
Report on Image Processing and Color Detection Applications

What I Built:

In this project, two Python scripts were developed using OpenCV and pandas. The first script processes a static image (image.jpg). It performs several operations, including loading the image, converting it to grayscale, applying Gaussian blur, and detecting edges using the Canny edge detection algorithm. The results of these operations are saved as new image files.

The second script implements a color detection application using a webcam feed. It captures video frames, allows users to click on any pixel to identify its color, and displays the corresponding color name alongside its RGB values. The color information is sourced from a CSV file containing standard color names and their RGB representations.

Challenges I Faced:

One of the primary challenges was accurately matching the clicked pixel's RGB values to a known color name. This required parsing the dataset properly and ensuring the columns were correctly assigned. Initially, the script failed to display the correct color name because the dataset headers or column indices were misaligned. Another minor challenge was adjusting the text color for readability, depending on the background color's brightness. Integrating the mouse callback and ensuring the application responded only to clicks also needed careful handling.

What I Would Improve If I Had More Time:

If given more time, I would aim to strengthen error handling mechanisms to provide users with clearer feedback when issues arise, ultimately creating a more seamless experience. By prioritizing these improvements, the applications could become more user-friendly and efficient, catering to a wider audience and adapting better to real-world scenarios. Furthermore, I would prioritize improving the documentation and testing processes. Comprehensive documentation would help users better understand how to utilize the applications effectively, while thorough testing would ensure that the code is robust and functions correctly across different scenarios.

However, due to the time constraints imposed by my upcoming final exams starting tomorrow, I had to complete the project in this state.