



Snapchat AR filter (Photo Editor)

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Objectives



- To build a photo editor with basic augmented reality
- To build a feature for improving contrast of a photo
- To build a feature for error correction of an image using Gaussian blur and median filter.
- To use RGBA channel format for image blending

Introduction



Snapchat AR filter is a photo editor where user can add

- AR glasses
- AR Nose
- Dog like face
- Hat above the head of the person present.
- Mustache
- Better contrast
- Noise reduction

Methodology



For AR filter:

- Detect the target area using Haar Cascade classifier.
- Use RGBA channel (A channel represents the transparency of pixels)
- Resize the filter to fit with the image accordingly
- Blend the main image and filter for final output

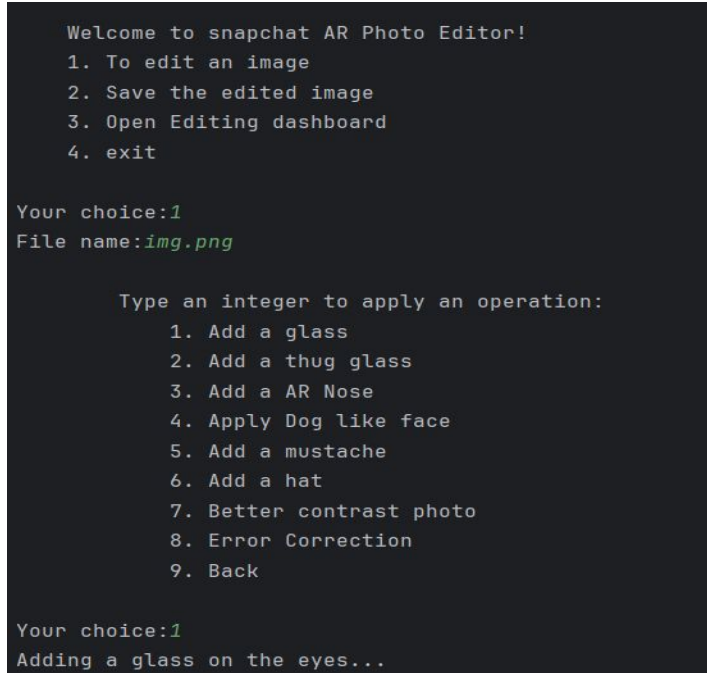
Methodology (continue)



For improving contrast and noise reduction

- Apply histogram equalization to improve contrast
- Apply median filter for salt and pepper noise reduction
- Apply gaussian blur for overall noise reduction

Feature Demonstration (Dashboard)

A terminal window with a dark background and light green text. It shows the welcome message, a list of four options, a user choice of 1, the file name 'img.png', a second list of nine options, another user choice of 1, and the message 'Adding a glass on the eyes...'.

```
Welcome to snapchat AR Photo Editor!
1. To edit an image
2. Save the edited image
3. Open Editing dashboard
4. exit

Your choice:1
File name:img.png

Type an integer to apply an operation:
1. Add a glass
2. Add a thug glass
3. Add a AR Nose
4. Apply Dog like face
5. Add a mustache
6. Add a hat
7. Better contrast photo
8. Error Correction
9. Back

Your choice:1
Adding a glass on the eyes...
```

The photo in the left shows the dashboard of this editor.

Figure 1: Dashboard

Feature Demonstration (AR glass)



Figure 2: Detected Eyes



Figure 3: Blended output

Feature Demonstration (AR thug glass)

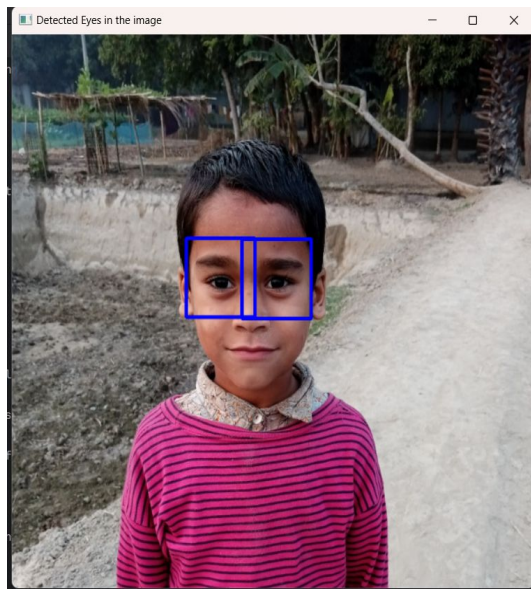


Figure 4: Detected Eyes



Figure 5: Blended output

Feature Demonstration (AR Nose)

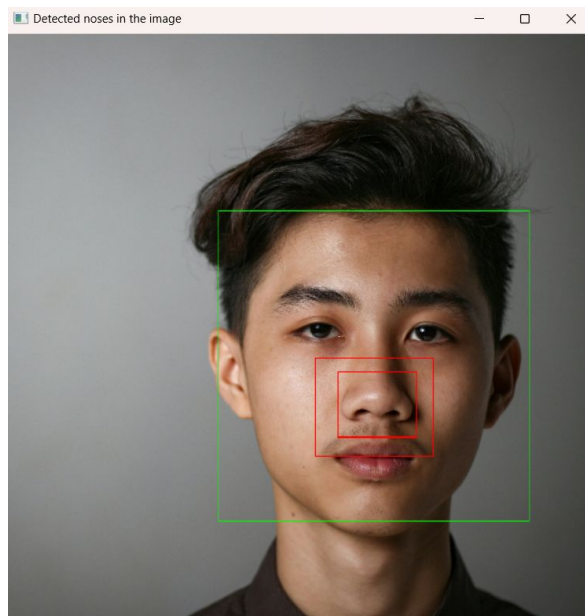


Figure 6: Detected Nose

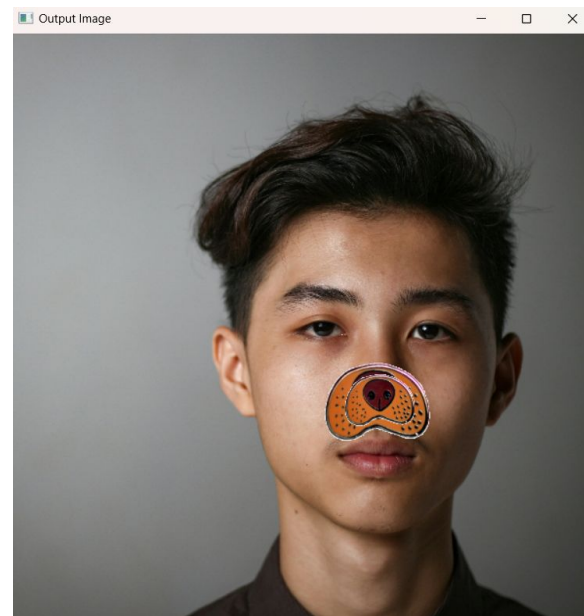


Figure 7: Blended output

Feature Demonstration (Dog like face)

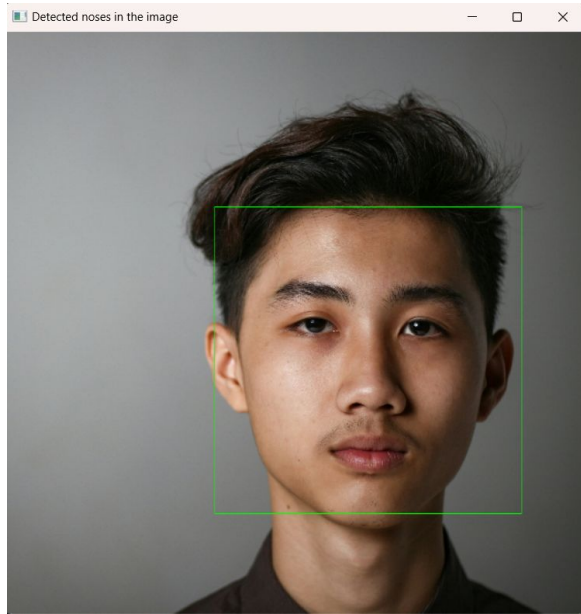


Figure 8: Detected face

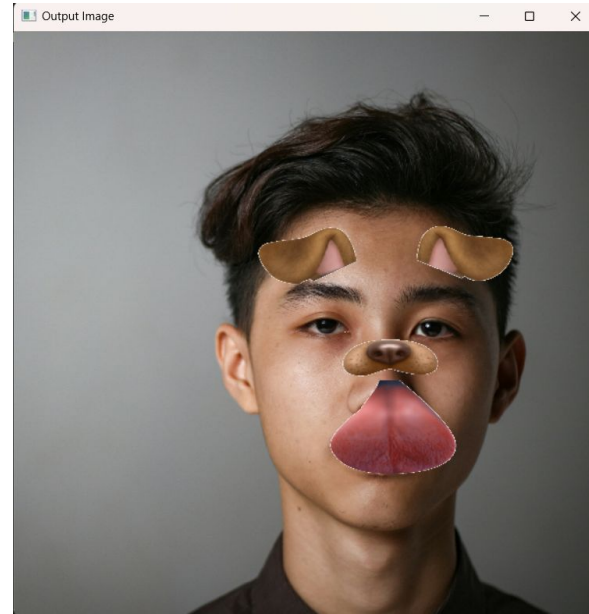


Figure 9: Blended output

Feature Demonstration (Mustache)

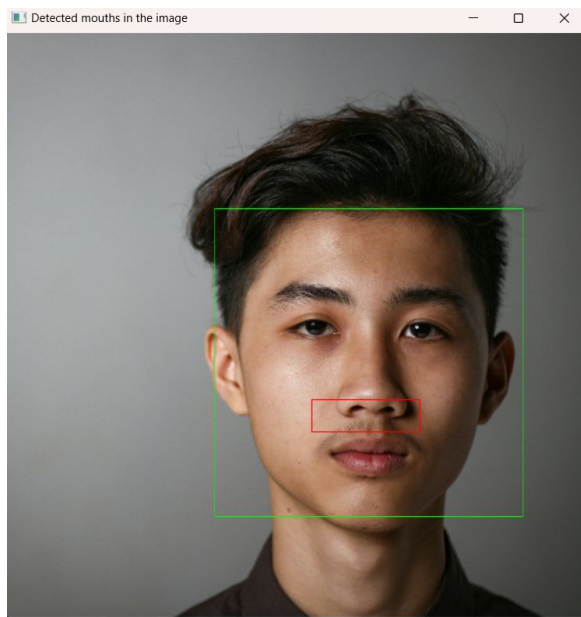


Figure 10: Detected upper lip space

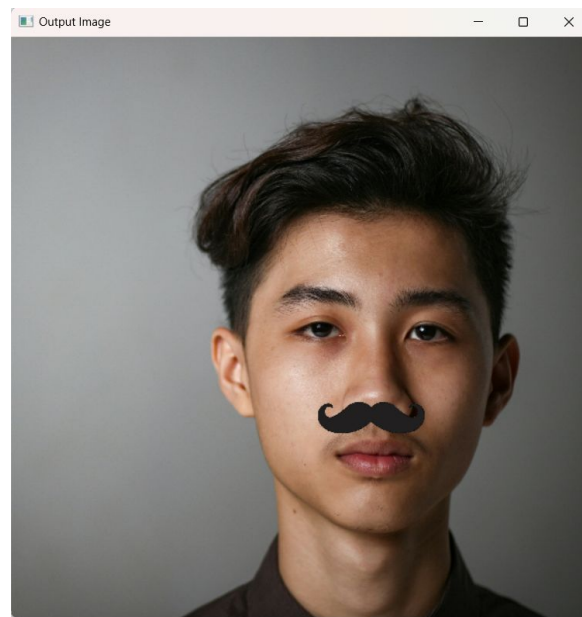


Figure 11: Blended output

Feature Demonstration (AR Hat)

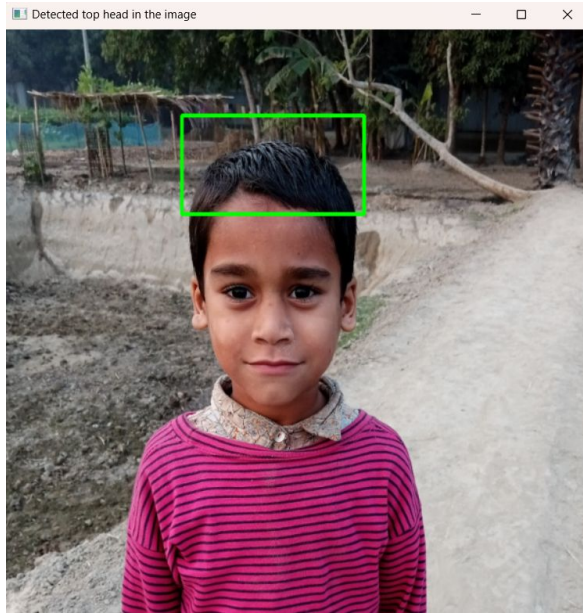


Figure 12: Detected Upper head



Figure 13: Blended output

Feature Demonstration (Improved contrast)



Figure 14: Input Image

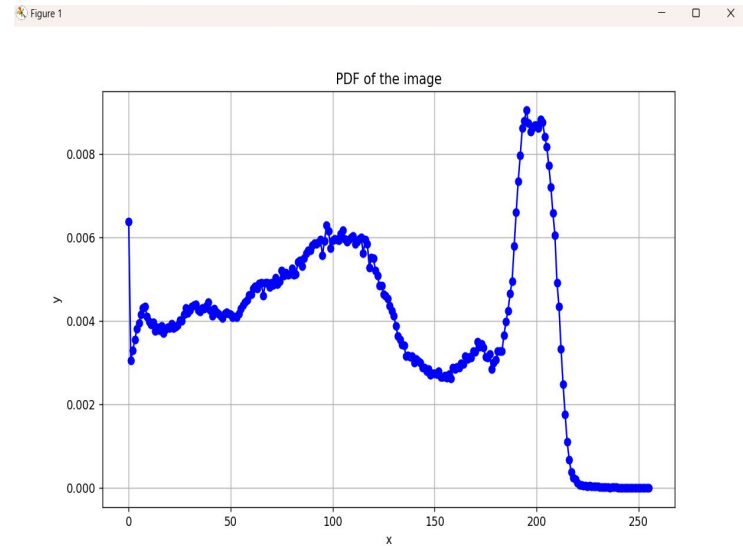


Figure 15: PDF of the histogram

Feature Demonstration (Improved contrast)

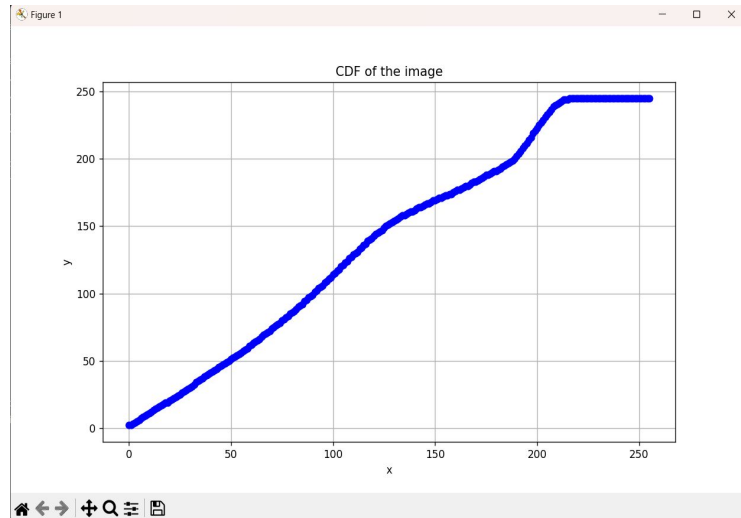


Figure 16: CDF of the histogram



Figure 17: Histogram equalized image

Feature Demonstration (Noise reduction)



Figure 18: Noisy Image

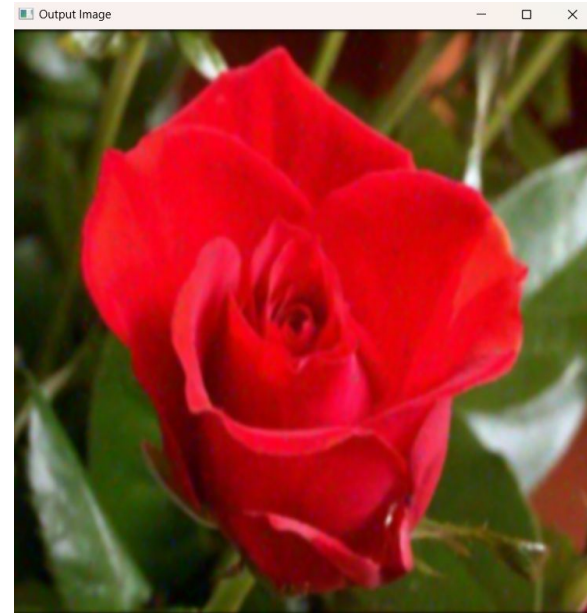


Figure 19: Corrected
output

Reference



[1] OpenCV documentation (<https://docs.opencv.org/4.x/>)

[2] Haar Cascade Algorithm
(<https://www.javatpoint.com/haar-cascade-algorithm>)



Thank you