**VIDEO CAPTURING USING RASPBERRY PI AND STORING IT IN CLOUD**

MINI PROJECT

REPORT

SUBMITTED TO

M S RAMAIAH INSTITUTE OF TECHNOLOGY

(Autonomous Institute, Affiliated to VTU)

**SUBMITTED BY**

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As part of the Course

**Real time Application Development using Python Programming Laboratory MCSL18**

SUPERVISED BY

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

M S RAMAIAH INSTITUTE OF TECHNOLOGY

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**CERTIFICATE**

This is to certify that **Sanjith V (1MS23SCS22)** have completed the **“Video capturing using raspberry pi and storing it in cloud”** as part of **Real time Application Development using Python Programming Laboratory** course. I declare that the entire content embodied in this M.Tech CSE semester report contents are not copied.

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**Evaluation Sheet**

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| **USN** | **Name** | **Literature study & Implementation**  **(10)** | **Documentation & Plagiarism checkup (10)** | **Total Marks**  **(20)** |
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**Problem Definition**

Develop a system for video surveillance using raspberry pi circuit and through raspberry pi camera and periodically uploading it in cloud. The cloud storage uesd for storing is Google firebase which provides realtime storage facility that can be connected through its pyrebase api with proper credentials.

**Literature Study**

Himani Shah, Nishchay Parikh, Yashvi Bhavsar, Himani Desai - "REAL-TIME VIDEO SURVEILLANCE USING RASPBERRY PI" - International Research Journal of Engineering and Technology (IRJET): Volume-09, Issue-12, December 2022, e-ISSN: 2395-0056, p-ISSN: 2395-0072

This paper portrays the surveillance system which comprises a Raspberry Pi 4 circuit board and Pi camera to monitor as well as stream the feed live in real-time.

The proposed system focused on home surveillance. It presents a real time video surveillance system

wherein live streams and records of the video footage are provided to the concerned user whenever an unexpected motion is detected in the house. The implementation of so is done using OpenCV for coding, Raspberry Pi 4, and Raspberry Pi camera for motion detection. The operating system used for this project is Raspberry Pi OS. It sends an alert along with the image the camera captured when motion was detected.

**Implementation**

The System aims to record the video of the setup scenary and storing it in cloud. The system records video clips using pi camera of raspberry pi, through raspberry pi circuit board. It makes use of Google firebase cloud storage service for storing recordings. Programming of this task is done through python programming language and google firebase api.

First raspberry pi operating system, a port of debian bookworm, linux based OS is installed on 32 GB SD card. Later all the software and firmware are updated to make sure all the latest features are supported and for security and performance. 8 mp Raspberry pi camera is connected through cable to raspberry board for interfacing/connection and this connection details are updated in raspberry pi configuration file. Connected pi camera is tested prior to make sure it is working properly and able to capture images and videos.

Google firebase account is created and real time storage is setup for storage purpose. The credentials, project details, storage details of this creation are used for setting up cloud storage for storing videos recorded. pyrebase python module is installed using pip (python package manger), which is a python module that provides api features for the firebase connection. It is imported and configured with necessary details and storage setup is done. Python program is written to start recording and store it in cloud with the time of creation as the name of the file stored.

**Technical Components:**

1. Operating System: Raspberry Pi OS
2. Programming Language: Python v3
3. Libraries: pyrebase
4. Storage: Google firebase

**Code:**

**Python file: code.py**

import pyrebase

from picamera import PiCamera

from datetime import datetime

from time import sleep

firebaseConfig = {

"apiKey": "AIzaSyAHz3uxdA16oFtBFsxau0hHFkoD2XRr2VA",

"authDomain": "python-raspberry-pi-proj-2b608.firebaseapp.com",

"databaseURL": "https://python-raspberry-pi-proj-2b608-default-rtdb.asia-southeast1.firebasedatabase.app",

"projectId": "python-raspberry-pi-proj-2b608",

"storageBucket": "python-raspberry-pi-proj-2b608.appspot.com",

"messagingSenderId": "312393792580",

"appId": "1:312393792580:web:291111ef703f5fa3e85011",

"measurementId": "G-E0D5BCEVQE"

}

firebase = pyrebase.initialize\_app(firebaseConfig)

storage = firebase.storage()

camera = PiCamera()

now = datetime.now()

timestamp = now.strftime("%d-%m-%Y %H:%M:%S")

name = timestamp

file = name + ".h264"

try:

print("Recording started..")

camera.annotate\_text = timestamp

camera.start\_recording(f'/home/rasp/pythonproject/{file}')

sleep(10)

camera.stop\_recording()

print("Record ended..")

print("Video with filename " + "\"" + file + "\"" + " has been saved..")

print("File is being uploaded to cloud.. Please wait..")

storage.child(f'{file}').put(f'{file}')

print("File uploaded to cloud successfully..")

#os.remove(file)

#print("File removed from local storage..")

sleep(2)

camera.close()

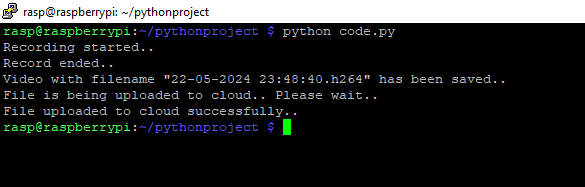
except Exception as err:

print(err)

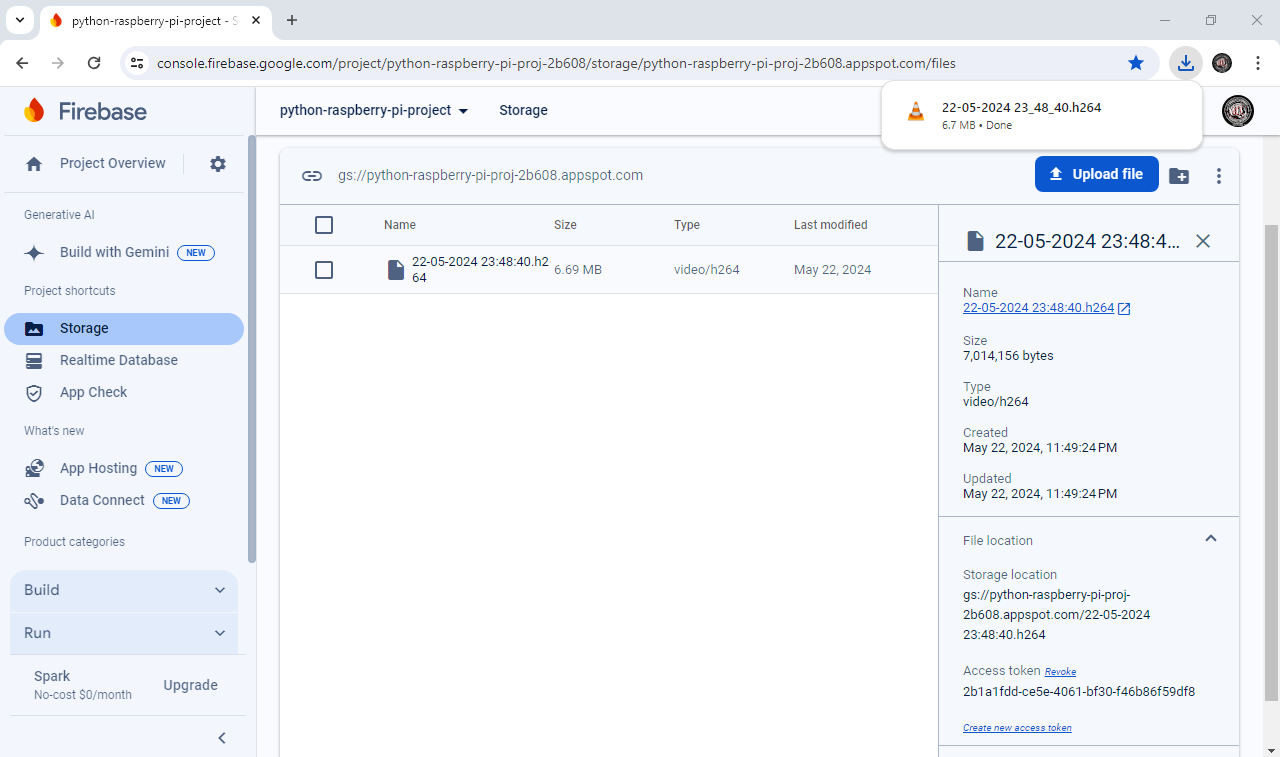
camera.close()

exit()

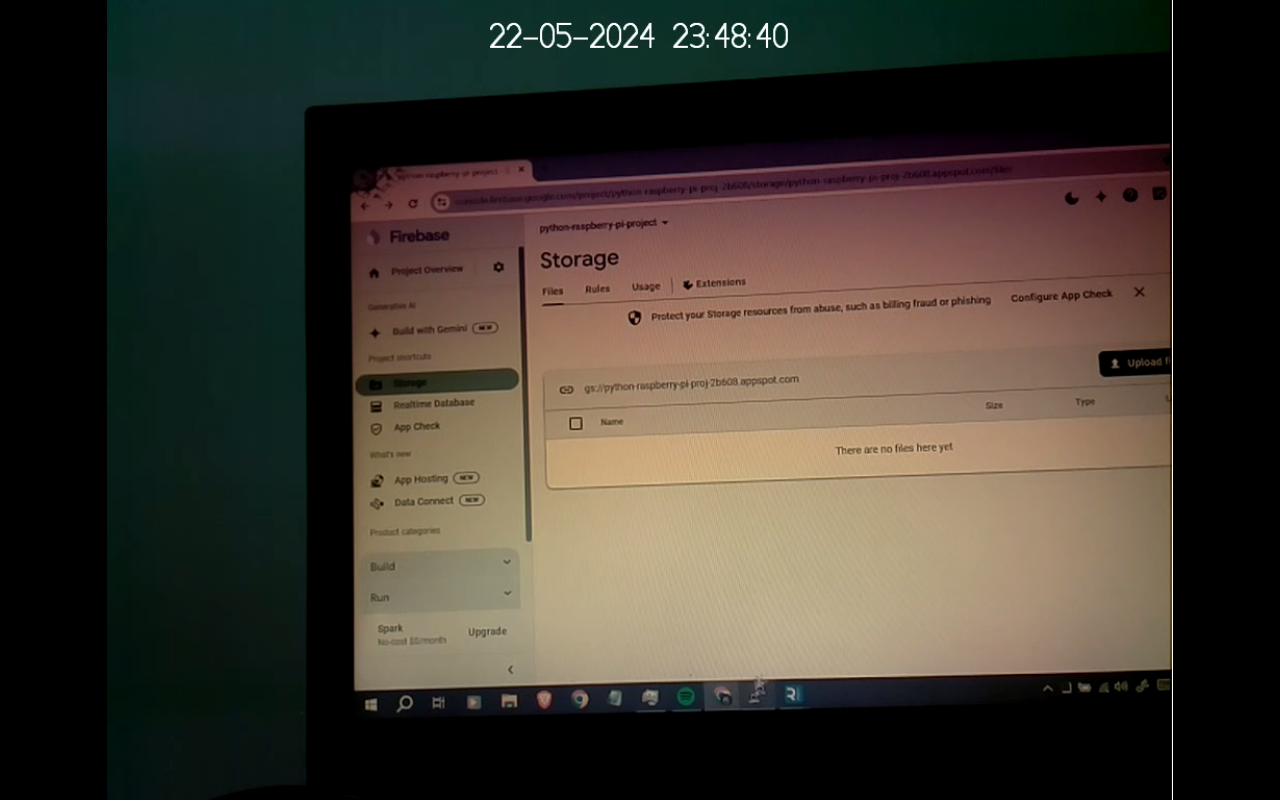
**Results**



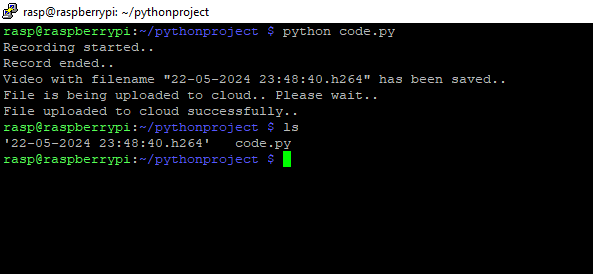
This screenshot is from the raspberry pi os terminal, showing the execution of program to record and store the recorded video in cloud.



This is the google firebase storage web page, showing the recorded file from raspberry pi.



This is a snapshot of the recorded video file accessed from firebase cloud.



This is the screenshot showing the creation of the recorder file on the local raspberry pi system storage.

**Conclusion**

This project is real time application of raspberry pi, which is a cheap computer that runs on linux. The Raspberry Pi Zero 2 was used for this project. It is a fast and versatile device. We get results quickly and precisely. The Raspberry OS and code were stored on a 32 GB memory card. The raspberry camera has an 8MP resolution, which provides the user with a very clear image. Python programming language was used to program the system. Google firebase cloud account was created for storage purpose. Using firebase api and python "pyrebase" module, configuration and setup for storage facility through the created account's credentials was made. Program can be run to capture video and store in cloud. This project is for home surveillance security systems.

**References**

1. Himani Shah, Nishchay Parikh, Yashvi Bhavsar, Himani Desai - "REAL-TIME VIDEO SURVEILLANCE USING RASPBERRY PI" - International Research Journal of Engineering and Technology (IRJET): Volume-09, Issue-12, December 2022, e-ISSN: 2395-0056, p-ISSN: 2395-0072.