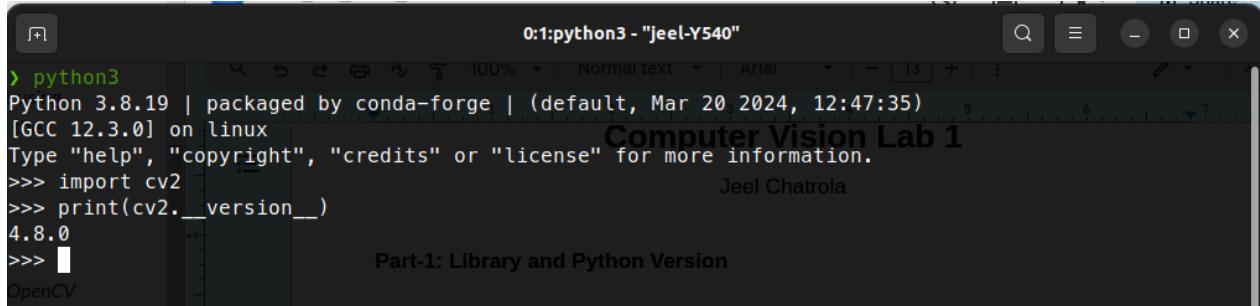


# Computer Vision Lab 1

Jeel Chatrola

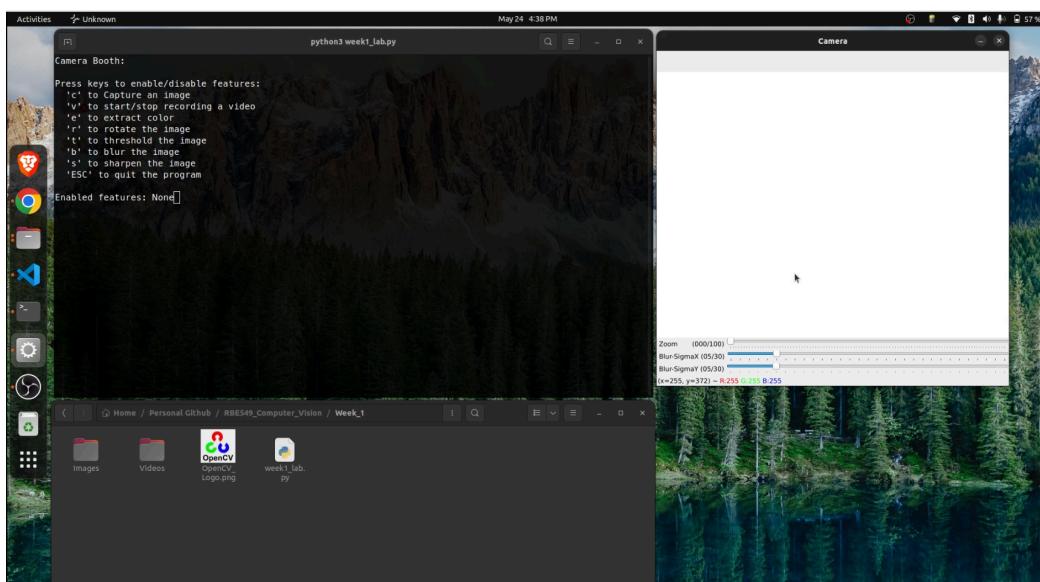
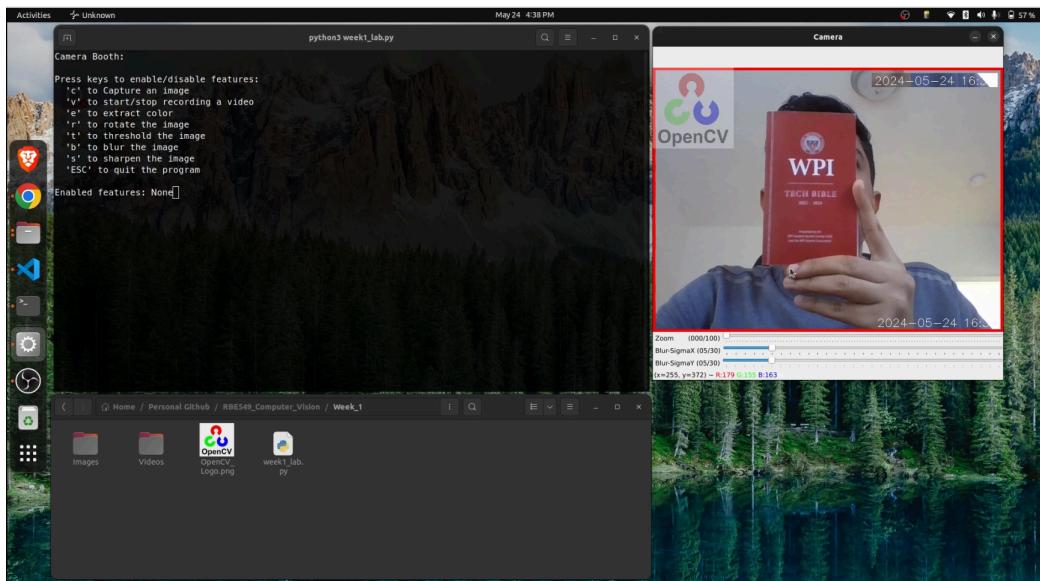
## Part-1: Library and Python Version



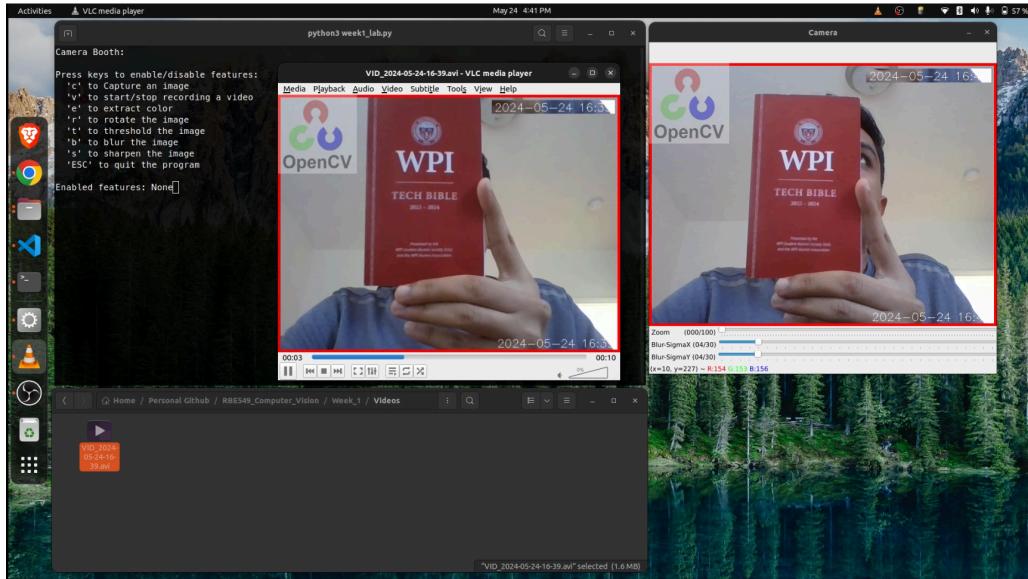
```
0:1:python3 - "jeel-Y540"
> python3
Python 3.8.19 | packaged by conda-forge | (default, Mar 20 2024, 12:47:35)
[GCC 12.3.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import cv2
>>> print(cv2.__version__)
4.8.0
>>> [REDACTED]
Part-1: Library and Python Version
OpenCV
```

## Part-2: PhotoBooth: Capture Photos and Video, Zoom

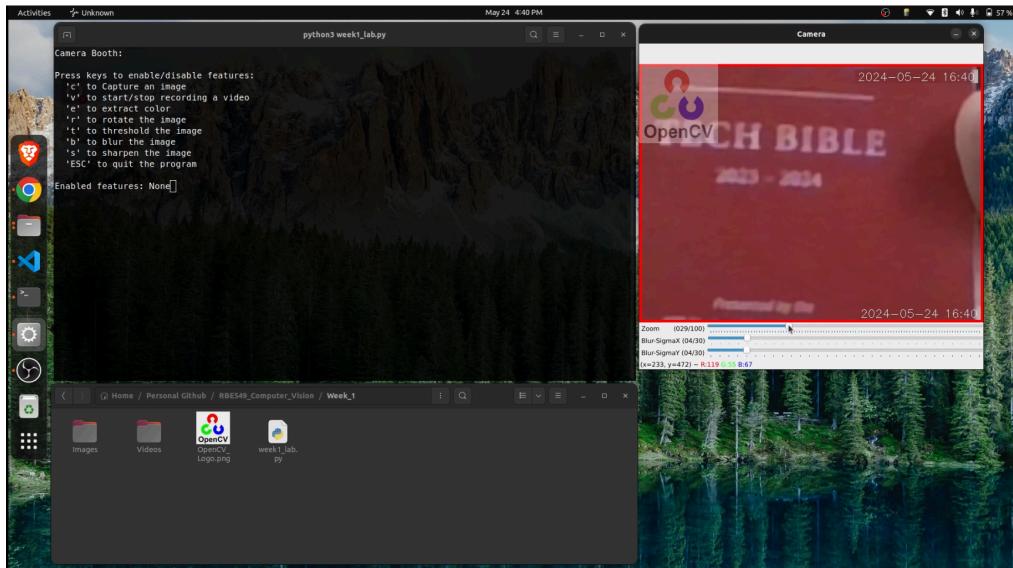
### 1) Photo Capture:



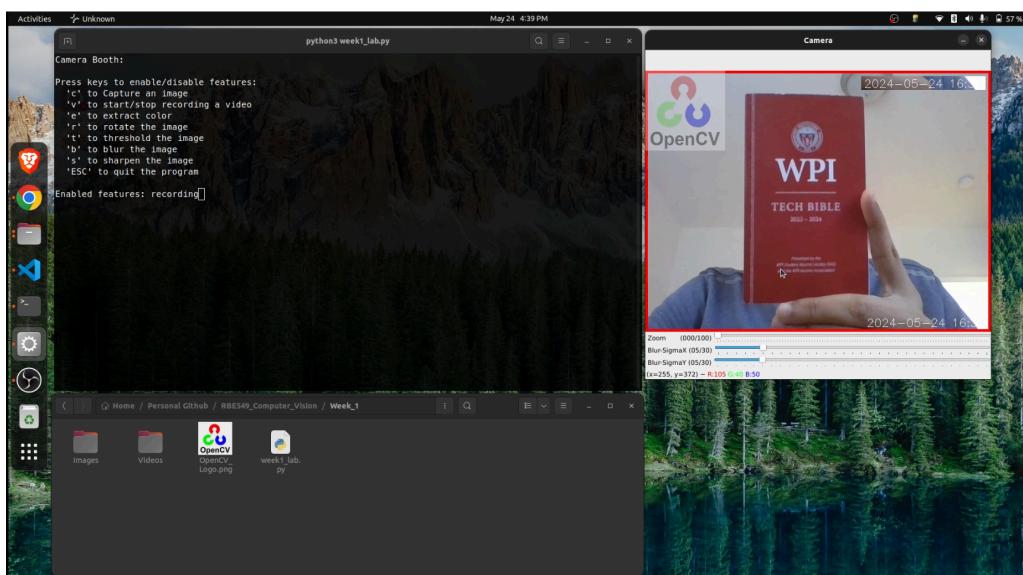
## 2) Video Capture



## 3) Zooming

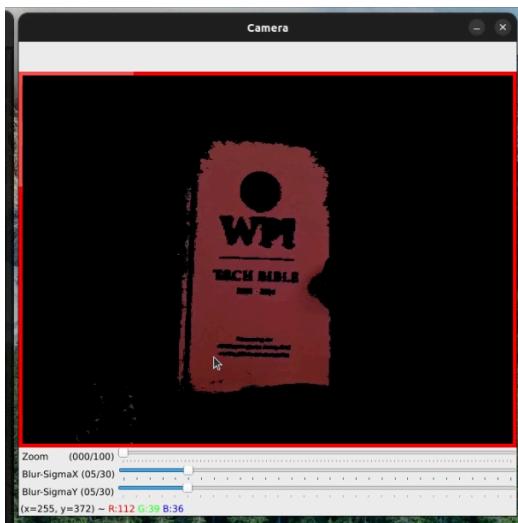


## Part-3: Modifying Video Stream with TimeStamp and OpenCV logo

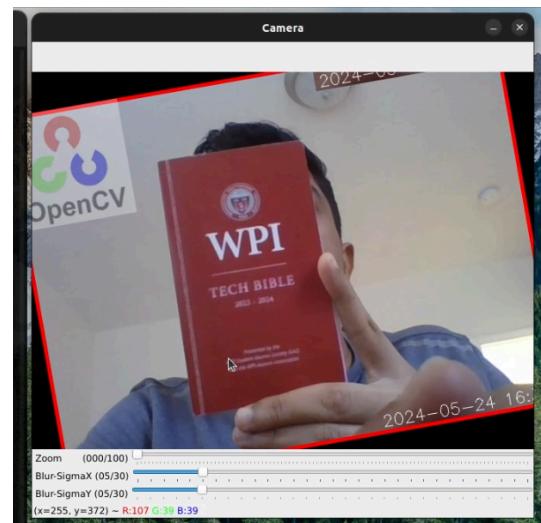


## Part-4: Advanced Filtering and Blurring

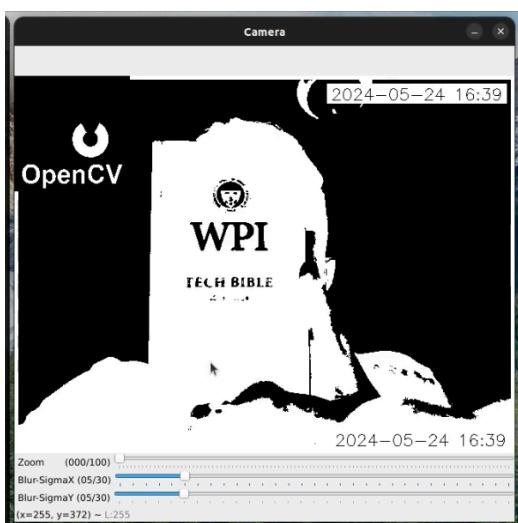
### 1. Color Extraction



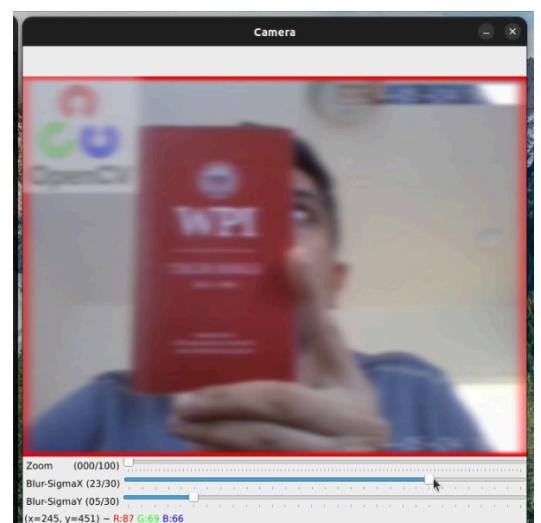
### 2. Image Rotation



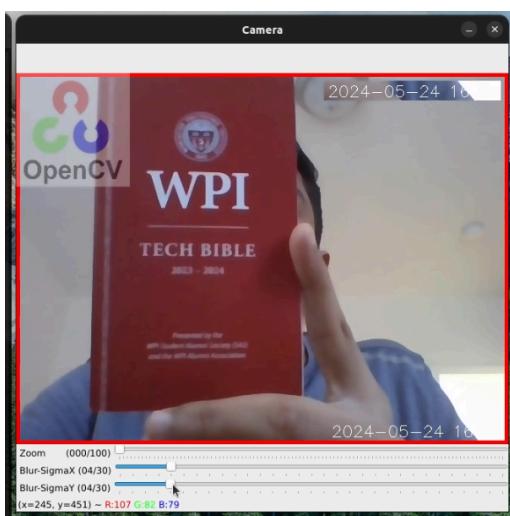
### 3. Thresholding



### 4. Blurring



### 5. Sharpened



This application is a video processor that provides several functionalities for video manipulation. Here are the functions it provides. The application captures video from a specified source, a file, or a webcam device. The application runs in a main loop that keeps the video stream running until the user presses the 'ESC' key. The user can enable or disable each feature by pressing the corresponding key.

- **Image Capture:** The user can capture an image from the video stream by pressing the 'c' key. The captured image is saved with a timestamp.
- **Video Recording:** The user can start and stop video recording by pressing the 'v' key. The recorded video is saved with a timestamp.
- **Color Extraction:** The user can extract a specific color (red) from the video stream by pressing the 'e' key. This is done by converting the frame to HSV color space and applying a mask.
- **Image Rotation:** The user can rotate the image by pressing the 'r' key. The rotation is done around the center of the image by 10 degrees.
- **Image Thresholding:** The user can apply a binary inverse threshold to the image by pressing the 't' key. This converts the image to grayscale, and all pixels with a value greater than 127 are set to 0 and vice versa.
- **Image Blurring:** The user can blur the image by pressing the 'b' key. The amount of blur is controlled by two trackbars for 'Blur-SigmaX' and 'Blur-SigmaY.'
- **Image Sharpening:** The user can sharpen the image by pressing the 's' key. This is done using a bilateral filter.
- **Zoom:** The user can zoom in and out of the video stream. The zoom level is controlled by a trackbar.