FRAMS- Facial Recognition Attendance System

Submitted By: -
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We have implemented FRAMS project using two ways-

1. Using Microsoft Cognitive Face API (frams)

2. Using Face Landmark Detection Algorithm offered by Dlib (frams2)

(1. Using Microsoft Cognitive Face API)

A prototype that will facilitate classroom control and attendance by face detection and recognition of students faces in a digital image taken by a mobile phone camera.

1. Getting Started

- This Project has been successfully implemented in Linux Environment.
- To run this project Properly Ubuntu 16.04 or above is required.

STEP 1:

Extract 3.zip file and copy the folders into the home directory.

STEP 2:

- To run our project some Libraries are required to be installed.
- To make the process of installation easy we have created a setup folder which contains setup.py, websetup.py and databasesetup.py files which will install all the required libraries.
- To run the setup.py file
  1. Open Terminal
  2. Go to the setup directory.
     Run on Terminal - `$ python3 setup.py`
- The installation will need you to give inputs like your system password and confirmation (YES or NO).

STEP 3:

- After successful completion (without error) execution of setup.py
- Run on Terminal -

```
1. $ mysql -u root
2. mysql> CREATE USER 'user'@'localhost' IDENTIFIED BY 'user123@FRAMS';
3. mysql> GRANT ALL PRIVILEGES ON *.* TO 'user'@'localhost';
4. mysql> UPDATE mysql.user SET Grant_priv='Y', Super_priv='Y' WHERE
User='user';
5. mysql> FLUSH PRIVILEGES;
6. mysql> exit;
7. Run on terminal - $ python3 databasesetup.py
```

STEP 4:

- After successful completion (without error) execution of databasesetup.py
- Steps to host the website in localhost:
  1. Open terminal and Run:
- `$ python3 websetup.py`
  2. Copy the folder framsweb to /var/www/html (COMPUTER drive).

1.1 Camera Input Procedure

- The camera which we have used in our project is from a mobile device. (In order to get better picture and video quality as compared to a webcam.)
- Input from our phone camera is received to the system via a Wi-Fi connection. This Improves the overall practicality in real world scenarios.
- You are required to install Android/IOS Application named – "IP Webcam" (Click on the Image to download from respective App Stores)

- After Installing the app open the app in your phone, scroll down to the last option "Start Server" press it and note down the IPv4 address displayed on your screen.
- Take a note of that IPv4 Address and
  a. In python program add_student.py
     Change Line 10 to:
     url='http://<your_ip_address>:8080/shot.jpg'
  b. In python program AttendanceGUI.py:
     Change line 39 to:
     url='http://<your_ip_address>:8080/shot.jpg'

(Note – Make sure that while running the program your laptop and phone should be connected to same WiFi hotspot OR it is recommended to start WiFi hotspot on your mobile phone and connect your laptop to your mobile hotspot)

2. Running the Program

- The Project Facial Recognition Attendance Management System has been divided into three parts.
  1. Adding a Student.
  2. Marking Attendance.
  3. Web portal.

Part 1: Adding A Student

- This process is only a one-time process which is required to run at the start of an academic year when new faces of a class are required to be added to a class group.
- Steps to Run this Program:

STEP 1:

Open terminal and move into directory frams
Run Command – `$ python3 adduser.py`
Then a Tkinter window will open and
Information of the student is inputted from this window

STEP 2:

After pressing the Submit button a video capture will start which will take 20 images in 20 sec.
(IP Webcam must be running for video input.)

STEP 3:

The program will continue to execute and if there are no errors then,

The program will complete its execution and if terminal shows "status : succeeded" then program is successfully executed.

STEP 4:

Pressing Exit button will close the window

Part 2: Marking Attendance & Generating Report

- This process is the main Attendance System which will be used throughout the year.
- This process contains two parts:
  a. Marking Attendance in Database
  b. Generating Attendance Repots from Databse
- Steps to Run this program:

STEP 1:

Open terminal and Run:

```
$ python3 AttendanceGUI.py
```

STEP 2:

A Tkinter window will appear and will ask the teachers to whether Mark New Attendance or to Generate Previous Attendance Report.

STEP 3:

If Mark Attendance is pressed then
a video source will pop up, now the teacher is required to hit spacebar to capture the image of the class.
After capturing image all the faces of students in that image will be detected and hen will get recognised against prebuilt Students database which was created at the start of the year.
The program will run until the terminal shows
"Recognition Complete
MySQL connection is closed"

STEP 4:

A Spreadsheet Report of attendance can be generated
By pressing the Generate Report Button.
A file named report.xls will be created in the frams directory.

STEP 5:

Pressing Exit button will close the window.

Part 3: Opening the web portal

- The FRAMS web portal can be used by students and teachers for various to view lecture schedule, attendances and reports.
- **STEP 1:**

  Open Firefox web browser and type localhost/framsweb.
- **STEP 2:**

  The admin login username is 'admin' and password is 'admin'.
- **STEP 3:**

  The student login username is the PRN of student.
- **STEP 4:**

  Once logged in successfully, various operations like viewing timetable, viewing attendance, viewing report, assigning subjects can be done.

NOTE: This project is made during a long period of time and during this period a large number of libraries were installed. We tried our best to include all the possible libraries in setup files. If any problem arises in installation or execution, please refer the video for complete project execution through the link below-

https://drive.google.com/open?id=1Rn12DWj1-qbZDkl_XszqE0OGus_LLr30

FRAMS- Facial Recognition Attendance System

(2. Using Face Landmark Detection Algorithm Offered by Dlib)

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A prototype that will facilitate classroom control and attendance by face detection and recognition of students faces in a digital image taken by a mobile phone camera.

1. Getting Started

- This section is same as frams readme file.
- We have assumed that you have completed this section before.

1.2 Camera Input Procedure

- The camera which we have used in our project is from a mobile device. (In order to get better picture and video quality as compared to a webcam.)
- Input from our phone camera is received to the system via a Wi-Fi connection. This Improves the overall practicality in real world scenarios.
- You are required to install Android/IOS Application named – "IP Webcam" (Click on the Image to download from respective App Stores)

- After Installing the app open the app in your phone, scroll down to the last option "Start Server" press it and note down the IPv4 address displayed on your screen.
- Take a note of that IPv4 Address and
  c. In python program add_student.py
     Change Line 10 to:
     url='http://<your_ip_address>:8080/shot.jpg'
  d. In python program AttendanceGUI.py:
     Change line 43 to:
     url='http://<your_ip_address>:8080/shot.jpg'

(Note – Make sure that while running the program your laptop and phone should be connected to same WiFi hotspot

OR it is recommended to start WiFi hotspot on your mobile phone and connect your laptop to your mobile hotspot)

3. Running the Program

- The Project Facial Recognition Attendance Management System has been divided into three parts.
  1. Adding a Student.
  2. Marking Attendance.
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Part 1: Adding A Student

- This process is only a one-time process which is required to run at the start of an academic year when new faces of a class are required to be added to a class group.
- Steps to Run this Program:

STEP 1:

Open terminal and move into directory frams2
Run Command – `$ python3 adduser.py`
Then a Tkinter window will open and
Information of the student is inputted from this window

STEP 2:

After pressing the Submit button a video capture will start which will take 20 images in 20 sec.
(IP Webcam must be running for video input.)

STEP 3:

The program will continue to execute and if there are no errors then,
The program will complete its execution and if terminal shows "`Faces added Successfully...`" then program is successfully executed.

STEP 4:

Pressing Exit button will close the window

Part 2: Marking Attendance & Generating Report

- This process is the main Attendance System which will be used throughout the year.
- This process contains two parts:
  c. Marking Attendance in Database
  d. Generating Attendance Repots from Databse
- Steps to Run this program:

STEP 1:

Open terminal and Run:

```
$ python3 AttendanceGUI.py
```

STEP 2:

A Tkinter window will appear and will ask the teachers to whether Mark New Attendance or to Generate Previous Attendance Report.

STEP 3:

If train system button is pressed, then a new tkinter window opens which shows the dataset images of students that are being trained.

When this tkinter window is closed, the system is trained successfully.

STEP 4:

If Mark Attendance is pressed then
a video source will pop up, now the teacher is required to hit spacebar to capture the image of the class.
After capturing image all the faces of students in that image will be detected and hen will get recognised against prebuilt Students database which was created at the start of the year.
The program will run until the terminal shows
"Recognition Complete
MySQL connection is closed"

STEP 4:

A Spreadsheet Report of attendance can be generated
By pressing the Generate Report Button.
A file named report.xls will be created in the frams2 directory.

STEP 5:

Pressing Exit button will close the window.

Part 3: Opening the web portal

- The FRAMS web portal can be used by students and teachers for various to view lecture schedule, attendances and reports.
- STEP 1:

  Open Firefox web browser and type localhost/framsweb.
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  The admin login username is 'admin' and password is 'admin'.
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