



Visual Adjustment & Layer Operator

F U N D A M E N T A L O F I M A G E P R O C E S S I N G

Section : 02

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Group Members

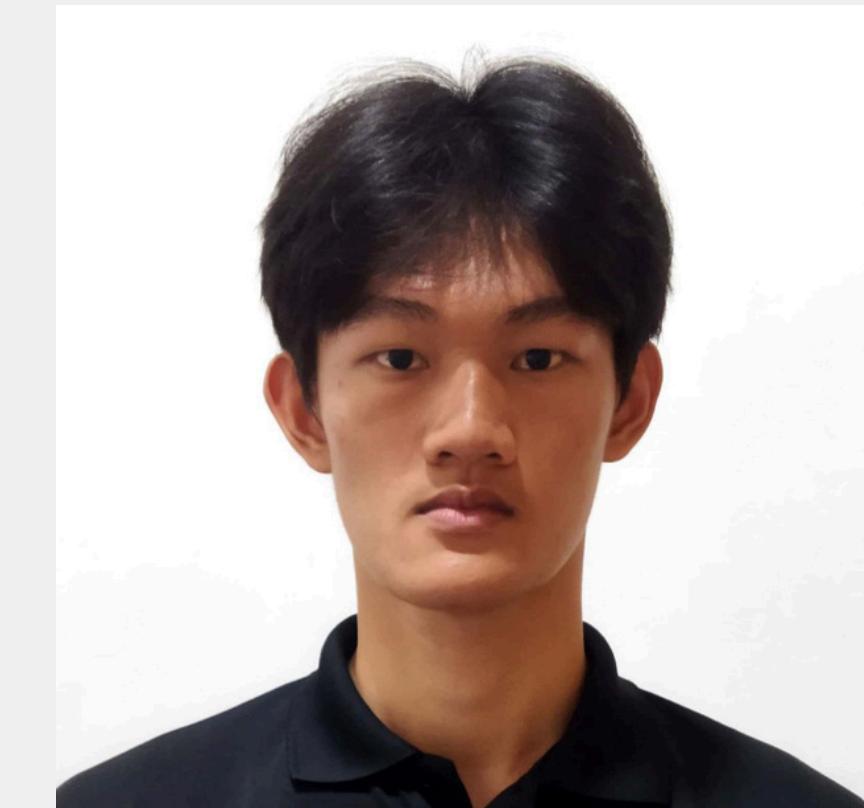
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Introduction

Visual Adjustment & Layer Operator (V.A.L.O.) is an image manipulating software developed using Python and OpenCV. It allows users to upload images and apply various editing operation such brightness, contrast adjustment, cropping, noise reduction, blurring, sharpening, background removal and filter effects and then save the edited image. The software provides an interactive graphical user interface that enables users to select editing modes and adjust parameters easily.



Proposed Task

Allow users to upload images

V.A.L.O. allows user to upload their desired images to perform image manipulation.

Allow users to save output images

V.A.L.O. allows user to save the edited image to the local devices.



Proposed Task

Brighten and Darken

V.A.L.O. is able to perform brightening and darkening process to certain selected regions in the image with adjustable scale.

Image Cropping

V.A.L.O. can perform image cropping to remain certain area by resizing the image.

Blurring and Sharpening

V.A.L.O. can blur and sharpen certain area on the image with adjustable scale.



Proposed Task

Noise Reduction

V.A.L.O. has noise reduction feature to reduce noises on the image using median filter.

Background Removal

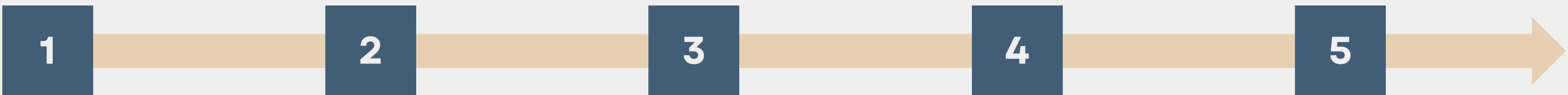
V.A.L.O. is able to remove background of the image.

Filter effects

V.A.L.O. can apply filter on image by adjusting the RGB of the image.



Process Flow



Upload Image

**Mode
Selection**

**Image
Manipulation**

**Parameter
adjustment**

Save Image



Proposed Interface & Interaction

Home Page

V.A.L.O.

Welcome to V.A.L.O.

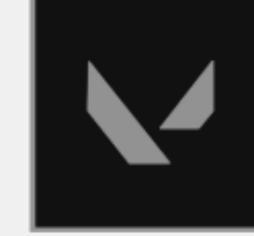
Let's starts by upload a image.

No image?
Try one of these:



An empty rectangular area with a large upward arrow icon and a blue "Upload Image" button.

V.A.L.O.



Welcome to V.A.L.O.

Let's starts by upload a image.

Upload Image

No image? Try one of these:

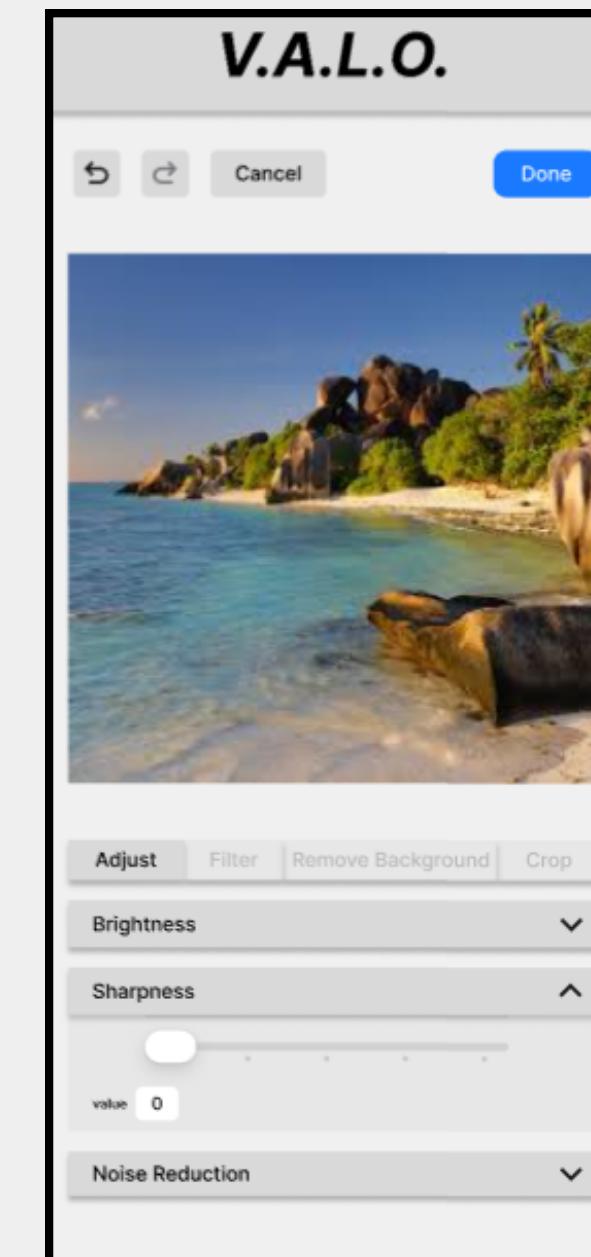
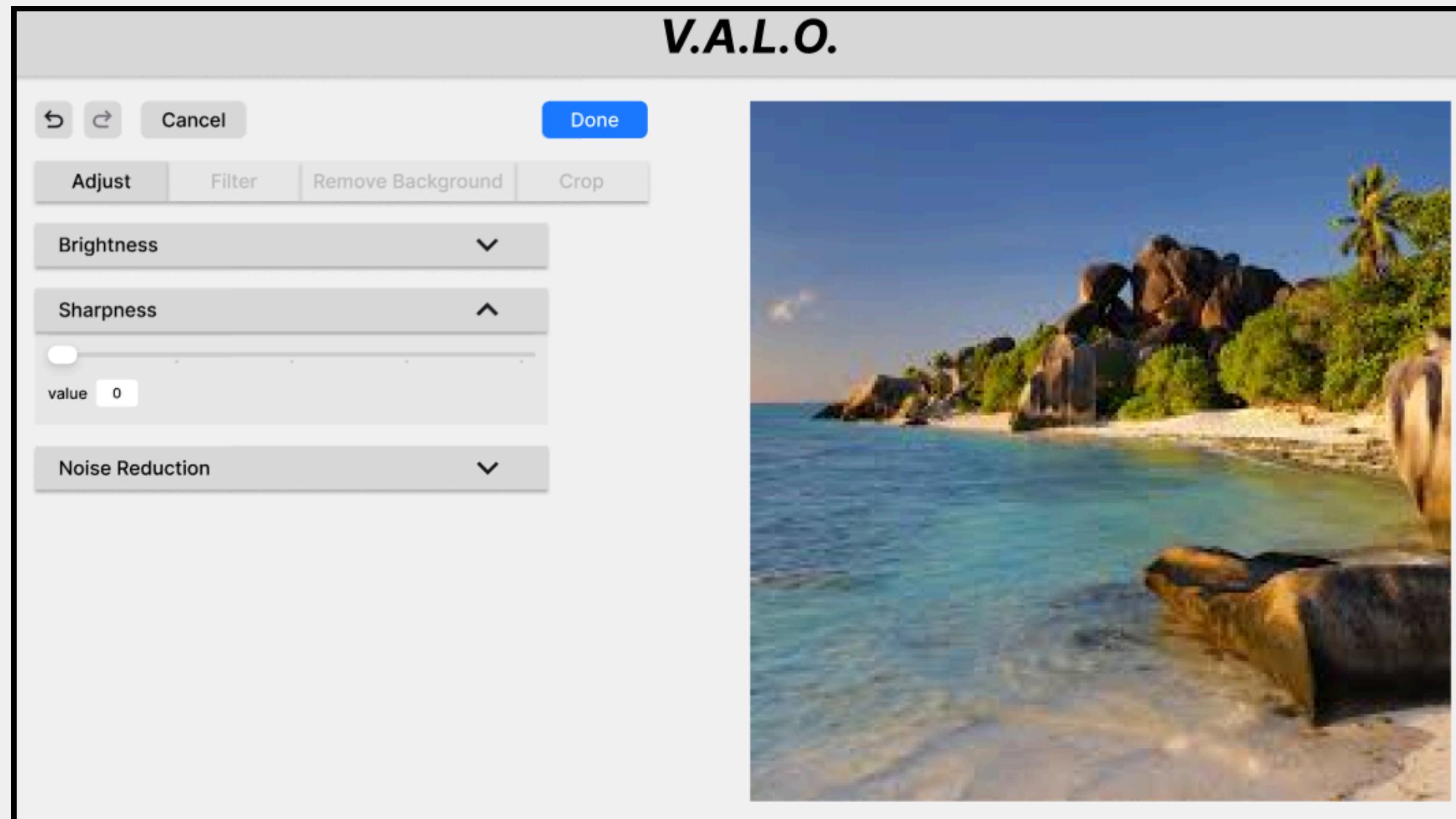


[view in Figma](#)



Proposed Interface & Interaction

Adjust Mode



[view in Figma](#)



Proposed Interface & Interaction

Filter Mode

V.A.L.O.

Done

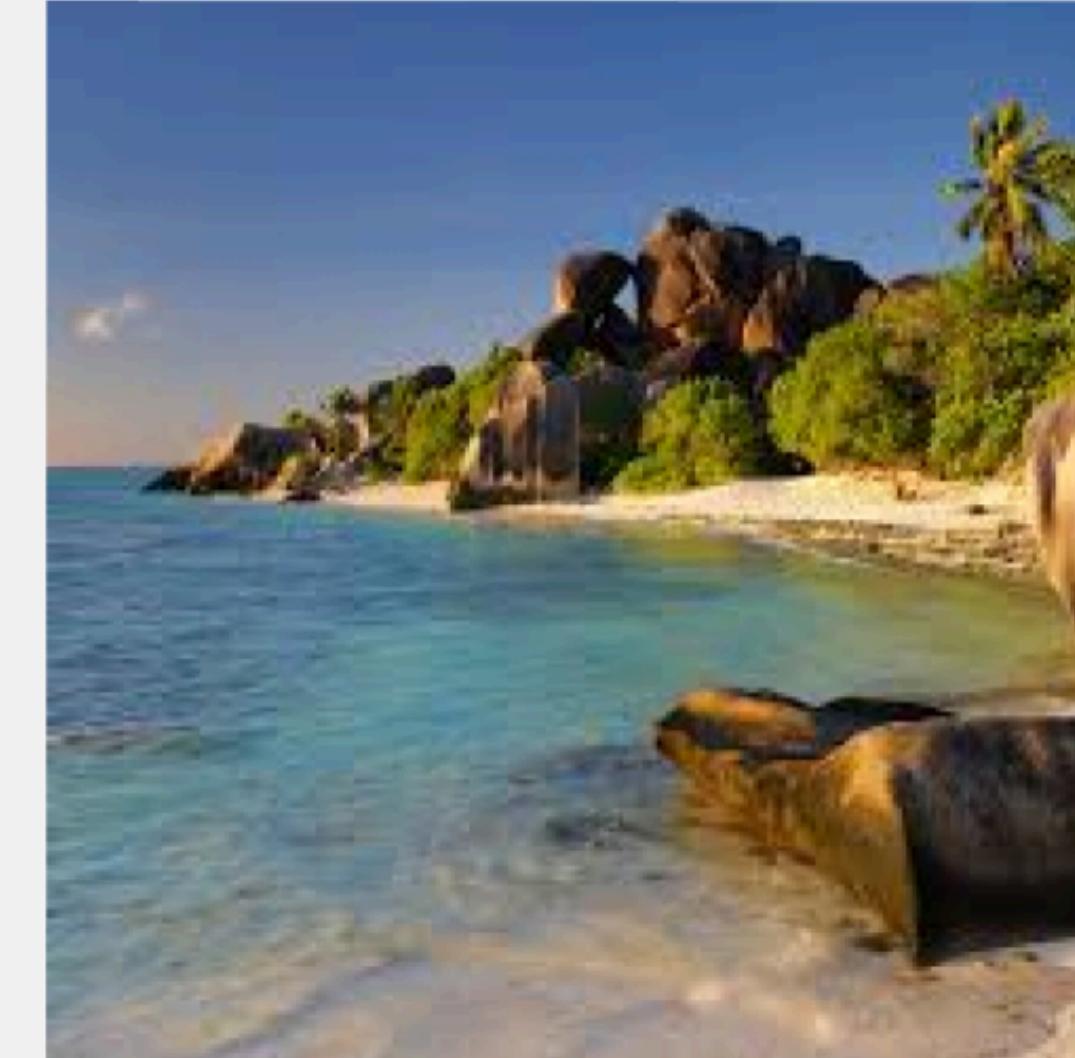
Cancel

Adjust Filter Remove Background Crop

Red
value 0

Green
value 0

Blue
value 0

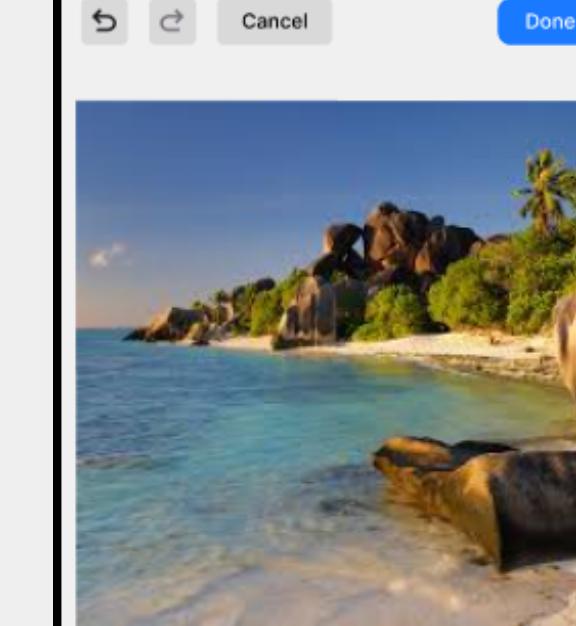


V.A.L.O.

Done

Cancel

Adjust Filter Remove Background Crop



Red
value 0

Green
value 0

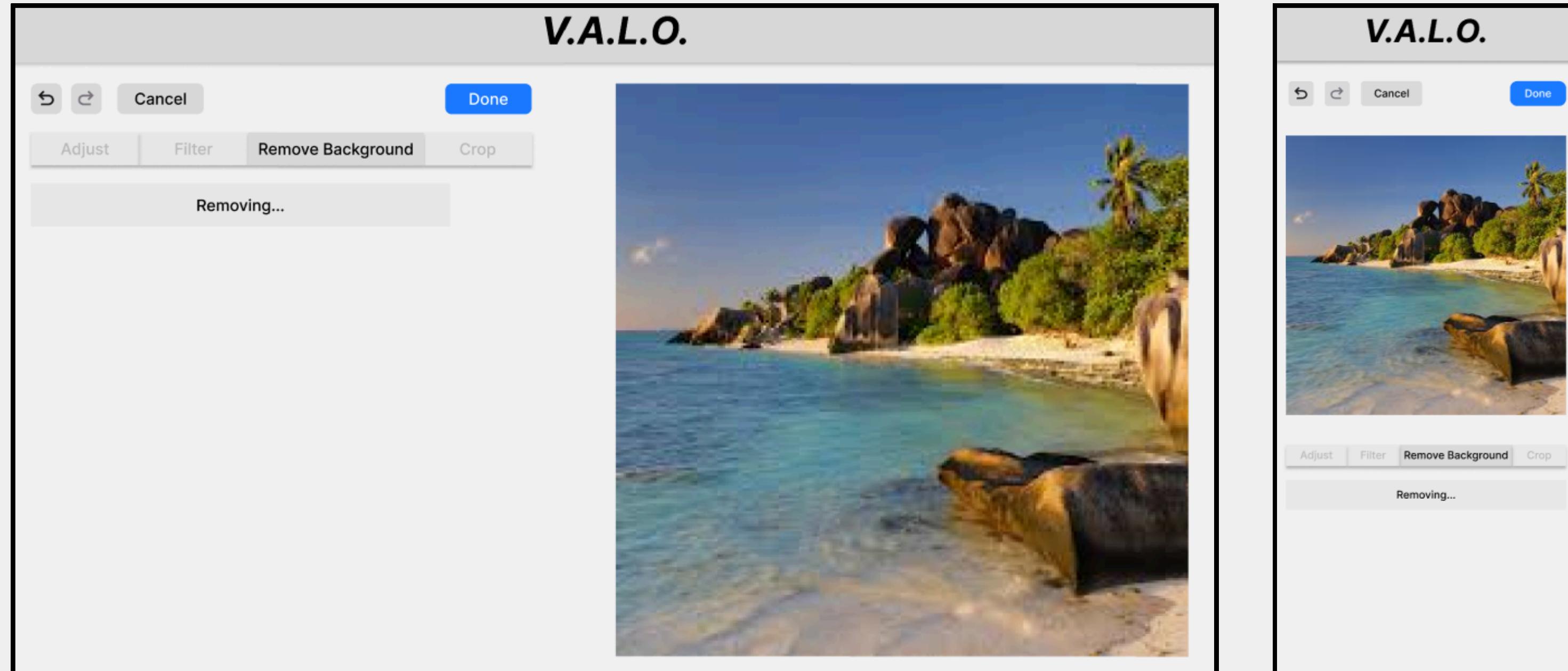
Blue
value 0

[view in Figma](#)



Proposed Interface & Interaction

Background Removal Mode



[view in Figma](#)



Proposed Interface & Interaction

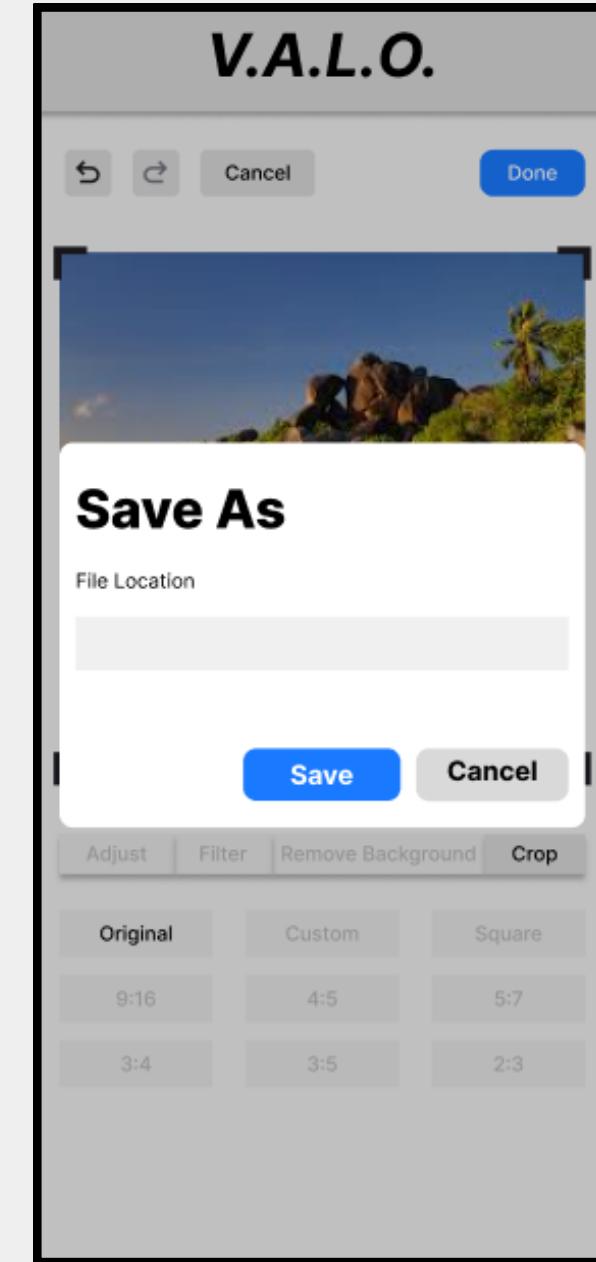
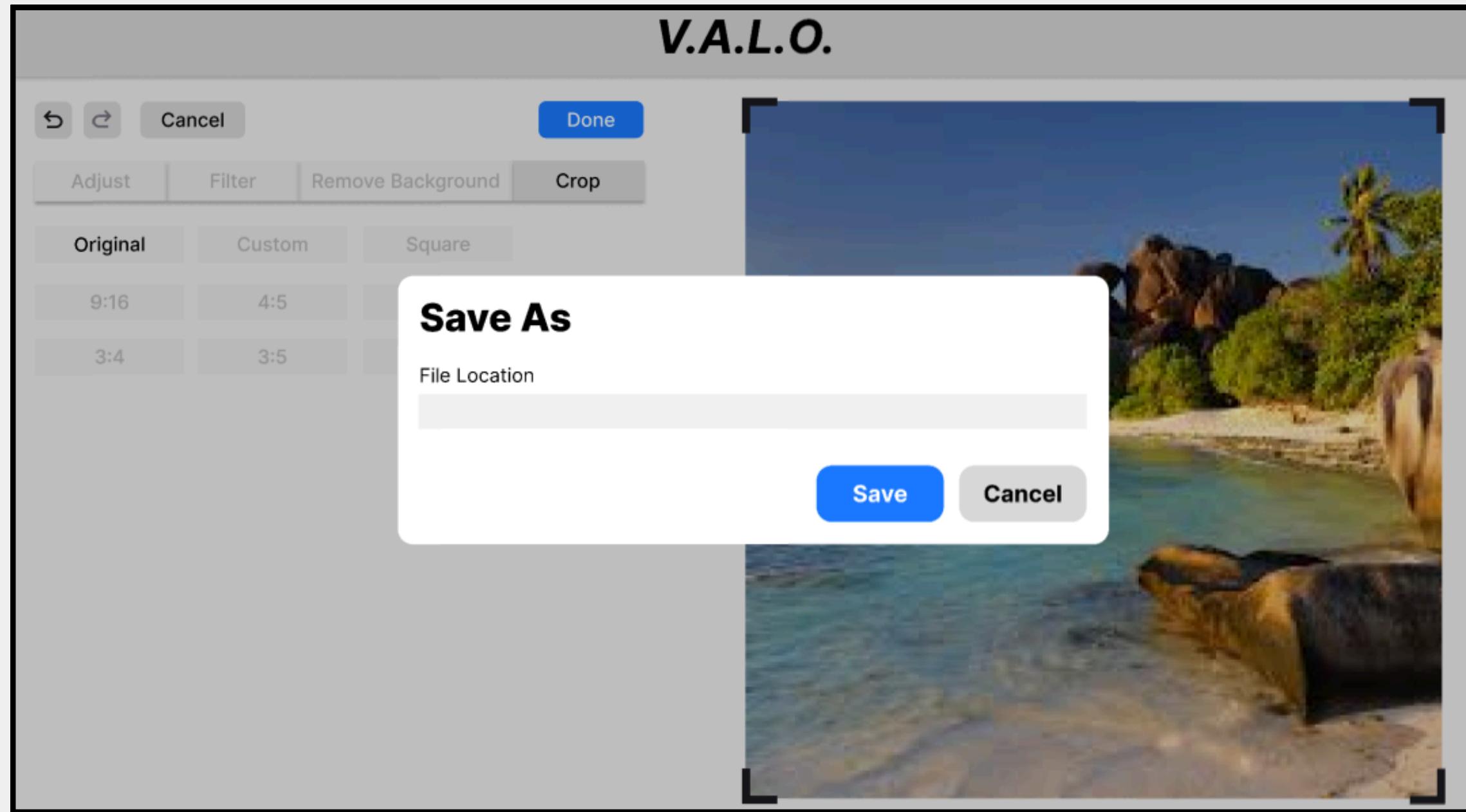
Crop Mode



[view in Figma](#)

Proposed Interface & Interaction

Save Image



[view in Figma](#)



Sample of input and output process

Brightness

input image



output image





Sample of input and output process

Sharpness

input image



output image

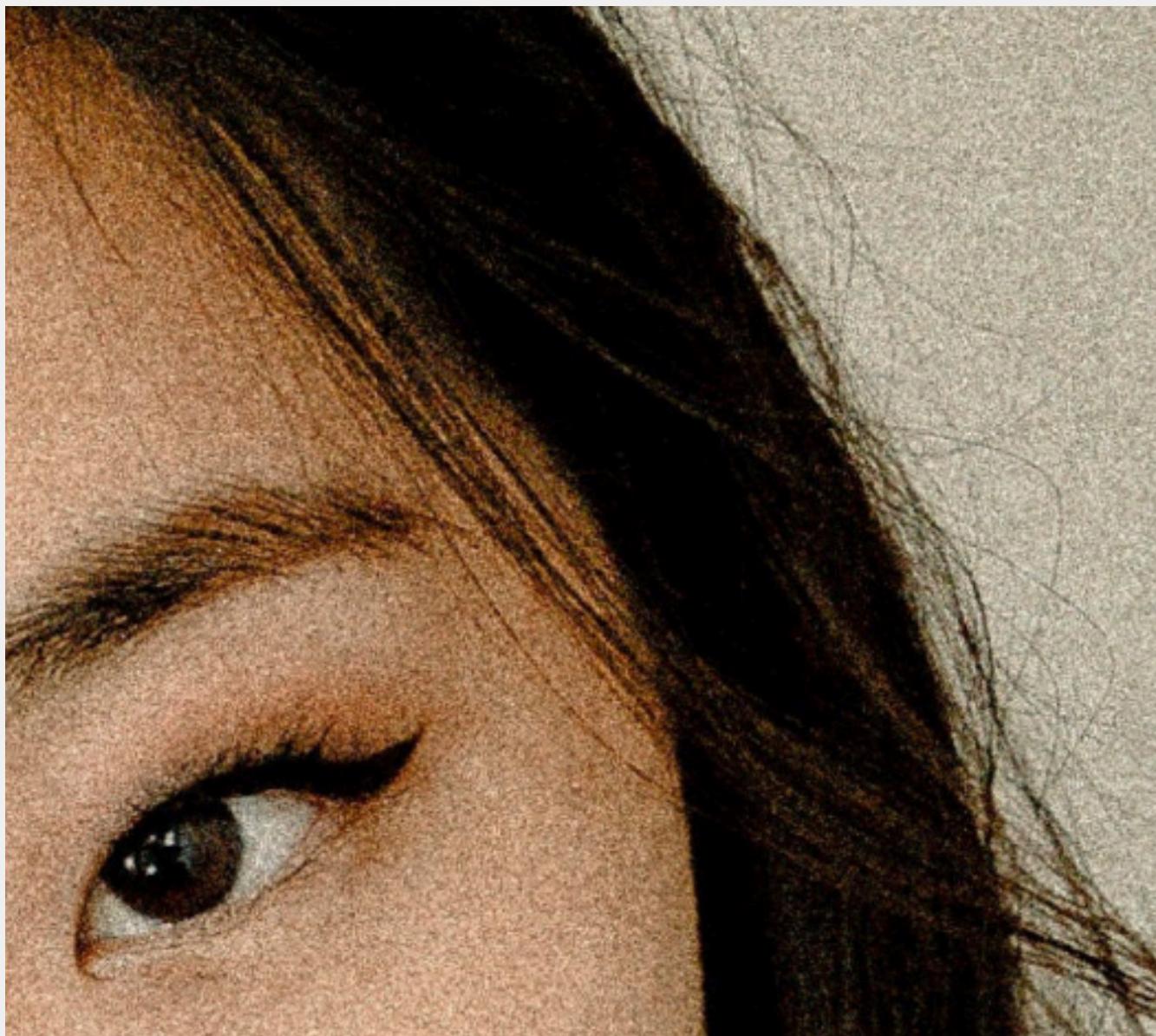




Sample of input and output process

Noise Reduction

input image



output image





Sample of input and output process

Filter

input image



output image





Sample of input and output process

Background Removal

input image



output image





Sample of input and output process

Crop

input image



output image





Conclusion

In conclusion, Visual Adjustment & Layer Operator (V.A.L.O.) successfully demonstrates the use of Python and OpenCV to develop a functional image editing application. The software provides essential image manipulation features through an interactive graphical user interface, allowing users to edit and save images efficiently. This project highlights the practical application of digital image processing techniques in a real-world software system.

