

Improving The Face Recognition
Capabilities Using DenseNet
Architecture For Attendance
Management In Cloud Computing
Environment Configuration Manual

MSc Research Project
Cloud Computing

Rajiv
Student ID: 17165822

School of Computing
National College of Ireland

Supervisor: Aqeel Kazmi

National College of Ireland
MSc Project Submission Sheet
School of Computing



Student Name: Rajiv.....

Student ID: 17165822.....

Programme: Msc Cloud Computing..... **Year:** 2021.....

Module: Msc Research Project.....

Lecturer: Aqeel Kazmi.....

Submission Due Date: 31/01/2022.....

Project Title:

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Improving The Face Recognition Capabilities Using DenseNet Architecture For Attendance Management In Cloud Computing Environment Configuration Manual

Rajiv
Student ID: 17165822

1 Overview

The Research project is about Face Recognition Attendance System using Python Language. The Implementation of three different Deep Neural Network Algorithms and Evaluate their Results. This configuration Manual has guide to execute the program and setup the environment.

2 Minimum Hardware Requirements

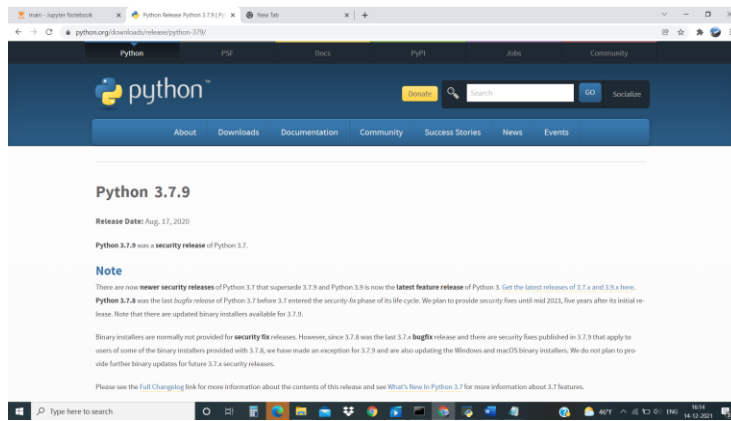
Core I5 2.4 Ghz Processor
Ram 8GB
64 Bit Operating System
Webcam

3 Prerequisite

This section describes about the details to setup environment.

3.1 Python

This project needs to install the Python 3.7.9.



Check the version after installation
Python -V

4 Library Installation

4.1 Install Keras=2.4.3

python -m pip install Keras=2.4.3

```
Command Prompt - python -m pip install keras==2.4.3
Microsoft Windows [Version 10.0.19043.1348]
(c) Microsoft Corporation. All rights reserved.

C:\Users\RAJIV>python -V
Python 3.7.9

C:\Users\RAJIV>python -m pip install keras==2.4.3
Collecting keras==2.4.3
  Downloading Keras-2.4.3-py2.py3-none-any.whl (36 kB)
Collecting scipy>=0.14
  Downloading scipy-1.7.3-cp37-cp37m-win_amd64.whl (34.1 MB)
    |-----| 34.1 MB 2.2 MB/s
Collecting h5py
  Downloading h5py-3.6.0-cp37-cp37m-win_amd64.whl (2.8 MB)
    |-----| 2.8 MB 1.6 MB/s
Collecting numpy>=1.9.1
  Downloading numpy-1.21.4-cp37-cp37m-win_amd64.whl (14.0 MB)
    |-----| 14.0 MB 2.2 MB/s
Collecting pyyaml
  Downloading PyYAML-6.0-cp37-cp37m-win_amd64.whl (153 kB)
    |-----| 153 kB 3.3 MB/s
Collecting cached-property; python_version < "3.8"
  Downloading cached_property-1.5.2-py2.py3-none-any.whl (7.6 kB)
Installing collected packages: numpy, scipy, cached-property, h5py, pyyaml, keras
```

4.2 Install Pickle Version 0.0.1

python -m pip install pickle==0.0.1

```
C:\Users\RAJIV>
C:\Users\RAJIV>python -m pip install pickle4==0.0.1
Collecting pickle4==0.0.1
  Downloading pickle4-0.0.1.tar.gz (19 kB)
Requirement already satisfied: setuptools in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages (from pickle4==0.0.1) (47.1.0)
Using legacy setup.py install for pickle4, since package 'wheel' is not installed.
Installing collected packages: pickle4
  Running setup.py install for pickle4 ... done
Successfully installed pickle4-0.0.1
WARNING: You are using pip version 20.1.1; however, version 21.3.1 is available.
You should consider upgrading via the 'C:\Users\RAJIV\AppData\Local\Programs\Python\Python37\python.exe -m pip install --upgrade pip' command.
C:\Users\RAJIV>
```

4.3 Install mtcnn 0.1.0

python -m pip install mtcnn==0.1.0

```
C:\Users\RAJIV>python -m pip install mtcnn==0.1.0
Collecting mtcnn==0.1.0
  Downloading mtcnn-0.1.0-py3-none-any.whl (2.3 MB)
  |-----| 2.3 MB 2.2 MB/s
Collecting opencv-python==4.1.0
  Downloading opencv_python-4.5.4.60-cp37-cp37m-win_amd64.whl (35.1 MB)
  |-----| 35.1 MB 1.6 MB/s
Requirement already satisfied: keras>=2.0.0 in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages (from mtcnn==0.1.0) (2.4.3)
Requirement already satisfied: numpy>=1.14.5 in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages (from opencv-python==4.1.0->mtcnn==0.1.0) (1.21.4)
Requirement already satisfied: h5py in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages (from keras>=2.0.0->mtcnn==0.1.0) (3.6.0)
Requirement already satisfied: pyyaml in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages (from keras>=2.0.0->mtcnn==0.1.0) (6.0)
Requirement already satisfied: scipy>=0.14 in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages (from keras>=2.0.0->mtcnn==0.1.0) (1.7.3)
Requirement already satisfied: cached-property; python_version < "3.8" in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages (from h5py->keras>=2.0.0->mtcnn==0.1.0) (1.5.2)
Installing collected packages: opencv-python, mtcnn
Successfully installed mtcnn-0.1.0 opencv-python-4.5.4.60
WARNING: You are using pip version 20.1.1; however, version 21.3.1 is available.
You should consider upgrading via the 'C:\Users\RAJIV\AppData\Local\Programs\Python\Python37\python.exe -m pip install --upgrade pip' command.
```

4.4 Install Opencv 4.5.3.56

python -m pip install opencv-python==4.5.3.56

```
C:\Users\RAJIV>python -m pip install opencv-python==4.5.3.56
Collecting opencv-python==4.5.3.56
  Downloading opencv_python-4.5.3.56-cp37-cp37m-win_amd64.whl (34.9 MB)
```

4.5 Install Sk learn 0.24.2

python -m pip install scikit-learn==0.24.2

```
C:\Users\RAJIV>python -m pip install scikit-learn==0.24.2
Collecting scikit-learn==0.24.2
  Downloading scikit_learn-0.24.2-cp37-cp37m-win_amd64.whl (6.8 MB)
  |-----| 6.8 MB 1.7 MB/s
Requirement already satisfied: scipy>=0.19.1 in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages (from scikit-learn==0.24.2) (1.7.3)
Collecting joblib>=0.11
  Downloading joblib-1.1.0-py2.py3-none-any.whl (306 kB)
  |-----| 306 kB 6.4 MB/s
Requirement already satisfied: numpy>=1.13.3 in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages (from scikit-learn==0.24.2) (1.21.4)
Collecting threadpoolctl>=2.0.0
  Downloading threadpoolctl-3.0.0-py3-none-any.whl (14 kB)
Installing collected packages: joblib, threadpoolctl, scikit-learn
```

4.6 Install Tk tools

python -m pip install tk-tools

```
C:\Users\RAJIV>python -m pip install tk-tools
Collecting tk-tools
  Downloading tk_tools-0.14.0-py3-none-any.whl (171 kB)
    |-----| 171 kB 1.3 MB/s
Collecting engineering-notation>=0.5
  Downloading engineering_notation-0.6.0-py3-none-any.whl (5.7 kB)
Installing collected packages: engineering-notation, tk-tools
Successfully installed engineering-notation-0.6.0 tk-tools-0.14.0
WARNING: You are using pip version 20.1.1; however, version 21.3.1 is available.
You should consider upgrading via the 'C:\Users\RAJIV\AppData\Local\Programs\Python\Python37\python.exe -m pip install --upgrade pip' command.
```

4.7 Install Jupyter Notebook

python -m pip install notebook

```
C:\Users\RAJIV\Desktop\Rajiv_final_attendance>python -m pip install notebook
Collecting notebook
  Downloading notebook-6.4.6-py3-none-any.whl (9.9 MB)
    |-----| 9.9 MB 3.3 MB/s
Collecting nbconvert
  Downloading nbconvert-6.3.0-py3-none-any.whl (556 kB)
    |-----| 556 kB 1.3 MB/s
Collecting Jinja2
  Downloading Jinja2-3.0.3-py3-none-any.whl (133 kB)
    |-----| 133 kB 2.2 MB/s
Collecting tornado>=6.1
  Downloading tornado-6.1-cp37-cp37m-win_amd64.whl (422 kB)
    |-----| 422 kB 2.2 MB/s
Collecting traitlets>=4.2.1
  Downloading traitlets-5.1.1-py3-none-any.whl (102 kB)
    |-----| 102 kB 2.2 MB/s
Collecting prometheus-client
  Downloading prometheus_client-0.12.0-py2.py3-none-any.whl (57 kB)
    |-----| 57 kB 2.0 MB/s
Collecting ipython_genutils
  Downloading ipython_genutils-0.2.0-py2.py3-none-any.whl (26 kB)
Collecting argon2-cffi
  Downloading argon2_cffi-21.3.0-py3-none-any.whl (14 kB)
Collecting nest_asyncio>=1.5
  Downloading nest_asyncio-1.5.4-py3-none-any.whl (5.1 kB)
```

4.8 Install Pillow

python -m pip install pillow

```
C:\Users\RAJIV>python -m pip install pillow
Collecting pillow
  Downloading Pillow-8.4.0-cp37-cp37m-win_amd64.whl (3.2 MB)
    |-----| 3.2 MB 2.2 MB/s
Installing collected packages: pillow
Successfully installed pillow-8.4.0
WARNING: You are using pip version 20.1.1; however, version 21.3.1 is available.
You should consider upgrading via the 'C:\Users\RAJIV\AppData\Local\Programs\Python\Python37\python.exe -m pip install --upgrade pip' command.

C:\Users\RAJIV>
```

4.9 Install Tensor Flow 2.4.1

python -m pip install tensorflow==2.4.1

```
C:\Users\RAJIV>python -m pip install tensorflow==2.4.1
Collecting tensorflow==2.4.1
  Downloading tensorflow-2.4.1-cp37-cp37m-win_amd64.whl (370.7 MB)
    |-----| 80.0 MB 2.2 MB/s eta 0:02:14
```

4.10 Install Pandas

python -m pip install pandas

```
C:\Users\RAJIV>python -m pip install pandas
Collecting pandas
  Downloading pandas-1.3.5-cp37-cp37m-win_amd64.whl (10.0 MB)
    |-----| 10.0 MB 930 kB/s
Requirement already satisfied: numpy>=1.17.3; platform_machine != "aarch64" and platform_machine != "arm64" and python_v
ersion < "3.10" in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages (from pandas) (1.19.5)
Collecting pytz>=2017.3
  Downloading pytz-2021.3-py2.py3-none-any.whl (503 kB)
    |-----| 503 kB 3.3 MB/s
Requirement already satisfied: python-dateutil>=2.7.3 in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-
packages (from pandas) (2.8.2)
Requirement already satisfied: six>=1.5 in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages (from
python-dateutil>=2.7.3->pandas) (1.15.0)
Installing collected packages: pytz, pandas
```

4.11 Install Matplot lib

python -m pip install matplotlib

```
C:\Users\RAJIV>python -m pip install matplotlib
Collecting matplotlib
  Downloading matplotlib-3.5.1-cp37-cp37m-win_amd64.whl (7.2 MB)
    |-----| 7.2 MB 1.1 MB/s
Requirement already satisfied: pyparsing>=2.2.1 in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packag
es (from matplotlib) (3.0.6)
Collecting cycler>=0.10
  Downloading cycler-0.11.0-py3-none-any.whl (6.4 kB)
Requirement already satisfied: pillow>=6.2.0 in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages
 (from matplotlib) (8.4.0)
Requirement already satisfied: packaging>=20.0 in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packag
es (from matplotlib) (21.3)
Requirement already satisfied: numpy>=1.17 in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-packages (f
rom matplotlib) (1.19.5)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\rajiv\appdata\local\programs\python\python37\lib\site-pa
ckages (from matplotlib) (2.8.2)
Collecting fonttools>=4.22.0
  Downloading fonttools-4.28.3-py3-none-any.whl (884 kB)
    |-----| 884 kB 3.2 MB/s
```

4.12 Install Open Pyxl Library

python -m pip install openpyxl

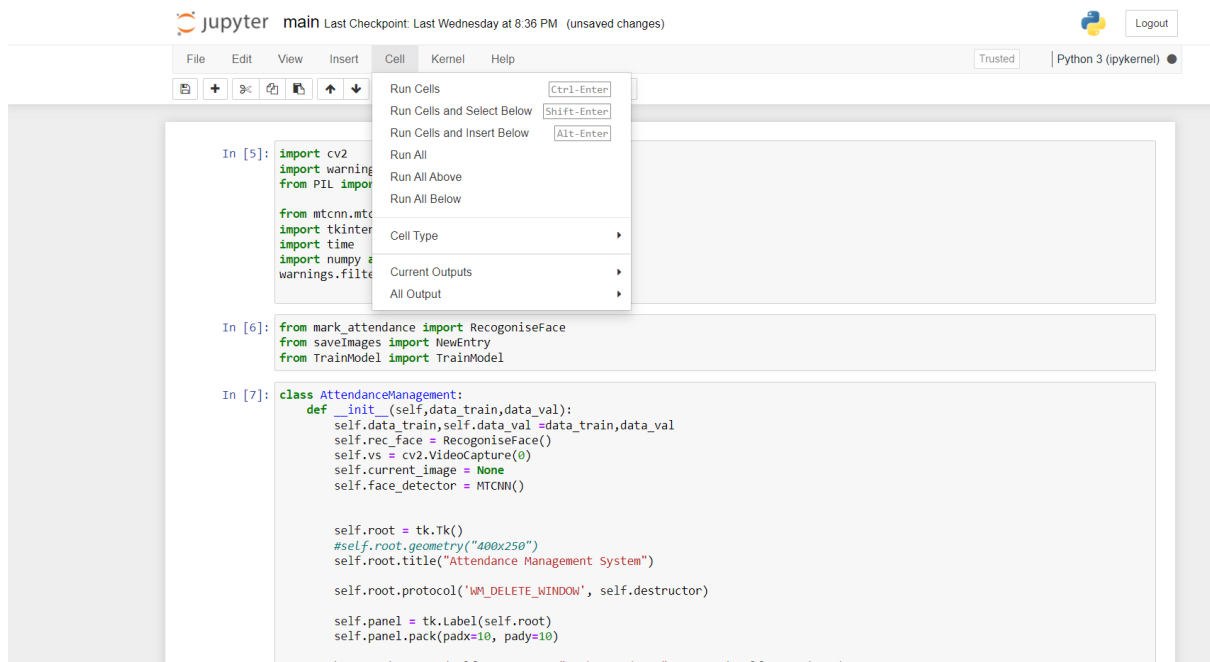
```
C:\Users\RAJIV>python -m pip install openpyxl
Collecting openpyxl
  Downloading openpyxl-3.0.9-py2.py3-none-any.whl (242 kB)
    |-----| 242 kB 1.7 MB/s
Collecting et_xmlfile
  Downloading et_xmlfile-1.1.0-py3-none-any.whl (4.7 kB)
Installing collected packages: et_xmlfile, openpyxl
Successfully installed et_xmlfile-1.1.0 openpyxl-3.0.9
WARNING: You are using pip version 20.1.1; however, version 21.3.1 is available.
You should consider upgrading via the 'C:\Users\RAJIV\AppData\Local\Programs\Python\Python37\python.exe -m pip install
--upgrade pip' command.
```

4.13 Run Jupyter Notebook

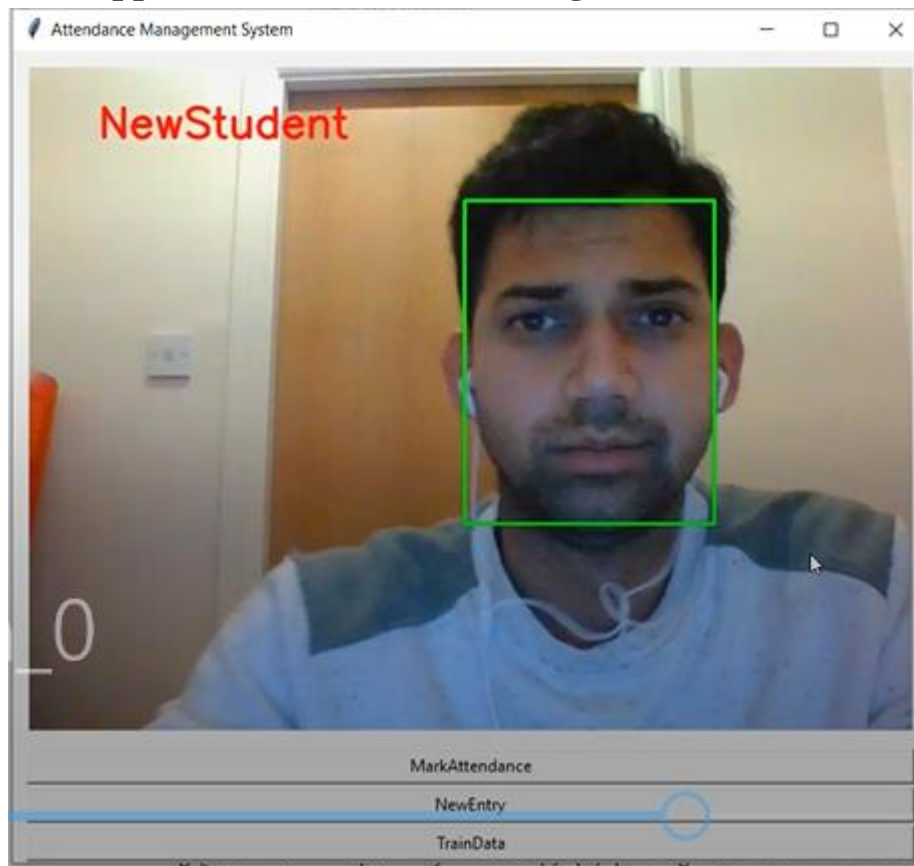
```
C:\Users\RAJIV>python -m notebook
[I 15:31:14.115 NotebookApp] Serving notebooks from local directory: C:\Users\RAJIV
[I 15:31:14.115 NotebookApp] Jupyter Notebook 6.4.6 is running at:
[I 15:31:14.131 NotebookApp] http://localhost:8888/?token=63f59fd2de3cf24c4a75da1dc8903fd196a50f5543652678
[I 15:31:14.131 NotebookApp] or http://127.0.0.1:8888/?token=63f59fd2de3cf24c4a75da1dc8903fd196a50f5543652678
[I 15:31:14.131 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 15:31:14.150 NotebookApp]

To access the notebook, open this file in a browser:
  file:///C:/Users/RAJIV/AppData/Roaming/jupyter/runtime/nbserver-8532-open.html
Or copy and paste one of these URLs:
  http://localhost:8888/?token=63f59fd2de3cf24c4a75da1dc8903fd196a50f5543652678
  or http://127.0.0.1:8888/?token=63f59fd2de3cf24c4a75da1dc8903fd196a50f5543652678
```

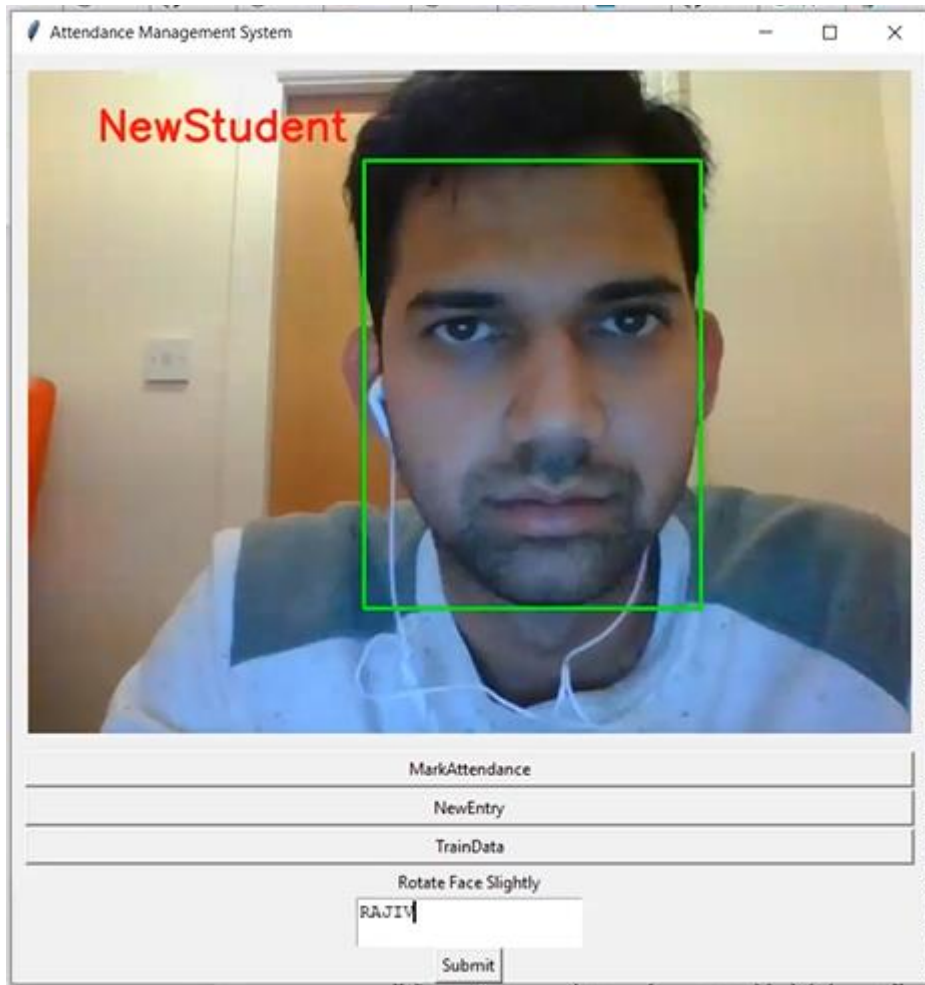

4.14 Open main.ipynb and Run All cells of code



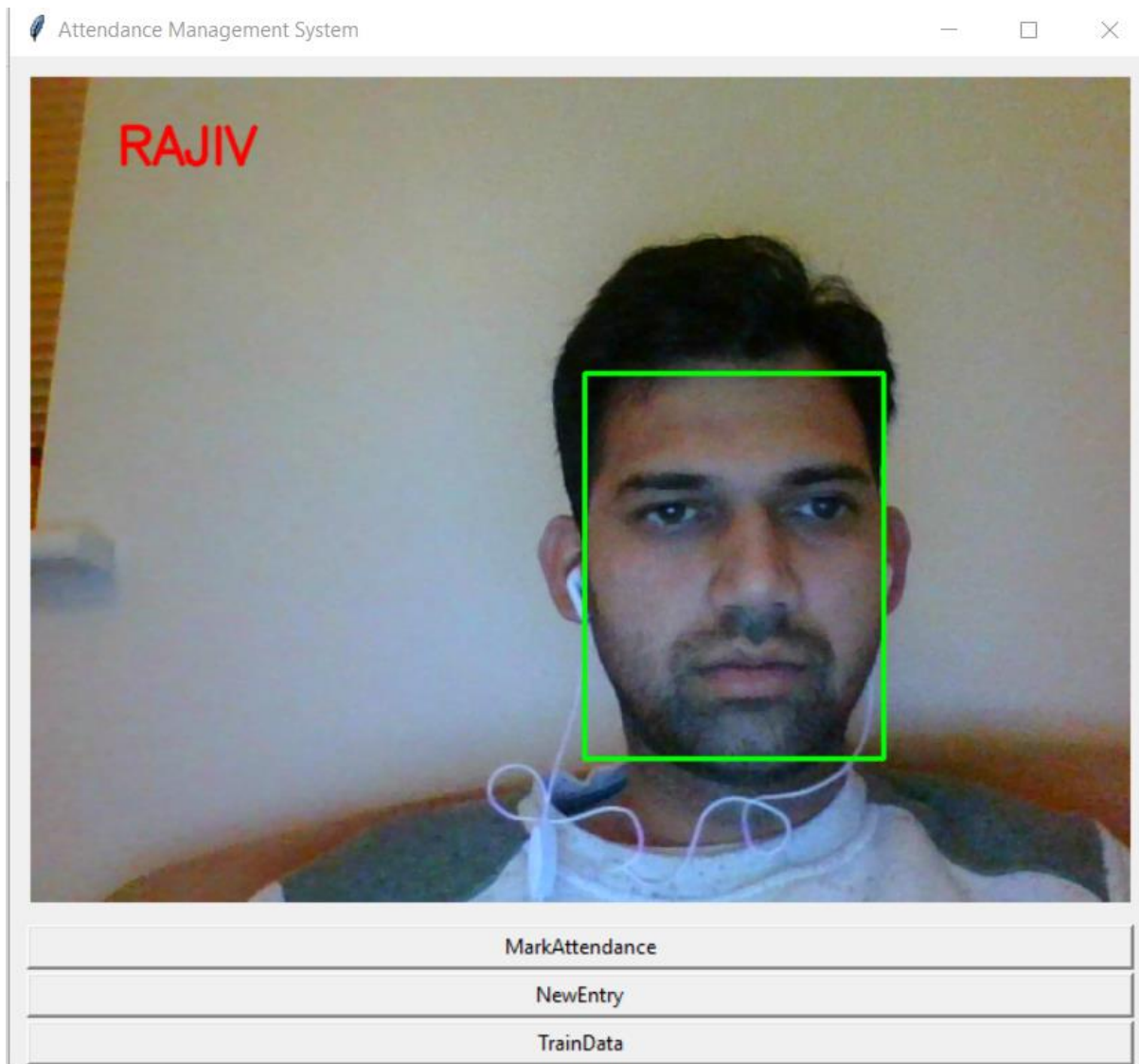
4.15 Application Start and detecting Face



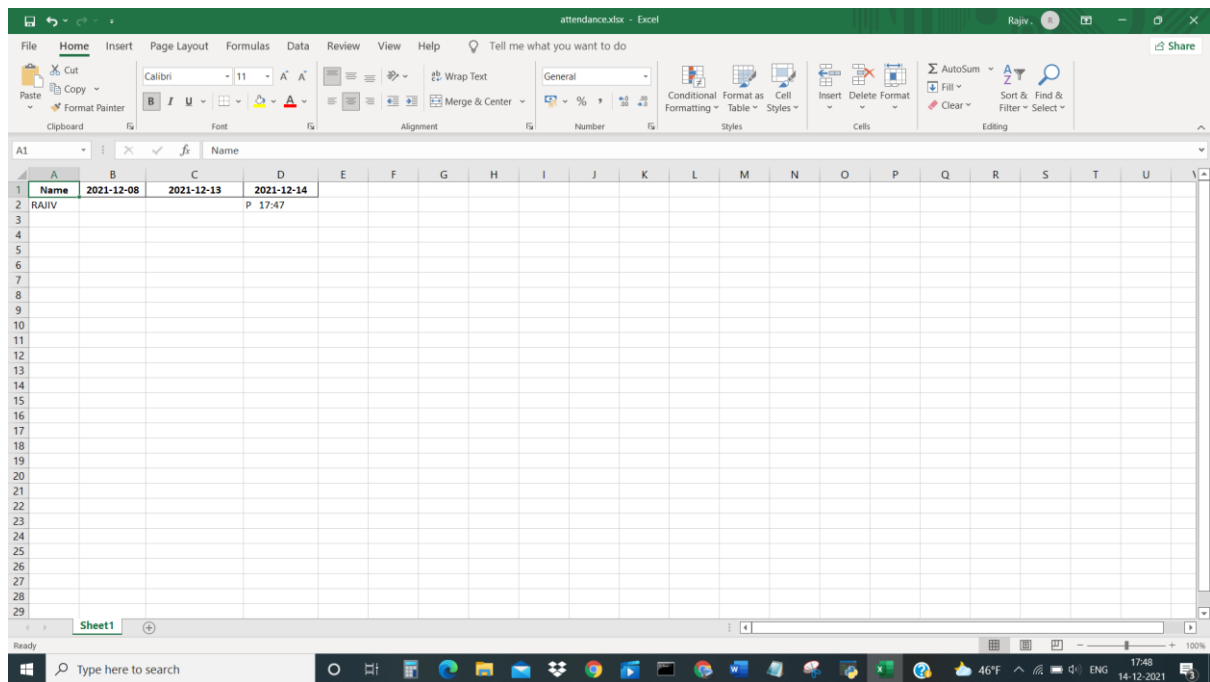
4.16 Click New Entry, Enter name and submit



4.17 Face will be Recognize after model is trained



4.18 Click MarkAttendance after training of model



4.19 Student Attendance is Saved

References

Vidhya, D. (2021, November 16). *Face Recognition Python- Popular Techniques and Libraries*. Retrieved December 14, 2021, from Digital Vidhya: <https://www.digitalvidya.com/blog/face-recognition-python/>