SECURITY CAMERA

Submitted in partial fulfillment ofthe
requirements of the degree **BACHELOR
OF ENGINEERING** IN
COMPUTER ENGINEERING
By

**SAHIL GAIKWAD 221041016/16 ATHARVA
HARANE 221041026/19 ROHAN JARKAL
221041060/23 ANIKET CHAVAN
221041007/08**

Prof. S. A. AWATE

Department of Computer Engineering

A. C. Patil College of Engineering

**Kharghar, Navi Mumbai University of
Mumbai (AY 2023-24)**

CERTIFICATE

This is to certify that the java Mini Project entitled **"Security camera using python"** is a bonafide work of ATHARVA 19, SAHIL 16, ANIKET 08, ROHAN 23 submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of **"Bachelor of Engineering"** in**"Computer Engineering"**

(Prof. S. A. AWATE)

Supervisor

(Dr. M. M. Deshpande)   **(Dr. V. N. Pawar)**

Head of Department   Principal

Mini Project Approval

This Mini Project entitled SECURITY CAMERA USING PYTHON by ATHARVA 19,SAHIL 16, ANIKET 08, ROHAN 23 is approved for the degree of **Bachelor of Engineering** in **Computer Engineering.**

Examiners

1..…………………………………

(Internal Examiner Name & Sign)

2.……………………………………

(External Examiner name & Sign)

Date:

Place:

Content

1. **Acknowledgments**
2. **List of Abbreviations**
3. **List of Figures**
4. **List of Tables**
5. **List of Symbols**

1. Introduction
1. Introduction
2. Motivation
3. Problem Statement & Objectives
4. Organization of the Report

2. Literature Survey
1. Survey of Existing System
2. Limitation Existing system or research gap
3. Mini Project Contribution

3. Proposed System (eg New Approach of Data Summarization)
1. Introduction 2. Architecture/Framework
3. Algorithm and /or Process Design
4. Details of Hardware & Software
5. Experiment and Results
6. Conclusion and Future work.

ACKNOWLEDGEMENTS

1. **Project Team:**

    Begin by acknowledging the members of your project team who contributed to the project's success. This may include engineers, designers, technicians, and support staff.

2. **Supervisors and Mentors:**

    Show appreciation for the guidance and support provided by project supervisors, mentors, or advisors who helped steer the project in the right direction.

INTRODUCTION

1.Project Overview:
- The security camera project aims to

  Enhance safety and surveillance in various settings.
- It involves the deployment of cameras
  equipped with advanced features to monitor and record activities.

2.Importance of Security:
- Security is a paramount concern in today's world due to

  increasing crime rates and safety challenges.
- Surveillance cameras play a pivotal role in deterring and
  documenting incidents.

3.Objectives:
- To design and implement a reliable security camera system.
- To provide real-time monitoring capabilities.
- To record and store footage for investigative and evidentiary purposes.

4.Camera Selection:
- The project involves selecting suitable camera types

  (e.g., IP cameras, PTZ cameras)

  based on the specific surveillance needs.
- Consider factors like resolution, field of view, and night vision
  capabilities.

MOTIVATION

A security camera project aims to enhance safety and surveillance by monitoring and recording activities in a specific area, deter potential threats, and provide valuable evidence in case of incidents.

Problem statement

Develop a cost-effective, reliable, and scalable security camera system to enhance the safety and surveillance of a residential or commercial property.

Objective

1. Design and implement a security camera using laptop camera.

2. Ensure real-time alerts for all activities and movements.

3. Provide buzzer system when movement is detected.

4. Motion detection for security.

5. Provide user friendly program for security purpose.

6. Provide green colored rectangular block for motion detection.

SOLUTION FOR PROBLEM
DEFINITION

1. Camera Selection:

Using laptop camera detect the motion by any living and
non living things

2. Motion Detection:

Implement motion detection algorithms to trigger recording and alerts
when unusual activity is detected, reducing storage requirements and false
alarms.

3. Alert System:

Provide the green colored rectangular block to detect the motion and then
provide the buzzer for security purpose.

ORGANIZATION Of THE REPORT

LITERATURE SURVEY

1. **Surveillance Camera :**

Research on the security camera system for detection and motion alert.

2. **Sound Alert :**

Provide the sound alert for motion detection and the rectangular block is used for that motion detection.

LIMITATION OF
EXISTING SYSTEM

1. **Limited Field of View:**

    Cameras have a fixed field of view, leaving blind spots.

2. **Poor Low-Light Performance:**

    Many struggle in low-light conditions.

3. **Limited Resolution:**

    Lower-res cameras may not capture fine details.

4. **Bandwidth Constraints:**

    High-quality footage demands significant bandwidth.

5. **Lack of AI Integration:**

    Many systems lack advanced AI for object recognition.

6. **Vulnerability to Hacking:**

    Weak security can make them susceptible to breaches.

7. Storage Challenges:

Large volumes of video data need extensive storage.

8. Costly Installation:

Professional setup can be expensive.

9. Privacy Concerns:

Cameras can infringe on privacy if not managed properly.

MINI PROJECT CONTRIBUTION

Creating a security camera system to detect movement is an ambitious project that can contribute significantly to enhancing security and surveillance. Here's a suggested project outline for your group of four members:

Project Title: Security Camera

Project Description: Develop a security camera system that employs advanced computer vision and machine learning techniques to detect and respond to movement, enhancing security and surveillance. The project can be broken down into several components, with each team member responsible for specific tasks:

1.Program Setup In Laptop (ATHARVA):
Select and set up the camera software.
Ensure that the camera has the clearance and detect properly.

2. Software Development (ATHARVA and SAHIL):
Develop the software to capture video feed from the camera.
Implement image processing algorithms to analyze video frames for movement detection.
Integrate computer vision libraries like OpenCV for more advanced image analysis.

1. Motion Detection Algorithm (ROHAN):
- Design and implement a motion detection algorithm using background subtraction, frame differencing, or more advanced methods.
- Set up a sensitivity threshold for motion detection.
- Test and fine-tune the algorithm for accuracy.

or recorded video streams.

- Implement cloud storage for storing recorded videos and images.

2. **Testing** (SAHIL):

- Perform thorough testing and validation to ensure reliable motion detection and timely alerts.
- Conduct stress testing to assess the system's performance in different scenarios.

PROPOSED SYSTEM

INTRODUCTION

Objective:

-Enhance security and surveillance in Banksand Musium

- Deter potential intruders and ensure the safetyof residents/employees.

System Components:

- High-definition security cameras.
  - Network video recorder (NVR) for datastorage.

- Motion sensors and alarms.
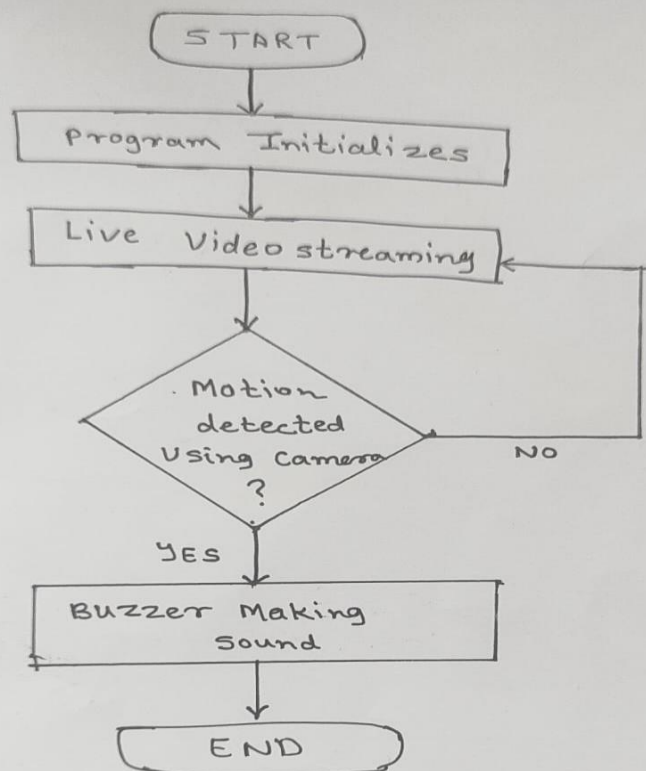
Benefits:

- Improved safety and crime prevention.

- Evidence collection for investigations.

Conclusion:

    - The proposed security camera system will significantly enhance security and provide peace of mind to residents in banks

ALGORITHM AND PROCESS DESIGN

Algorithm DIAGRAM:

SEQUENCE DIAGRAM

A sequence diagram in Unified Modeling Language (UML) is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagrams.

DETAILS OFHARDWARE AND SOFTWARE

SOFTWARE REQUIREMENTS

1. **Python**
2. **OpenCV**
3. **Motion Detection Algorithm**

HARDWARE REQUIREMENTS

System:AMD,INTEL
Harddisk:5gb(min)
RAM: 2GB
Processor:AMD RYZEN/INTEL COREI3
Memory :1GB

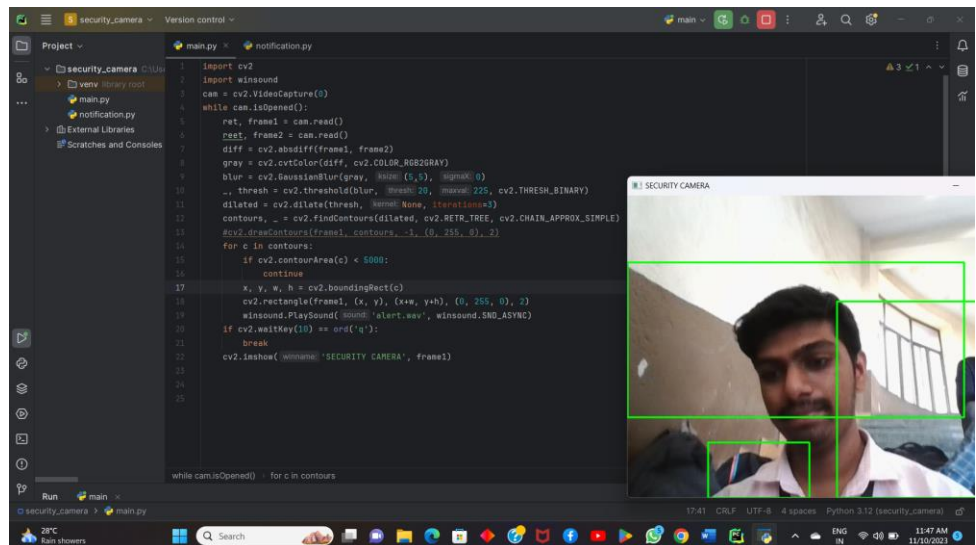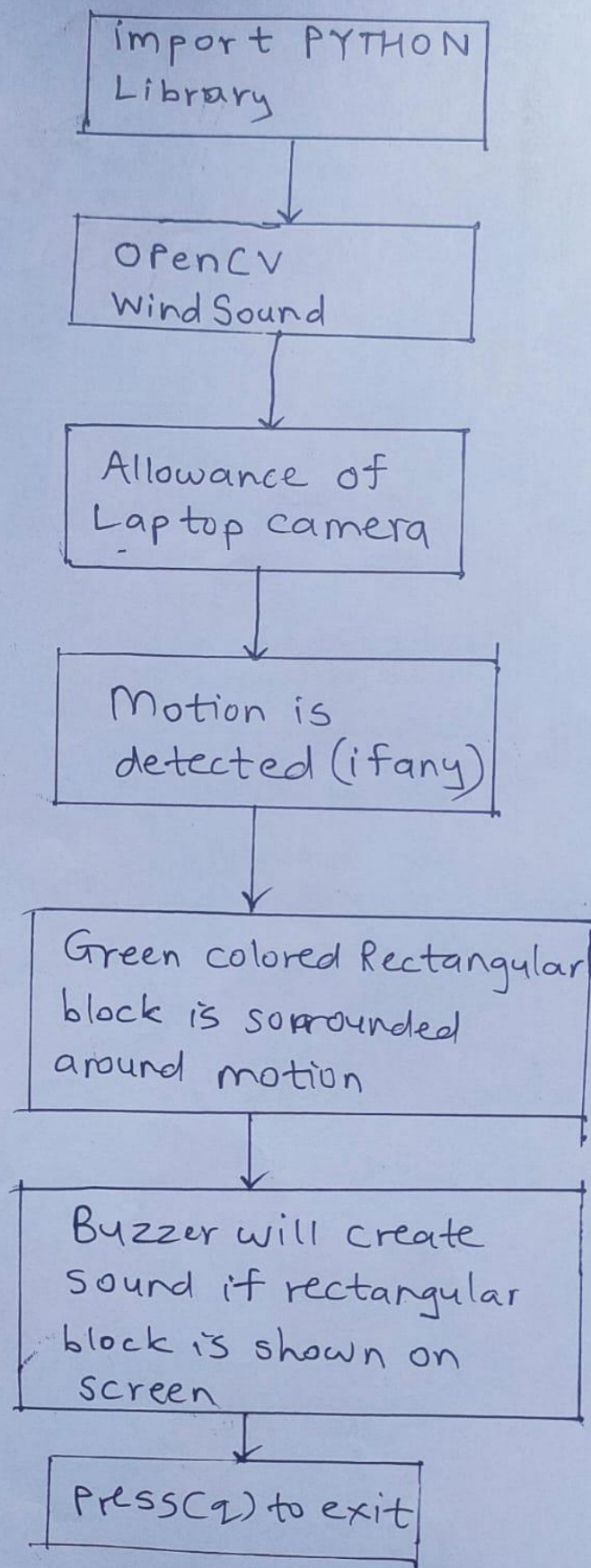# EXPERIMENTS AND RESULTS

1.   Camera Input:

Interface with a camera (e.g., USB webcam or IP camera) to capture video feed.

2.   Video Processing:

Use Python libraries like OpenCV for video analysis, which can include:

- Motion detection to identify changes in the frame.

- Object recognition for specific objects or people.

```
┌─────────────────────┐
│ import PYTHON       │
│ Library             │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│ OpenCV              │
│ Wind Sound          │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│ Allowance of        │
│ Laptop camera       │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│ Motion is           │
│ detected (if any)   │
└─────────────────────┘
           │
           ▼
┌─────────────────────────────┐
│ Green colored Rectangular   │
│ block is sorrounded         │
│ around motion               │
└─────────────────────────────┘
           │
           ▼
┌─────────────────────────────┐
│ Buzzer will create          │
│ sound if rectangular        │
│ block is shown on           │
│ screen                      │
└─────────────────────────────┘
           │
           ▼
┌─────────────────────┐
│ Press(q) to exit    │
└─────────────────────┘
```

CONCLUSION

In conclusion, the security camera project implemented using Python provides and effective and cost-efficient solution for monitoring and enhancing security. It offers features like motion detection and video recording, making it a valuable tool for safeguarding homes and businesses. With its flexibility and accessibility, this project showcases the power of Python for DIY security systems.

REFERENCES

1. *OpenCV (Official Website):https://opencv.org/*

2. *PyImage Search (Tutorials and*

Resources):

https://www.pyimagesearch.com/

3. *GitHub (Search for open-source security camera*

projects): https://github.com/

These resources can help you get started with your security camera project using Python.