Automatic Photo Cropping, Resizing and Background Removal and Replacement

Adikari A.M.H.I (E/14/009)
Adikari A.M.N.P (E/14/010)
Ruwantha J.M.D.K (E/14/298)
Dilshan I.D.H.I (E/14/410)

Department of Computer Engineering, University of Peradeniya

Proposal

Introduction

This is a project to automate the manual processing of photos of students taken to put on feels to overcome the difficulty of processing due to students with different heights such that the camera can be fixed still and no need of manual processing to adjust the face to the centre.
This is done using automatic cropping, resizing.
The background of the photo is to be removed and replaced with the respective color of the faculty (Pink for faculty of Engineering).

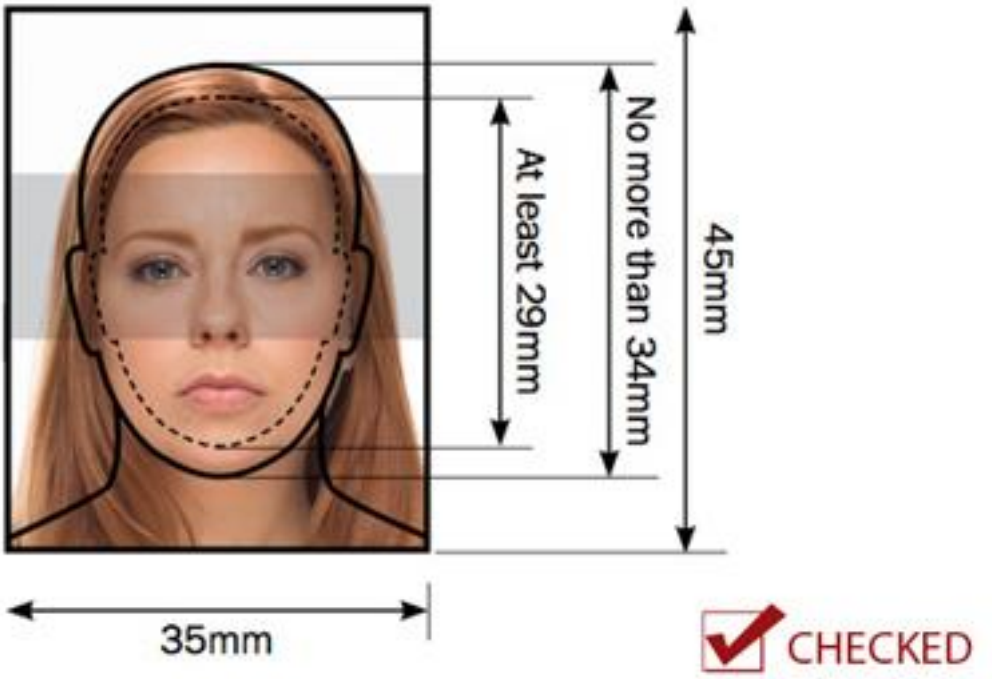
Problem Description

In the current way the student photos for the feels is taken, It is much difficult and time consuming for the photographers as well as photo editing people to do it as they have to manually adjust the camera for each student as they are with different heights and faces are not directly at the centre of the image taken. Also they have to manually process the images one by one to remove the background and to replace with pink color. So this project is aimed to automate this process where no manual adjusting of camera nor photo editing is required.

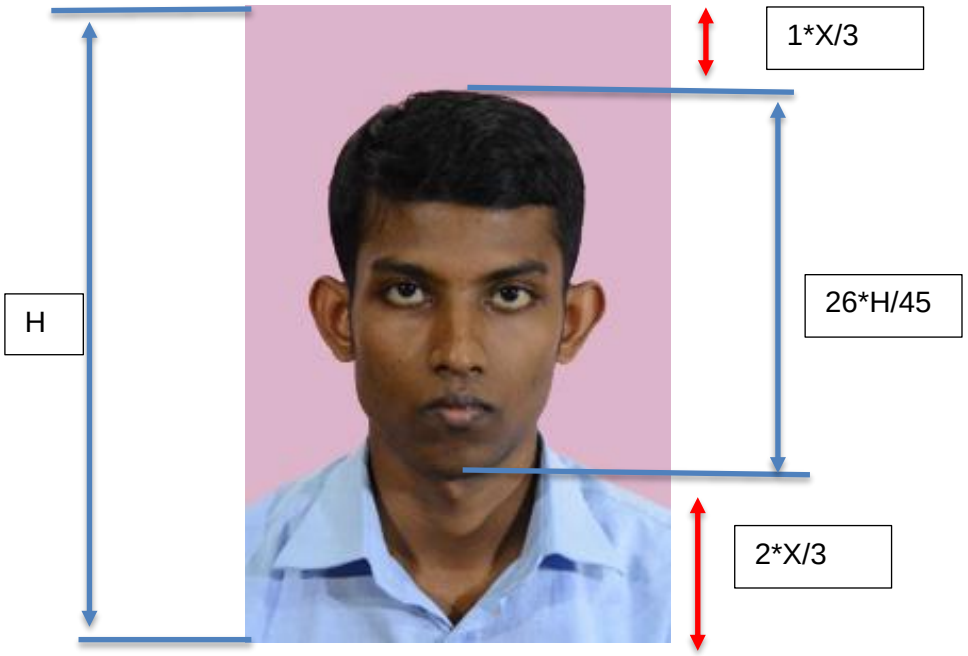
Solution Description

All the photos are taken using a camera placed still. Only thing that will be needed to bother for the photographer is that the image must contain the complete upper body picture of the student.
All the photos needed to be given as an input the program we are developing.
Also the needed output image size must be given as an input.
The the program identifies the position of the face. Then it crops or resize based on the conditions such that the face is positioned in a fixed place of the image(Decided at the beginning).
The background is then removed and replaced with a given color.
Then the image set is given as an output to the system.

Passport Image – Details of Image



FeeLs Image – Details of Image



Structure of the System

Inputs of the system

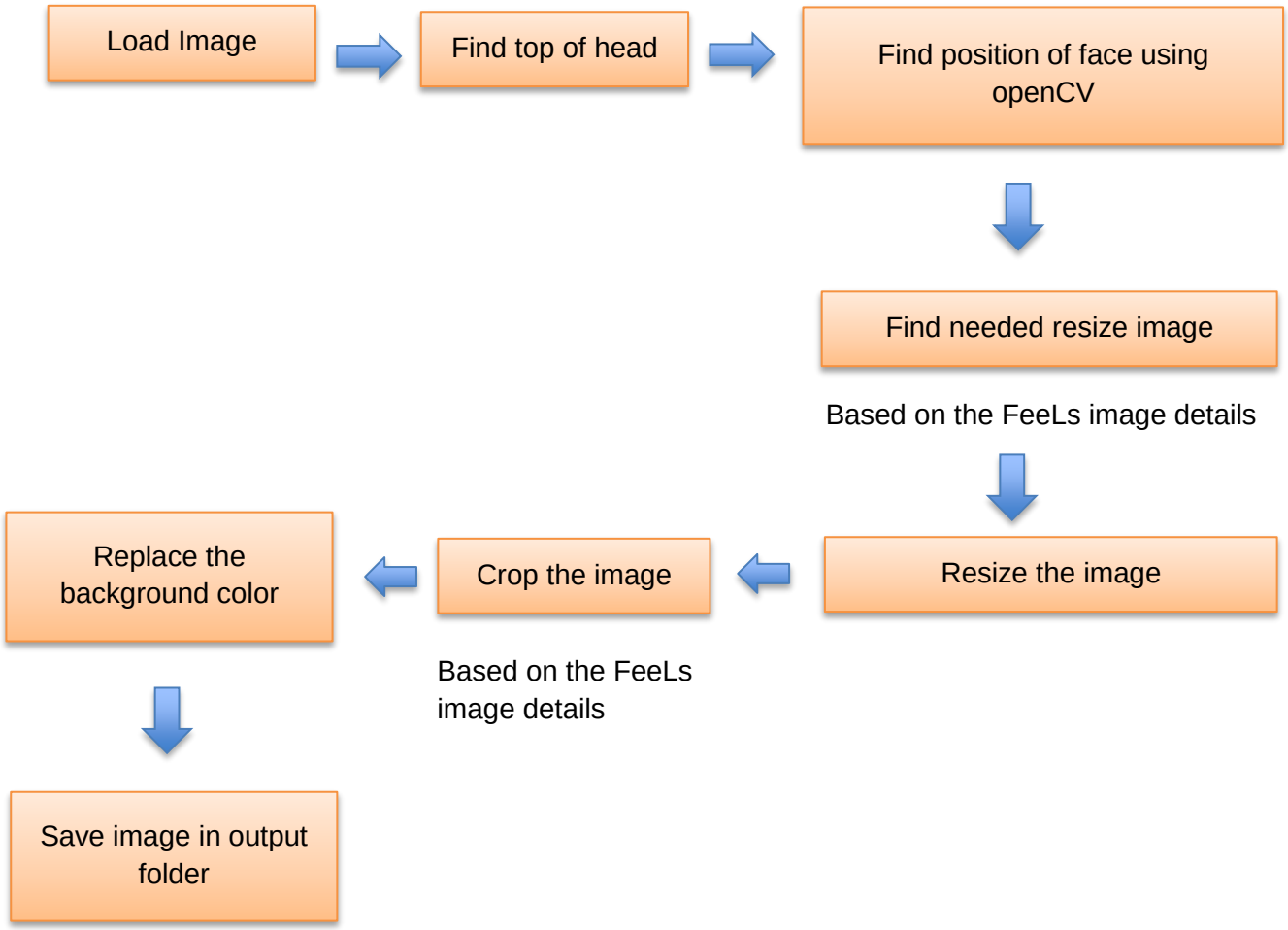
Input image folder

Output image folder

Needed image size

Needed image background color

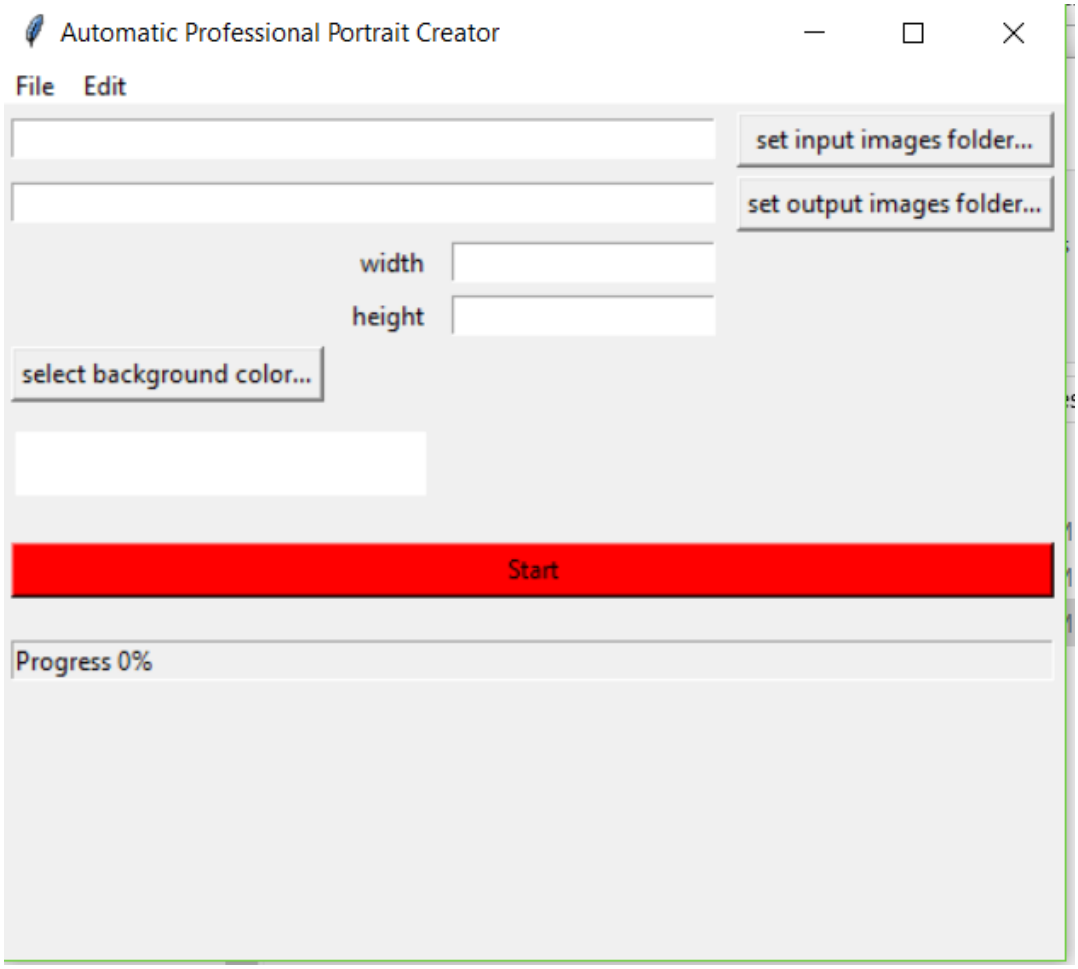
How system work



Technologies – Libraries

- **Python 3.7**
- **Pillow – for image manipulations using python**
- **openCV – for face position identification**

Solution – GUI



Solution - Testing

We used few images with different properties for testing and the outputs were obtained.

Let’s see the images we used for testing.

Test Image 1

This is a normal image that is not so zoomed. But just need few resizing. Image is a female person. Jacket is black. Hair is black

Test Image 2

This is a male person image that is zoomed out some extent. Colored cloth. And white color person.

Test Image 3

This is a male person image that is zoomed out much.

Test Image 4

This is a male person image that is zoomed out and wearing a white T shirt

Test Image 5

This is a male person image that is zoomed out and wearing a white shirt (shirt color somewhat similar to background color)

Output Images from the System

USER MANUAL FOR USING

1. First unzip the APPC-PERA.zip file in any place in your computer.
2. Two file will be created, APPC-PERA.exe and haarcascade_frontalface_default.xml
3. Create a shortcut to the . APPC-PERA.exe in your desktop if needed.
4. Just run the APPC-PERA.exe by double clicking on it.
5. Now the GUI given above will show up.
6. Put all the images you want to process into a same folder.
7. Image files should be jpg file for APPC-PERA version 1.
8. Create an empty folder to put output images.
9. Now select the input and output folders in the GUI.
10. Give the output image width and height.
11. Choose the background color you want to have by clicking ‘Select background color’ button
12. Click start button
13. Wait until the progress bar become 100%. Do not close the window.
14. Now you are finished with processing. See output image folder.

Task breakdown in the group

name	Task	email
Hishan Indrajith (E/14/009)	Face position Identification	hishan.indrajith.95hia@gmail.com
Nadun Priyankara (E/14/010)	Cropping and Resizing	nadunp94@gmail.com
Jayamal Jayamaha (E/14/298)	Background Removal and Replacing	jayamaljayamaha2@gmail.com
Hasitha Iroshana (E/14/410)	GUI creation	hidilshan70@gmail.com