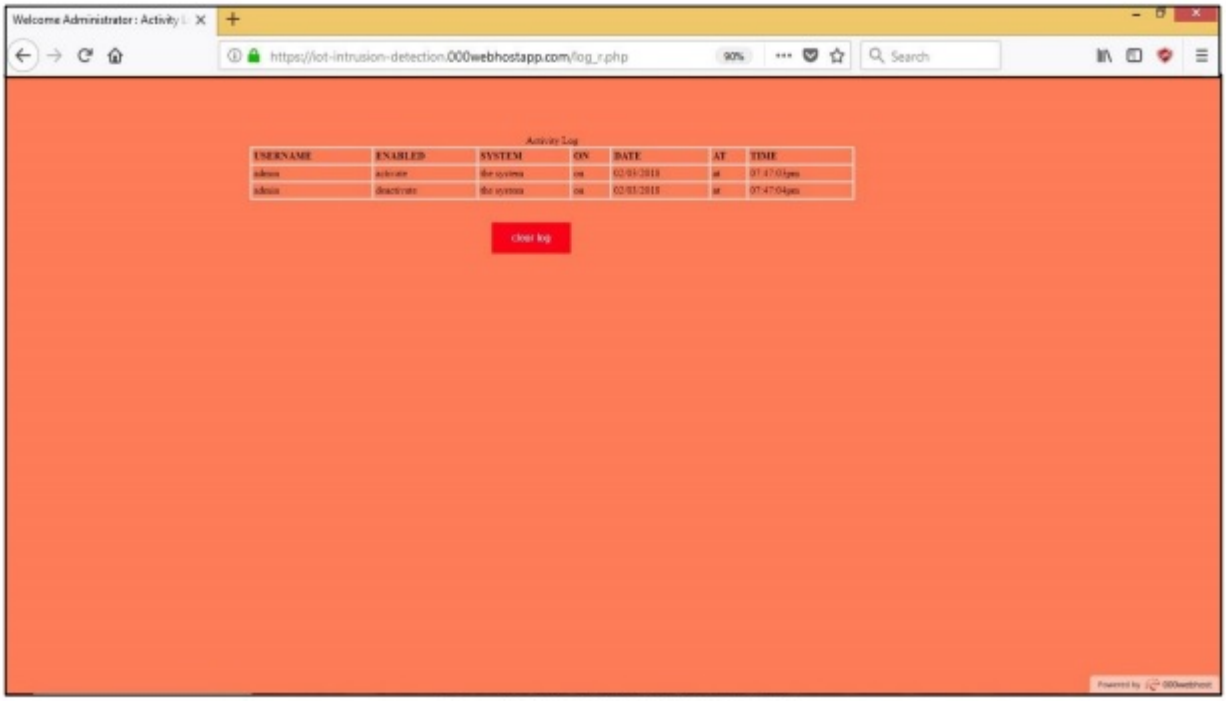

Fig. 5.8 ACTIVITY LOG

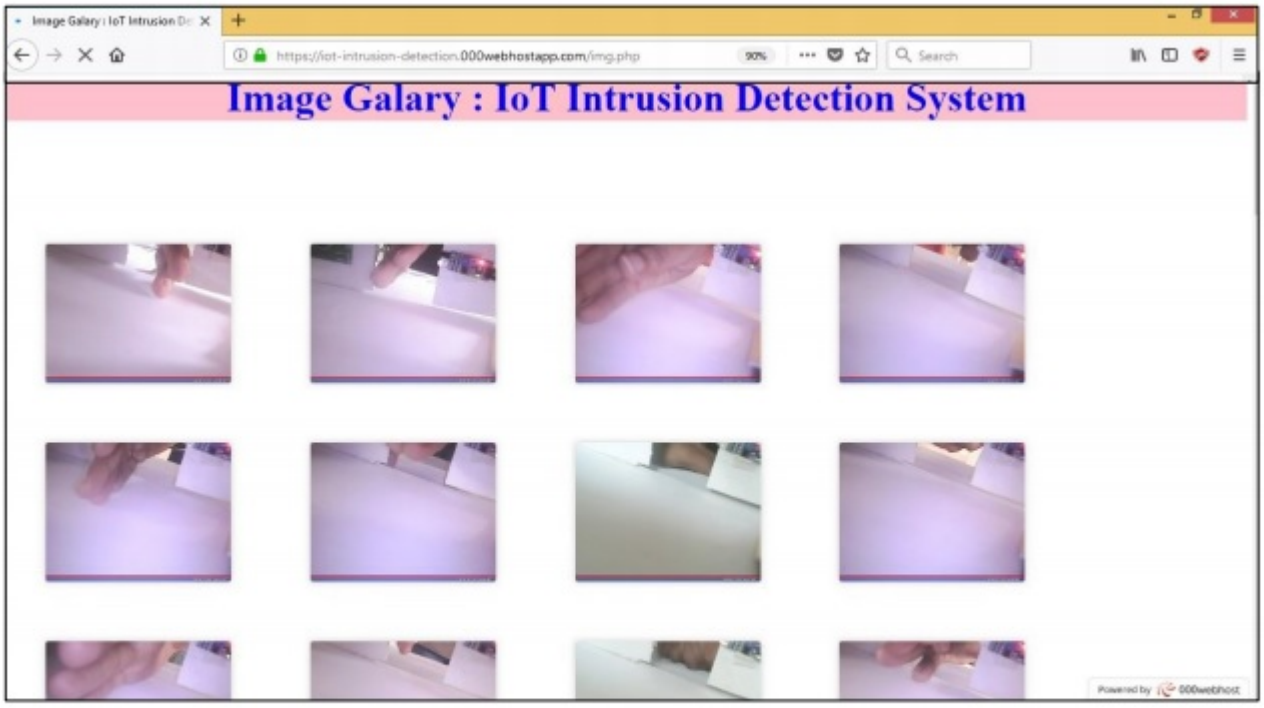

Fig. 5.10 IMAGE GALLARY

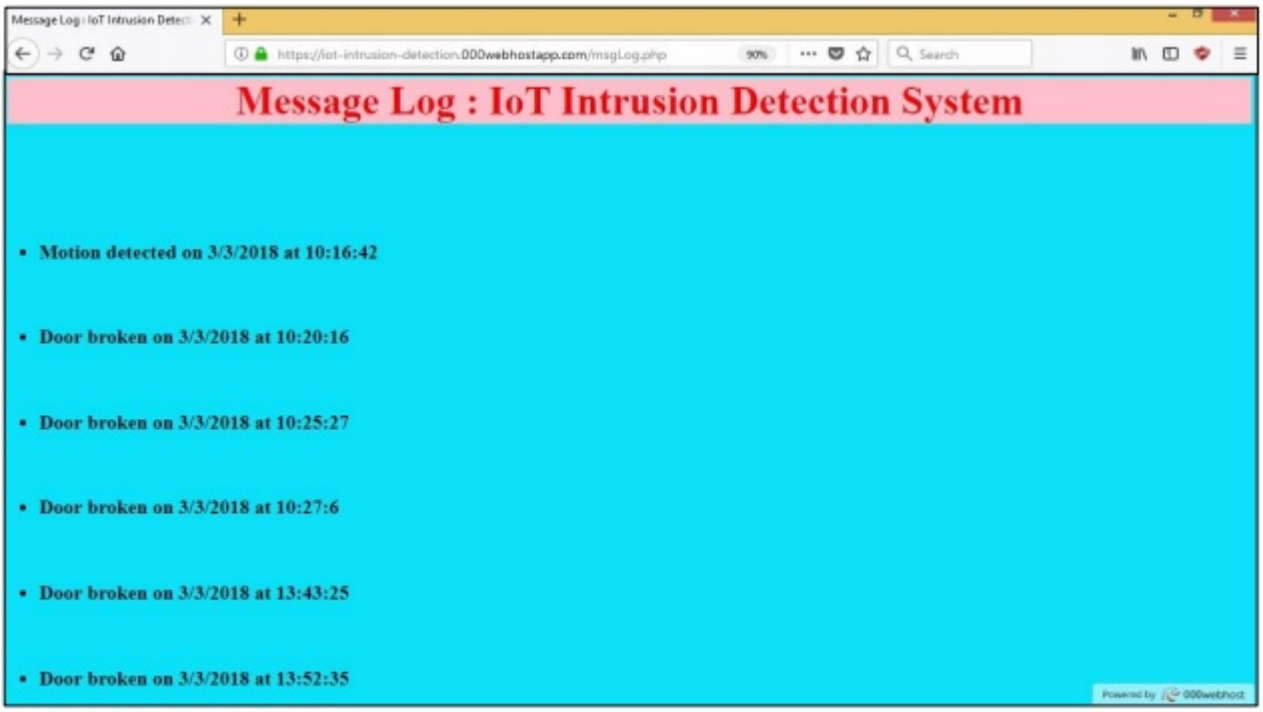

Fig. 5.11 MESSAGE LOG

5.3 ALERT IMAGES

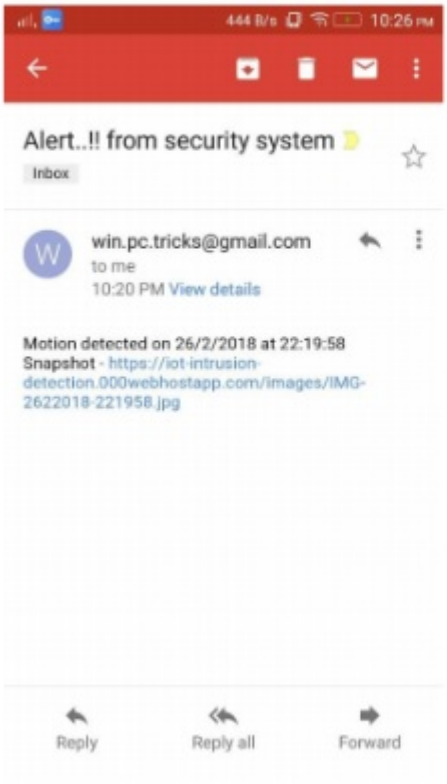

Fig 5.15 EMAIL ALERT

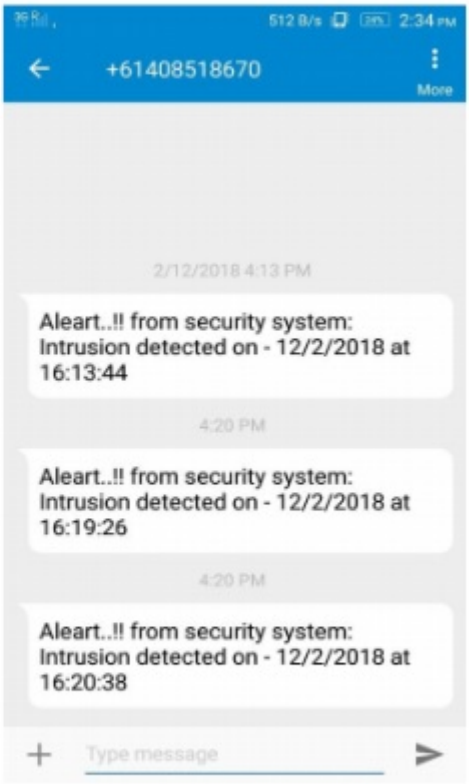

Fig 5.16 SMS ALERT

5.4 INTRUSION IMAGE

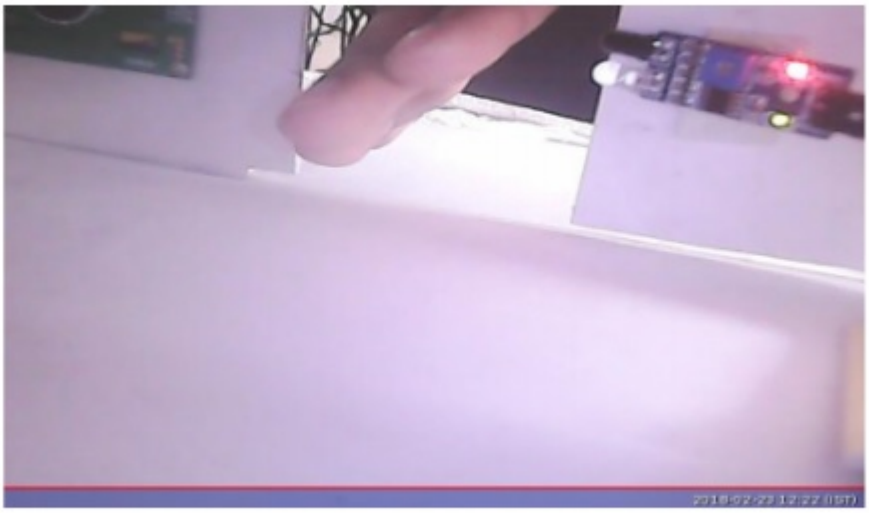

Fig. 5.17 INTRUSION DETECTED BY IR SENSOR (DOOR BREAK)

5.2 ANDROID APP (SCREENSHOTS) & PROTOTYPE:

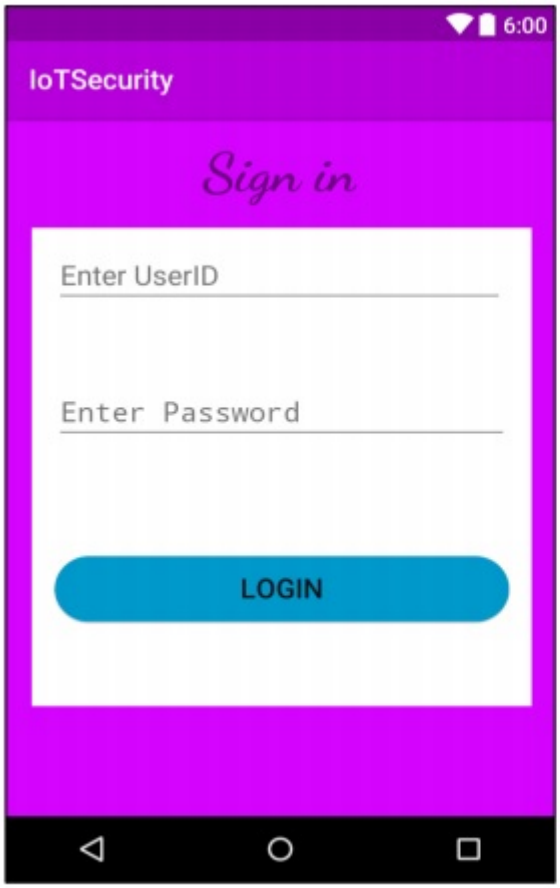

Fig. 5.12 SIGN IN

Fig. 5.13 WELCOME

Fig 5.14 WORKING PROTOTYPE

3.3 TESTING

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SOFTWARE TESTING

Software testing is the process of evaluation a software item to detect differences between given input and expected output. Also to assess the feature of a software item. Testing assesses the quality of the product. Software testing is a process that should be done during the development process. In other words software testing is a verification and validation process

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TYPES OF TESTING

There are many types of testing like :

1. **Unit Testing** / Testing Individual component of system
2. **Integration Testing** / Testing interfacing of system
3. **Functional Testing** / Testing each and every functionality in system
4. **System Testing** / Testing complete input and output of system
5. **Beta Testing** / Demo testing of working of software.

3.3 TEST CASES

SR NO	TEST CASE ID	TEST CASE OBJECTIVE	PREREQUISITE	STEPS	INPUT DATA	EXPECTED RESULT	ACTUAL RESULT	STATUS
WEBSITE								
UNIT TESTING & GUI TESTING								
1	TC_01	To check login field	Website is open	Enter valid username and password	admin admin123	Login should be successful	Login Is successful	**PASS**
2	TC_02	To check activation/ deactivation button	Website is open	click on "change status" button	-	System should activate and deactivate	System is activated or deactivate	**PASS**
3	TC_03	To check 'add user' option	Website is open	Click on 'add user' option Fill information in the fields	mrcs chandan chandanshinde9@gmail.com admin123	User should be created	User is created	**PASS**
4	TC_04	To check 'delete user' option	Website is open	Click on the 'delete user' option Enter username	mrcs	User should be deleted	User is deleted	**PASS**
5	TC_05	To check 'activity log' option	Website is open	Click on the 'activity log'	-	Activity log should be displayed	Activity log is displayed	**PASS**

6	TC_06	To check 'message log' option	Website is open	Click on 'message log' option	-	Message log should be displayed	Message log is displayed	**PASS**
7	TC_07	To check 'image gallery' option	Website is open	Click on 'Image Gallery' option	-	Image Gallery should be displayed	Image Gallery is displayed	**PASS**
8	TC_08	To check 'sign out' button	Website is open	Click on 'sign out' option	-	Account should be sign out	Account is sign out	**PASS**

SYSTEM TESTING								
9	TC_09	To check all functions of website are correct	Website is open	Check every option in the website	-	All options should work correct	All options work correctly	**PASS**

ANDROID APP								
UNIT TESTING & FUNCTIONALITY TESTING								
1	TC_01	To check login fields	Android app is open Internet connection is working	Enter username and password	Admin Admin123	Login should be successful	Login is successful	**PASS**
2	TC_02	To check 'check status' option	Android app is open Internet connection is working	Click on 'check status' option	-	Status should be retrieved And displayed	Status is retrieved And displayed	**PASS**
3	TC_03	To check 'change status' option	Android app is open Internet connection is working	Click on 'change status' option	-	Status should be changed	Status is changed	**PASS**
4	TC_04	To check 'Panic call' button	Android app is open Internet connection is working	Click on 'panic call' option	-	Call should be sent	Call is sent	**PASS**
5	TC_05	To check 'WhatsApp' button	Android app is open Internet connection is working	Click on 'WhatsApp button'	-	WhatsApp should be opened	WhatsApp is opened	**PASS**

6	TC_06	To check 'website view' button	Android app is open Internet connection is working	Click on 'website view' button	-	Website should open	Website is open	**PASS**

SYSTEM TESTNG								
7	TC_07	To check Complete android app is working correctly And performing all functionality	Android app is open Internet connection is working	Check each and every Options in the android app	-	Android app should work correctly	Android app worked correctly	**PASS**

HARDWARE SYSTEM								
UNIT TESTNG								
1	TC_01	To check 'system on/off'	Raspberry Pi must be powered on	Run the main script from terminal	-	System should get ON	System is ON	**PASS**
2	TC_02	To check 'LCD display'	Raspberry Pi must be powered on	Run the main script from terminal	-	Display should be ON	Display in ON	**PASS**
3	TC_03	To check 'IR sensor'	Raspberry Pi must be powered on	Run the main script from terminal	-	Sensor should get ON	Sensor is ON	**PASS**
4	TC_04	To check 'Flame sensor'	Raspberry Pi must be powered on	Run the main script from terminal	-	Sensor should get ON	Sensor is ON	**PASS**
5	TC_05	To check 'camera' module	Raspberry Pi must be powered on	Run the main script from terminal Make intrusion	-	Camera should get ON	Camera is ON	**PASS**
6	TC_06	To check 'Red LED'	Raspberry Pi must be powered on	Run the main script	-	LED should get	LED is light up	**PASS**

				from terminal		light up		
7	TC_07	To check 'Yellow LED'	Raspberry Pi must be powered on	Run the main script from terminal	-	LED should get light up	LED is light up	**PASS**
8	TC_08	To check 'Green LED'	Raspberry Pi must be powered on	Run the main script from terminal	-	LED should get light up	LED is light up	**PASS**
9	TC_09	To check 'Buzzer'	Raspberry Pi must be powered on	Run the main script from terminal	-	Buzzer should ring	Buzzer is ring	**PASS**
10	TC_10	To check 'EMAIL Alert'	Raspberry Pi must be powered on Internet is working	Run the main script from terminal Make intrusion	-	Alert should be send	Alert is send	**PASS**
11	TC_11	To check 'SMS Alert'	Raspberry Pi must be powered on Internet is working	Run the main script from terminal Make intrusion	-	Alert should be send	Alert is send	**PASS**

INTEGRATION TESTNG & SYSTEM TESTING								
12	TC_12	To check System is getting activated/de activated through both android app and website	Raspberry Pi must be powered on Internet is working Website is open Android app is open	Run the main script from terminal Enter username and password and perform login Activate/ Deactivate the system	-	System should get activate/ deactivate	System should getting activate/ deactivate	**PASS**

Chapter 4

Other Details,Future Scope and Applications

FEATURES & ADVANTAGES

- **FEATURES**
  - Security to your home
  - Password protection
  - Sensor based alarm system
  - Both EMAIL(Online) & SMS(Offline) alerts

- **ADVANTAGES**
  - Your smartphone can be used as your 'Sensing Assistant'
  - No need for security cameras as each and every movement you can sense because of the sensors.
  - Crime, or the chances of theft reduces because of the quick alarm systems and inter connectivity notifications.
  - You can get improved performance because of the fast technological aspects.

APPLICATIONS

- Sensors and actuators to sense regarding Digital Nervous System.
- All such inputs are digitized & because of connectivity, they placed onto networks and so you can get notifications on time.
- All networked inputs can then be combined with integrated data, people, processes and systems for fast and better decision making.
- Let's take an example :

  If you have a family member who needs supervision, and he is all alone at home, but there are home sensors attached everywhere, then you don't need to worry much. If any kind of abnormal activities are detected, just because of the sensors, the alerts are automatically sent

FUTURE SCOPE

- To enable video surveillance feature.
- Password for system deactivation (offline).
- App for iOS
- Implement more sensors including smoke sensor, vibration sensor etc.

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