INSTALL LIBRARIES

DLIB

Make available as much RAM as possible

Increase swap file size

$ sudo nano /etc/dphys-swapfile

Change:

CONF_SWAPSIZE=100

To:

CONF_SWAPSIZE=1024

Restart the service

$ sudo /etc/init.d/dphys-swapfile stop

$ sudo /etc/init.d/dphys-swapfile start

Check:

$ free -m

Change boot options and memory split

$ sudo raspi-config

Select:

Boot Options => Desktop / CLI => Console Autologin

In:

Advanced Options => Memory Split

write 16

Restart the raspberry Pi

Install dlib prerequisites

$ sudo apt-get update

$ sudo apt-get install build-essential cmake

$ sudo apt-get install libgtk-3-dev

$ sudo apt-get install libboost-all-dev

$ sudo apt-get install python-numpy

$ sudo apt-get install python-scipy

Install dlib (it may take few hours)

```
$ sudo pip install dlib
```

Test everything worked

```
$ python
>> import dlib
```

Reset swap file size, boot option and memory split

Swap file size

```
$ sudo nano /etc/dphys-swapfile
        Change:
                CONF_SWAPSIZE=1024
        To:
                CONF_SWAPSIZE=100
Restart the service
        $ sudo /etc/init.d/dphys-swapfile stop
        $ sudo /etc/init.d/dphys-swapfile start
Check:
        $ free -m
```

Boot options and memory split

```
$ sudo raspi-config
Select:
        Boot Options => Desktop / CLI => Desktop Autologin

In:
        Advanced Options => Memory Split
write 128 (it is what I had there, internet says 64)
```

Restart the raspberry Pi

OpenCV

Update the raspberry

```
$ sudo apt-get update && sudo apt-get upgrade
```

Install tools and dependencies

```
$ sudo apt-get install build-essential cmake pkg-config
$ sudo apt-get install libjpeg-dev libtiff5-dev libjasper-dev libpng12-dev
$ sudo apt-get install libavcodec-dev libavformat-dev libswscale-dev
libv4l-dev
$ sudo apt-get install libxvidcore-dev libx264-dev
$ sudo apt-get install libgtk2.0-dev libgtk-3-dev
$ sudo apt-get install libatlas-base-dev gfortran
$ sudo apt-get install python2.7-dev python3-dev
$ sudo apt-get install python-numpy
```

Change swap file size

```
$ sudo nano /etc/dphys-swapfile
        Change:
                CONF_SWAPSIZE=1024
        To:
                CONF_SWAPSIZE=100
Restart the service
        $ sudo /etc/init.d/dphys-swapfile stop
        $ sudo /etc/init.d/dphys-swapfile start
Check:
        $ free -m
```

Download source code

```
$ cd ~

$ wget -O opencv.zip
https://github.com/Itseez/opencv/archive/3.3.0.zip
$ unzip opencv.zip

$ wget -O opencv_contrib.zip
https://github.com/Itseez/opencv_contrib/archive/3.3.0.zip
$ unzip opencv_contrib.zip
```

Compilation (it can take few hours)

```
$ cd ~/opencv-3.3.0/
$ mkdir build
$ cd build
$ cmake -D CMAKE_BUILD_TYPE=RELEASE \
    -D CMAKE_INSTALL_PREFIX=/usr/local \
    -D INSTALL_PYTHON_EXAMPLES=ON \
```

```
    -D
OPENCV_EXTRA_MODULES_PATH=~/opencv_contrib-3.3.0/module
s \
    -D BUILD_EXAMPLES=ON ..

$ make -j4
```

Others

ImageTk

```
$ sudo apt-get install python-imaging python-imaging-tk
```

THE SOURCE CODE

Structure

The structure is fixed because some relative paths are hard coded into the code.

```
/home/pi/Projects/smart_photo_frame/ |
                                     | cv_haarcascades_trained_models/...
                                     | dlib_trained_face_shape_predictor_model/...
                                     | photos/
                                     | SmartFrameApp.py
                                     | extract_photos.py
                                     | Face.py
                                     | ImageFace.py
                                     | SmartFrameGUI.py
                                     | SmartFrameApp.py
                                     | extract_photos.py
                                     | saved_avg_face.pckl
```

Programs

If you want to run the main program:

```
$ python SmartFrameApp.py
```

If there is a saved average face (saved_avg_face.pckl) it will load it and start from there, so if you want to start from zero delete the saved average face.

In the code there are two different classes, one with the preview and another without it (the difference in the code are 2 lines, you'll see them commented).
If you have a saved average face and you want to extract all the photos run:

```
$ python extract_photos.py
```

It will extract all the photos in the photos directory