SMART SECURITY SYSTEM FOR AN ORGANIZATION

BY

Moyazzem Hossain

ID: 151-15-4954

Fahad Uddin akash

ID: 151-15-4800

This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering.

Supervised By

Dr. Fernaz Narin Nur
Assistant professor
Department of CSE
Daffodil International University

Co-Supervised By
Ms.Nazmun Nessa Moon
Assistant Professor
Department of CSE
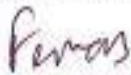Daffodil International University

DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

MAY2019

DECLARATION

We hereby declare that this project has been done by us under the supervision of **Dr. Fernaz Narin Nur**, Assistant professor Department of CSE Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

Supervised by:

Dr. Fernaz Narin Nur
Assistant professor
Department of CSE
Daffodil International University

Co-supervised by:

Ms.Nazmun Nessa Moon
Assistant Professor
Department of CSE
Daffodil International University

Submitted by:

Moyazzem Hossain
ID: 151-15-4954
Department of CSE
Daffodil International University

Fahad uddin akash
ID: 151-15-4800
Department of CSE
Daffodil International University

APPROVAL

This Project titled "smart security system for a organization", submitted by Moyazzem Hosaain and Fahad Uddin akash , ID No: 151-15-4954 and 151-15-4800 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 2nd May 2019.

BOARD OF EXAMINERS

Dr. Syed AkhterHossain   **Chairman**
Professor and Head
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Md. Tarek Habib   **Internal Examiner**
Assistant Professor
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

MoushumiZaman Bonny   **Internal Examiner**
Senior Lecturer
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Dr. SwakkharShatabda   **External Examiner**
Associate Professor
Department of Computer Science and Engineering
United International University

ACKNOWLEDGMENT

First we express our heartiest thanks and gratefulness to almighty God for His divine blessing makes us possible to complete the final year project successfully.

We really grateful and wish our profound our indebtedness to Dr. Fernaz Narin Nur, Assistant professor, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of "Data mining and image processing, Programming and problem solving" to carry out this project. Her endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior draft and correcting them at all stage have made it possible to complete this project.

We would like to express our heartiest gratitude to Dr. Fernaz Narin Nur, Assistant professor, Department of CSE, and Professor Dr. Syed Akhter Hossain, Head**,** Department of CSE, for his kind help to finish our project and alsoto other faculty member and the staff of CSE department of Daffodil International University.

We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, we must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

We have developed a project, titled "smart security system is an open cv Arduino based system". We implement this optionI use open cv numpy and Arduino etc. In there is also a future plan for making security system for it. The 21th century turn out to be self-controlled and automated because of comfort, Includes security lock everything. The "Smart Security System" give us the idea of giving security in our real life by image processing. Whenever a person will come at first we check the person. Using this system we can easily check person if a known person will come then the system automatic open on the other hand unknown person will come the system con not open because it can not identify the person. For identify the person this system will stored the data . In that time the owner of the house observe the system so the system will be is a popular system also attractive performance to all. So it will be good future for this system.

TABLE OF CONTENTS

CONTENT	PAGE NO

LIST OF FIGURES

CHAPTER 1
INTRODUCTION

1.1 Introduction

Smart security system is a most important in our daily life. This system is an option such as a security system. This system is automated system. Now our world is mostly converted to automated system that system makes our life easier. To open the door we have no need to control the door. Its automatically open & close. In this system it first check human face then it is check the data which is stored in memory if it will match the face it will open the door if it cannot detect face or mismatch its face it will not open the door also give a signal to the owner of the properties.

This system can also provided every kind of security in any home, business place, restricted area, industry etc. In the 21st century the secure system is most important for human safety and safe our property.

So it is the most important & essential part for our life and secure the all kind of things.

1.2 Motivation

For the various kind of people are organized from the many cites for the many reasons. As like as when peoples are go to their office, college, university, school and various kind of places for a long time. In that time they will face a security problem for their home. So we will think the system. In that we realized that we have to do something so we find out security system. This security system is most useful for us. When we are outside from our home in that time my family member or collude need to enter the home or office but he have no key to enter the home or office. In this he must wait for the owner. If use the system he will not wait because when he come to home or office if his face is saved here the door will automatically open and collect his important things. It will save our time and save our property so it is a most important.

This system idea has been proposed to the utilized. This system give maximum

ensured   the structured system. Now we use key open the door which is not secure because we know master key. Master key is a one kind of key which can open all kind of lock. So lock is not secure. If we using the technology we can secure everything. This technology makes our life so easier and more comfortable.

1.3 Objective

1. The photo will be taken by a camera process converting, cropping and resizing.
2. It will perform dedication and recognized the face to open the door.
3. It wills storage data in its memory to taking photo.
4. If the person will known to the owner the owner can easily pass code through using keypad.

1.4 Expected Output

1. Easy way to secure everything.
2.   It is also easy and effective way to secure the whole system.
3. Using this system the owner can easily notify the secure system.
4. Using this system the owner can easily take proper way to secure the system.
5. Using this system it will make easy our life to secure.

6. using this system make our life so easier and comfortable

1.5 Report Layout

The report is compressive six chapters. In this report the layout is summarized by five chapters. Summarized of the layout is now given below:

In the chapter one it gives the introduction with a short description of smart security system, data analysis and motivation. In the introduction we will describe about motivation, goal and expected outcome of the project. In the second chapter we will describe about background of the project, related works, future scope of the project and related work, data analysis and discussion of the problem. In the third chapter we highlight the requirement on both software and communication. Research methodology includes in chapter three. In this chapter contains Research subject and

Instrumentation, Data collection procedure, statistical analysis and implementation requirements. In chapter four we will describe about result, discussion and data analysis. In chapter five we will describe about conclusion, recommendation, implantation and future research.

CHAPTER 2
BACKGROUND STUDY

2.1 Introduction

Smart security system is a most important in our daily life. This system is an option such as a security system. This system is automated system. Now our world is mostly converted to automated system that system makes our life easier. To open the door we have no need to control the door. It's automatically open & close. In this system it first check human face then it is check the data which is stored in memory if it will match the face it will open the door if it cannot detect face or mismatch its face it will not open the door also give a signal to the owner of the properties.

In our life internet is the most important thing. Using this internet we can easily made supportive gadget for the human. Technology will develop day by day. Technology is a piece of our life step by step like as human nourishment. The first stage is face dedication and face reorganization. The success is depends on the face reorganization process. During research this process is proportional to the numberless of solution.

In day by day man are depends on the machine and internet in this period correspondence bound with machine which is represented by internet of things (IOT). In this case the security issue is so exclusive and imperative for human being.

2.2 Related works

The smart security system we making a unique to others but there is some security system is similar to my project but that has much limitation. But our project is less limitation. The smart security system which we make its efficiency is so high than any other system. Its secure system is higher than other system which is I visited. We also show that it is most important this system not access in Bangladesh. Many schools, college, use this security but their security is different from our project their system is automated if any person is want to enter their institute they can easily enter because their door is automated but not secure. So many crimes are occurring here.

After deciding to build this android application, we looked through online and found no such site or app that is like ours. However, there are apps which have some similar features like us but not a complete one. There are some apps where people can find such

features like us. But ours other features are not present there. The prediction for flood must be different from others app. We just make it happen in one app. It will work both for general people and also for Government to take step earlier.

Various smart systems have been proposed and consist of different technologies and appliances. In the research [13] the authors present the design and implementation of a low cost home automation system. The system is implemented with Arduino BT card (as a 8-bitmicrocontroller board based on the ATmega168) and the appliances are connected to the input /output ports of this card via relays. The communication between the cellular phone and the Arduino BT card is wireless. For the cell phone script is written in Python, it is portable and can run on any platform of the Symbian operating system. This Python script communicates with the Arduino BT board and sets up an ad-hoc communication protocol between the two devices, which allows controlling the behavior of the Arduino BT board.

2.3 Comparative Studies

The most important and initial part is security. For security issue the institute wants secure that. The most important issue public or private institutions various security systems have been proposed and developed for some process as person identification, verification. For research we want to need more numerous applications for face reorganization. So most important part is security system development with the potential application for door access control this system must be focuses on the study and development face recognition system. Face recognition system developed purposely built for door access control. So we have to need to update the security system .We build a simple and user friendly app for an admin and also for user. Our main focuses to feel them good. This is important that everybody can find what they are looking for in this app easily and for the admin it should be very simple to understand the scenario.

2.4 Scope of the Problem

1. Real time image capture

2. that is online supported not offline

3. This is not supported for android version

4. That is only for arudino base supported

2.5 Challenges

1. In this system we use a large database
2. Updating database
3. Live face image
4. High definition image capture
5. Time scheduling capture
6. Face requirement
7. Poor communication
8. Skill development

CHAPTER 3

IMPLEMENTATION OF THE PROPOSED METHODOLGY

3.1 Introduction

Smart security system is a most important in our daily life. This system is an option such as a security system. This system is automated system. Now our world is mostly converted to automated system that system makes our life easier. To open the door we have no need to control the door. It's automatically open & close. In this system it first check human face then it is check the data which is stored in memory if it will match the face it will open the door if it cannot detect face or mismatch its face it will not open the door also give a signal to the owner of the properties.

In our life internet is the most important thing. Using this internet we can easily made supportive gadget for the human. Technology will develop day by day. Technology is a piece of our life step by step like as human nourishment. The first stage is face dedication and face reorganization. The success is depends on the face reorganization process. During research this process is proportional to the numberless of solution.

In day by day man are depends on the machine and internet in this period correspondence bound with machine which is represented by internet of things (IOT). In this case the security issue is so exclusive and imperative for human being.

3.2 Business Process Modeling

Business process model represents the value of the project. In this project most important of the part capture image, reorganization communication with the owner awareness and also some other feature. In business process model management and system engineering is more activity of represent process of an enterprise so this process is may be analyzed, improved and automated which is shown in figure 3.1. Now we always want every system will be automated so it is more value able for us.

I developed a smart security system which is only for detect a person face who will enter user room. So this system and project is not essential for build a business process model. Therefore we not designee the business process model diagram.
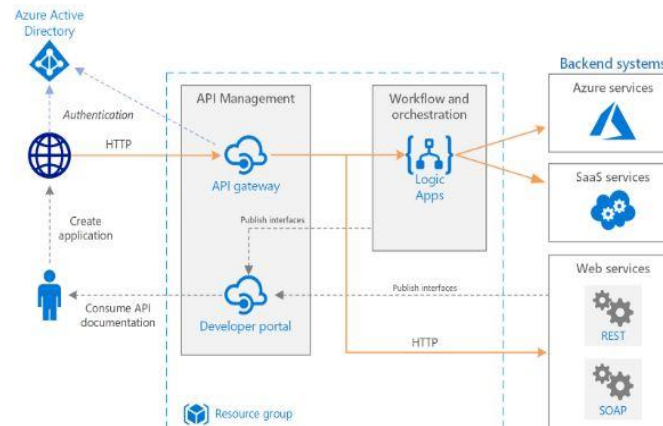
Figure 3.1: Business Process Model

3.3 Requirement collection and analysis

ARDUINO UNO:

Arduino is a microcontroller board based on ATmega 328p. it has 14 output and input and output pin also a USB connection a power jack, an ICSP header and a reset button. It contain a everything needed to support the micro controller..it compute with a USB cable or power it with an AC-to-DC adapter or battery to get started.

SOME TECHNICAL INFORMATION OF ARDUINO UNO:

1. Microcontroller-Atmega328p

2. OperatingVoltage-5v

3. Input Voltage (recommended)-7-12

4. Input Voltage (limits)-6-20v

5. Digital/Opins-14

6. Analog Inputspins-6

7. DC Current per I/Opins-40mA

8. DC current for 3.3vpin-50mA

9. Flash memory-32kb of which 0.5 kb used by boatload

10. SRAP-2kb

11. EEPROM-1kb

12. Clockspeed-16Mhz
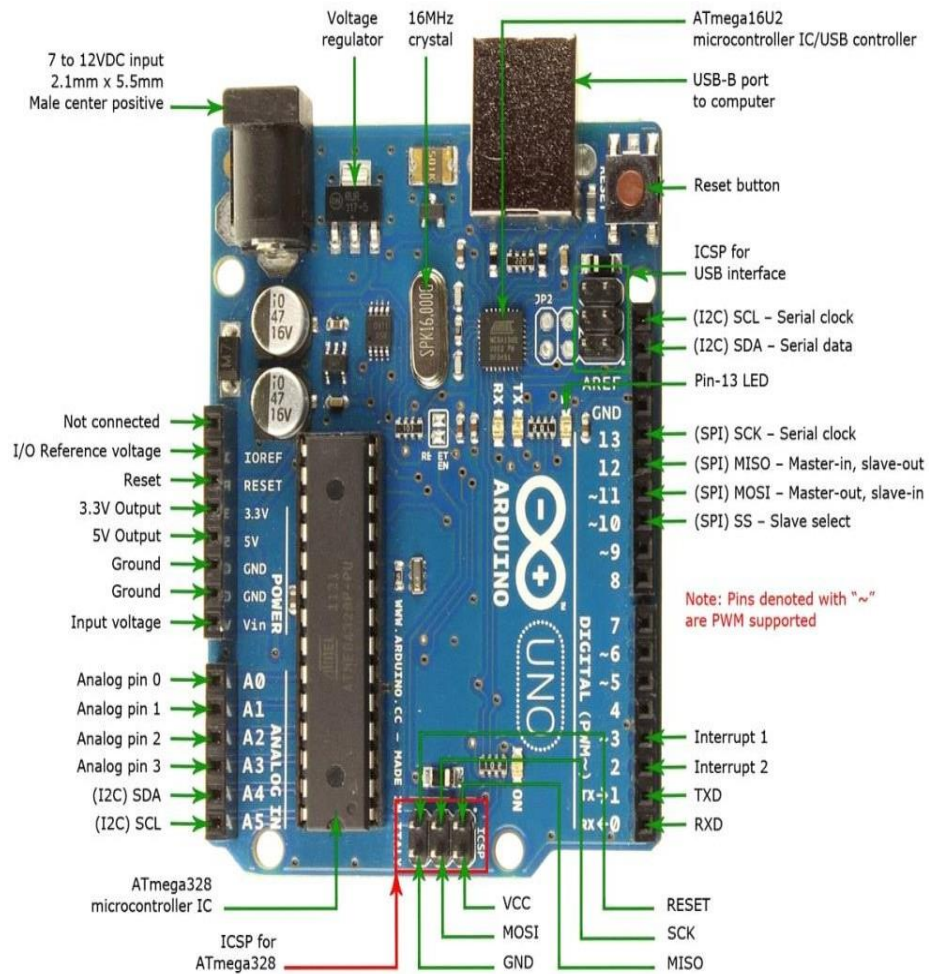
3.4 pin configuration

Figure 3.2: Atmega 328p

3.5 Web cam

Web cam mainly used for taking image capture for face reorganization. It is a instrument which is used for video streaming and real time image capture time to through computer and computer network. When "captured" by the computer, the video stream may be saved, viewed or sent on to other networks travelling through systems such as the internet, and e-mailed as an attachment. When sent to a remote location, the video stream may be saved, viewed or on sent there. Unlike an IP camera (which connects using Ethernet or wifi), a webcam is generally connected by a USB cable, or similar cable, or built into the computer. This is shown in figure 3.3

figure 3.3: web cam

3.6 PC

It is a machine which is connected to the network. It is mainly used for run software. It is typically developed and distributed independency from hardware or operating system.

3.7 Analysis

The most important and initial part is security. For security issue the institute wants secure that. The most important issue public or private institutions various security systems have been proposed and developed for some process as person identification, verification. For research we want to need more numerous applications for face reorganization. So most important part is security system development. With the potential application for door access control this system must be focuses on the study an development face recognition system. Face recognition system developed purposely built for door access control. So we have to need to update the security system .We build a simple and user friendly app for an admin and also for user. Our main focuses to feel them good. This is important that everybody can find what they are looking for in this app easily and for the admin it should be very simple to understand the scenario.

3.8 METHODOLOGY

The Home Security system composes of two different sensors which can monitor the home conditions. The sensors used in this paper are Passive Infrared sensor and Infrared sensor. Next, the Espresso Lite V2.0 is used to connect all the sensors together and act as the main controller. The Blink application is used as a switch to turn ON and OFF the device. The FAVORIOT platform is used to receive the data send from the Espresso Lite V2.0. In the figure 3.4 it will be shown in
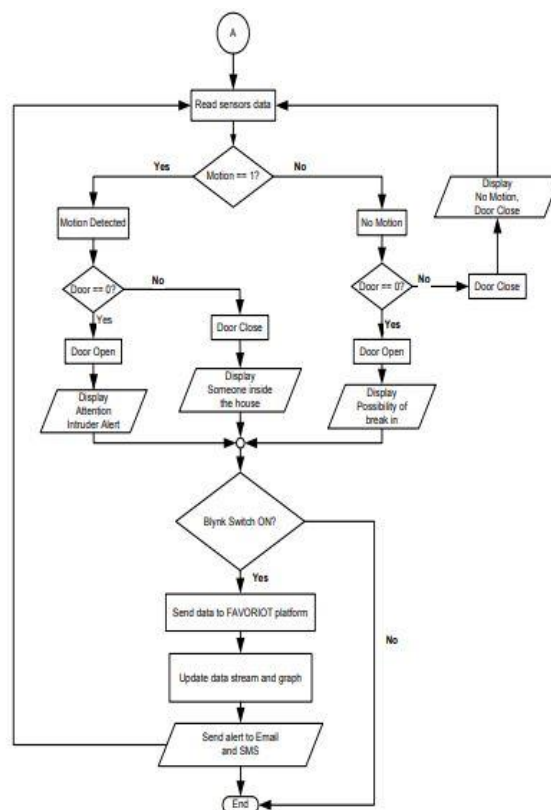

Figure 3.4: flow chart

3.9 Use Case Modeling and Description

In this figure 3.5 we can see that is a use case model for IOT based smart security system for owner. Using this model the owner can easily access the system and control it also identify the face. When the camera take a image then it will stored in the data then the system started to matching data. If the data will match then it will easily open if the data will not match the system will not open. In this time the owner can open the system by using pass code, now the use case diagram given below:
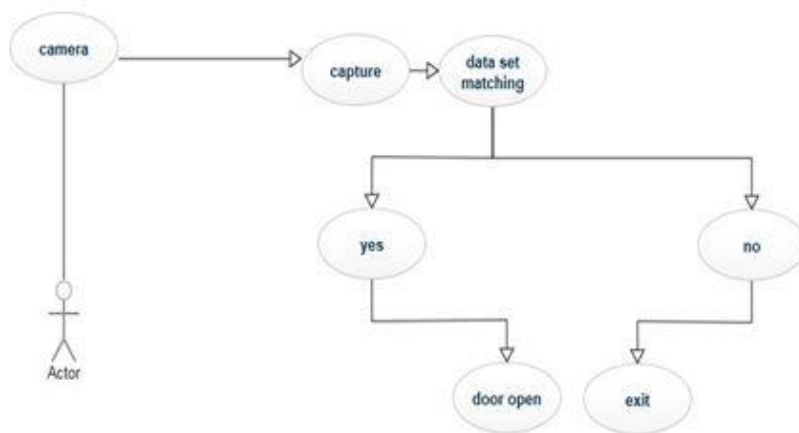

Figure 3.5: Use case model

3.10 DESIGN REQUIREMENT:

For software design:

1.Python

For Hardware design:

1. Web cam

2. Arduino uno

3. Board

3.11 Logical Data Model

The most important and initial part is security. For security issue the institute wants secure that. The most important issue public or private institutions various security systems have been proposed and developed for some process as person identification, verification. For research we want to need more numerous applications for face reorganization. So most important part is security system development. With the potential application for door access control this system must be focuses on the study and development face recognition system. Face recognition system developed purposely built for door access control. So we have to need to update the security system .We build a simple and user friendly app for an admin and also for user. Our main focuses to feel them good. This is important that everybody can find what they are looking for in this app easily and for the admin it should be very simple to understand the scenario.
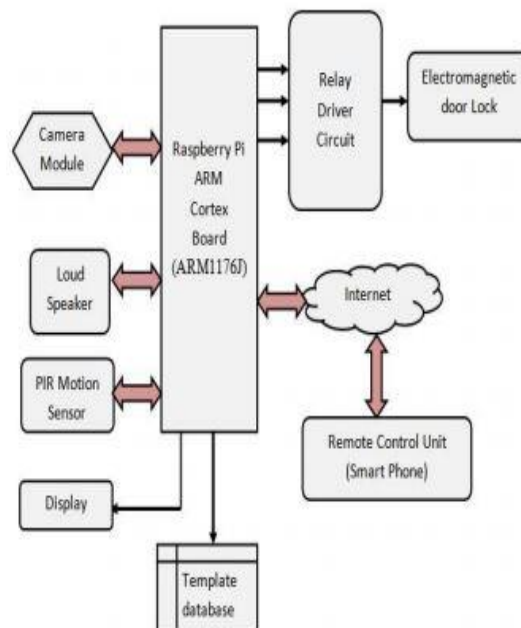

Figure 3.6: Logical Data Model (E-R Diagram)

CHAPTER 4
DESIGN SPECIFICATION

4.1 Introduction

Smart security system is a most important in our daily life. This system is an option such as a security system. This system is automated system. Now our world is mostly converted to automated system that system makes our life easier. To open the door we have no need to control the door. It's automatically open & close. In this system it first check human face then it is check the data which is stored in memory if it will match the face it will open the door if it cannot detect face or mismatch its face it will not open the door also give a signal to the owner of the properties.

4.2 Front-End Design

Front and end state is the user interface design. This document is prepared by the client is a design specification which is details so the requirement of the project. When designing your security system, at a minimum, I always recommend protecting all of your doors and using a motion detector to be used as a backup if entry is gained through a window. A minimum of one smoke detector will ensure that, in the event of a fire, a signal is sent if there is no time, or you are unable to contact the fire department. Each of the above considerations will be dealt with in greater detail in the blog-or you can get additional information and guidance

4.3 IMPLEMENT REQUIREMENT

Security is becoming a major issue everywhere. Home Security is becoming necessary nowadays as the possibilities of intrusion are increasing day by day. Safety from theft, leaking of raw gas and fire are the necessary requirements for home security system. However, the GSM (global system for mobile communication) based security systems provides enhanced security as whenever a signal from sensor occurs, a text message is sent to the desired number to take necessary actions. Here we are using an antitheft reporting system which will report the owner by ringing alarm and send a text message For this project we used various

kind of hardware and software for the project. For this project we use various platforms for implement the project. We will describe this platform now given below:

4.4 RESOURCE REQUIREMENTS

Resources are including various hardware and software are required for this project. The requirements are now given here:

4.5 Software requirements:
1. Python
2. Open CV
3. Numpy
4. Pillow Library
5. Arduino UNO

4.6 SYSTEM REQUIREMENTS:
1. Microsoft Windows 7/8/8.1/10
2. GB RAM or Higher
3. GB available disk space

4.7 PYTHON:
Python is a object oriented higher level programming language. Which is a integrated dynamic semantics primarily for web and app development. It is a most attractive language for any field of repair application development. It offers dynamic binding option. It is a most valuable object oriented language. Any kind of development or app we can easily used the   python.

Security in python: white-box analysis, structural and functional analysis

Security of python: black-box analysis, identify and address security-related issues

Security with python: develop security hardened python suitable for high-risk and high-security environments.

4.8 OPEN CV:

Open CV is released under a BSD license and hence. This is free and commercial use. It has C++, python, java interface and supported windows, Linux, Mac, or IOS and android. Enable open CV we can take advantage of the hardware acceleration of computer platform. Open CV is easy for business utilized and modified code.

4.9 NUMPY:

Numpy is a library function of python. It is a compiler of python. It contains much kind of things. NumPy is a module for Python. The name is an acronym for "Numeric Python" or "Numerical Python". It is pronounced (NUM-py) or less often (NUM-pee)). It is an extension module for Python, mostly written in C. This makes sure that the precompiled mathematical and numerical functions and functionalities of Numpy guarantee great execution speed.

1. A powerful dimension of array object.

2. Broadcasting Function

3. Tools for C/C++ and Fortran code

4. It is most useful linear algebra, Fortran, random number capabilities

4.10 ARDUINO UNO:

Arduino is a microcontroller board based on AT mega 328p. it has 14 output and input and output pin also a USB connection a power jack, an ICSP header and a reset button. It contain a everything needed to support the micro controller. It computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. It is a open source electronics platform based on easy to use hardware and software.

4.11 PILLOW:

Python Imaging Library y (abbreviated as PIL)(in new reversion known as Pillow)is a free library for the Python programming language that adds support for opening

Manipulating, and saving many different image file formats. It is available for Windows, Mac OS X and Linux.

CHAPTER 5
IMPLEMENTATION AND TESTING

5.1 Introduction

This chapter summarizes the features and evaluation of the software that is an overall success in the project specification. System limitation will be talked about to show what more functions could be added and which part of the application can be optimized. Finally, future work will be discussed on the possible extension of the project if further development needs to be done.

5.2 Implementation of Database

When someone come in front of the camera the camera will take the image and detect the user face if the face is matched the door will be automatically open. If the face is not match it stored the data and send to the owner if owner give permission then the door will be open and save data on its database. In implementation interaction is a piece of our system.

5.3 Testing implementation:

This project work proposes an idea of for face reorganization concept for accessing the door lock system and it implemented with the help of OpenCV [7] which is a popular computer vision library. Face recognition is an important application of image processing owing to its use in many fields. An effective face recognition system based on OpenCV is developed in the project. Face recognition has been a best choice after problem of biometrics and it has a various type of applications in our present life. An efficient face recognition system can be of great help in for ensicsciences, identification for law enforcement, authentication for banking and security system, and giving preferential access to authorized users i.e. access control for secured areas etc. The features we will add for the security system which is implemented those and acts that implementation operation are the testing of implemented features. At first when we it about the project we firstly install python then we install the open cv. After complete two installations then we work about face detection. After testing and completing all of things we implemented these features and take into our final project smart security system. We will control the system with these features.

5.4 Test Result and Report:

In this project first of all we work with face detection for matching with the data set. In this we have first need to build up a relation with data and object.

After complete the matching data set then we go to next step to take general purpose input and output signals. And pulse width modulation output to a servo motor rotates with a ninety degree angle. When the motor will rotate with ninety degree angle the lock will be unlocked. If the face will not match at that time the servo motor does not work in that time. This is shown in figure 5.1
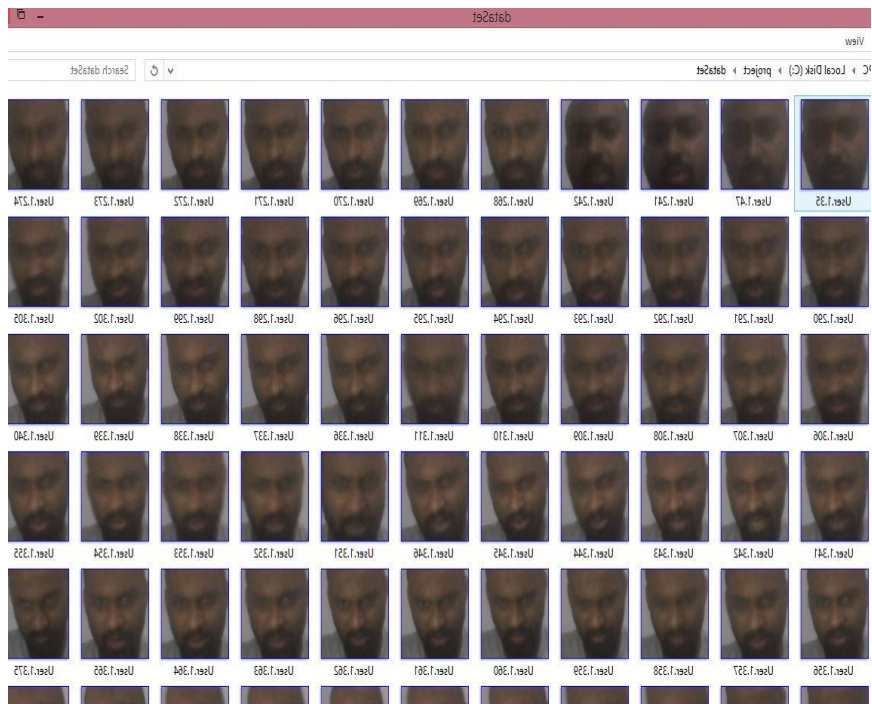

Figure 5.1: user view

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion and Conclusion:

In this paper we mainly work in face detection for automatic lock and unlock system. This process is fully different from others. In this system we can easily automatic face detection and identification with python program on pc.

Face detection is increased day by day. Using face detection we can prevention a person, identification, protect crime and find out criminal. Using face detection we have more scope to use it. Using that the security system automatic lock or unlock. The owner can only read and write that. Any country of the world can make the security system follow the system. Our challenge is to increase the accuracy of the system and covert to it web and android base. Because if we made it web or android base it will be more comfortable to the user.

6.2 Scope for Further Development

In future we want to make it more friendly and comfortable for user. We could have do some work so we need to continue with it:

1. More data analysis
2. Convert to the android platform
3. Increased accuracy of the system

Project Reflection:

This we will describe the whole project reflection. We are getting a little time for working that. But it is a unique project. We think a lot of this project is thinking and need more time to grow up the project. For this project we face more problems to collect the data set. If we collect more data we will improve the project more and more. Face detection is increased day by day. Using face detection we can prevention a person, identification, protect crime and find out criminal. Using face detection we have more scope to use it. Using that the security system automatic lock or unlock. The owner can only read and write that. Any country of the world can make the security system follow the system. This is shown in figure 6.1, 6.2 & 6.3
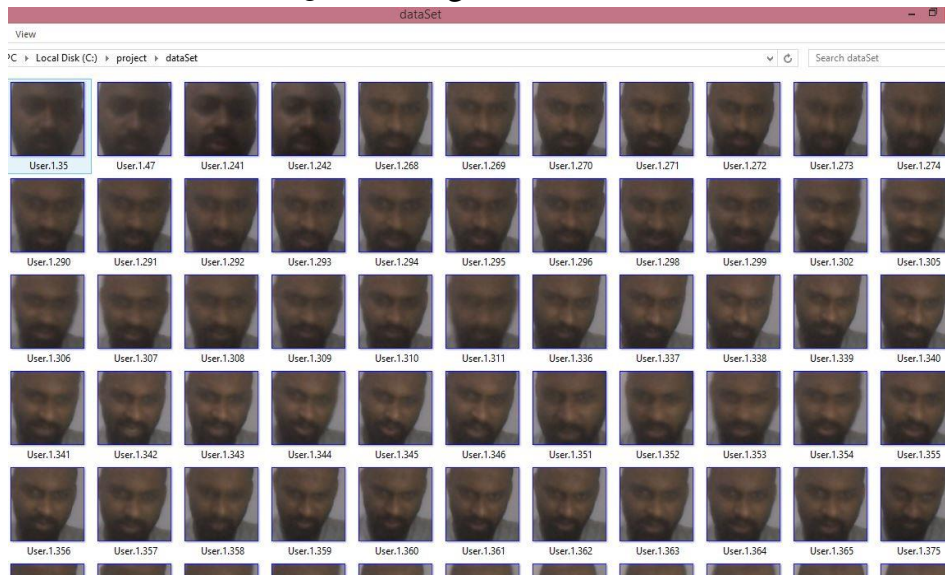
Figure 6.1: figure of data

Figure 6.2: data set

On the software part python and open cv library is installed to train faces. To the train faces first include in the library .then the training data should be loaded into the memory which is captured in chapter six. In this system it will take more image continuously different angle and stored the data. we given the data set name is "abcd.yml" .this files contains positive data for processed into it. The data will make smaller it will take average 10 minutes to picture to the process.
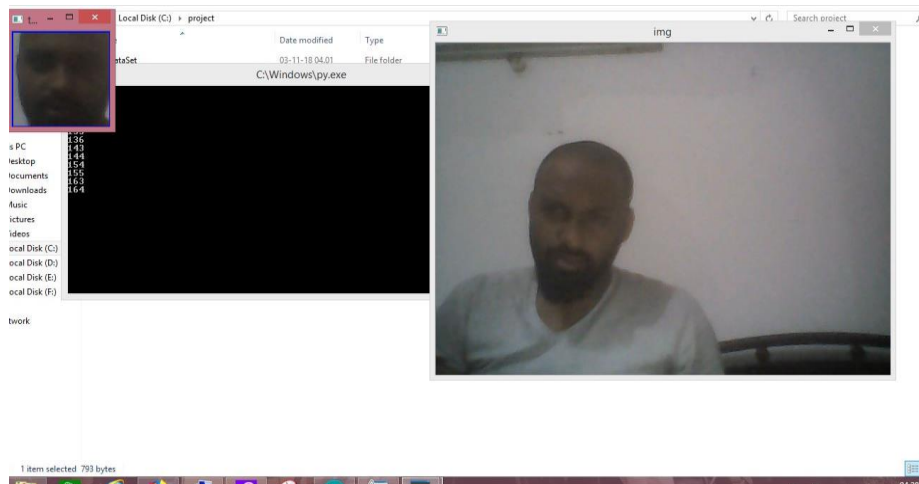
Figure 6.3: face detection

6.4 Block Diagram:

In the diagram the system input the image then it wills pre processing the image for future extraction. . Then it classifier the image then the data will mark as known and unknown. Then the known data are saved in the database. When any person will come then the camera take capture of image and compare with the database. This is shown in 6.4
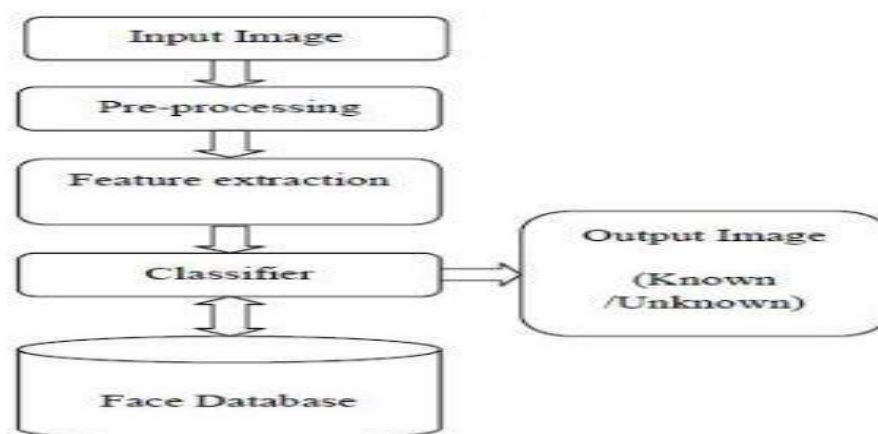

Figure 6.4: Block Diagram

REFERENCES:

1.   https://components101.com/microcontrollers/arduino-uno [For arduino]

2.   https://www.python.org/about/gettingstarted/ [For python]

3.   http://www.numpy.org/ [For numpy]

4.   https://creately.com/diagram-type/use-case[for creating use case model]

5.   https://opencv.org/[for open cv]

6.   https://en.wikipedia.org/wiki/Face_detection [for face detection]

7.   https://docs.python-guide.org/scenarios/imaging/[for python image processing]

8.   https://opencv-python-tutroals.readthedocs.io/en/latest/py_tutorials/py_imgproc/py_table_of_contents_imgproc/py_table_of_contents_imgproc.html [for python and open cv]

Appendix A:

But it is a unique project. We think a lot of this project is thinking and need more time to grow up the project. For this project we face more problems to collect the data set. If we collect more data we will improve the project more and more. Face detection is increased day by day. Using face detection we can prevention a person, identification, protect crime and find out criminal. Using face detection we have more scope to use it. Using that the security system automatic lock or unlock. The owner can only read and write that. Any country of the world can make the security system follow the system.

Appendix B:

We will face some project when we work that project. in this time when the image capture by camera it will needs more light for better performance. But it is a unique project. We think a lot of this project is thinking and need more time to grow up the project. For this project we face more problems to collect the data set. If we collect more data we will improve the project more and more