

# Project 2: Content-Based Image Retrieval

Vinesh Krishna Anne

The project is to manipulate and analyze images at a pixel level. In addition, we will be doing matching, or pattern recognition.

## Task 1: Baseline Matching

The 9x9 square in the middle of the image is taken as a feature vector, read a target image, compute as the feature vector, compare with the other images in the directory using the difference distance metric, sorts the matches, and returns the best matches.

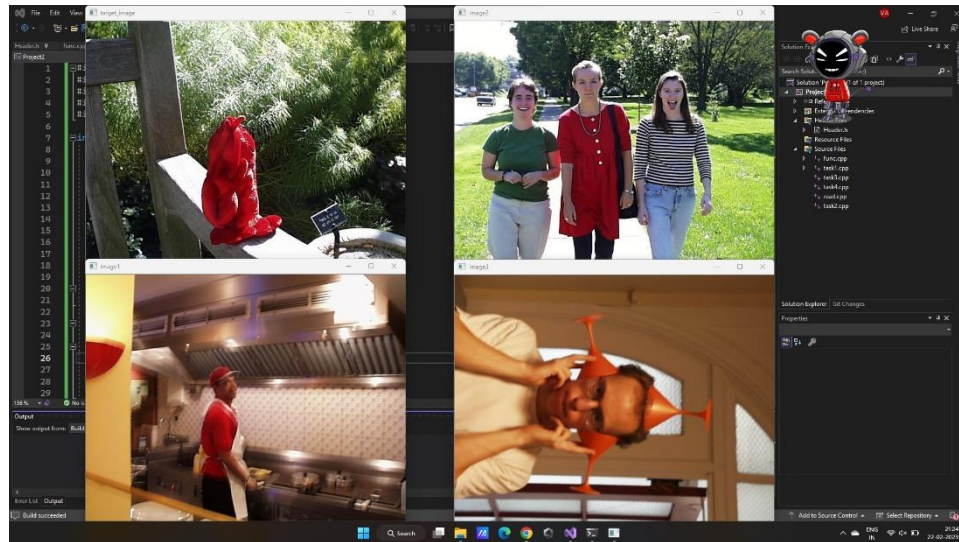


Figure 1: Output of Task1: Baseline Matching

## Task 2: Histogram Matching

This program forms a single normalized color histogram as a feature vector and calculates histograms from the image and computes histogram intersection distance metric for image comparison. And gives out the best matches with the feature vector.

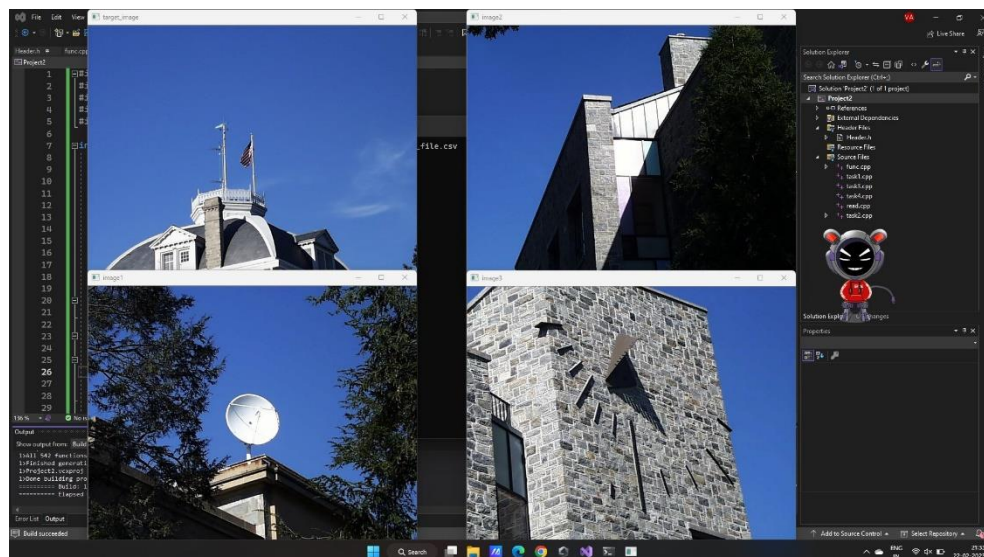


Figure 2: Output of Task2: Histogram Matching

### Task 3: Multi-Histogram Matching

Using two RGB histograms representing the top and bottom halves of the image with histogram intersection as the distance metric, the top three matches with the target image are found.

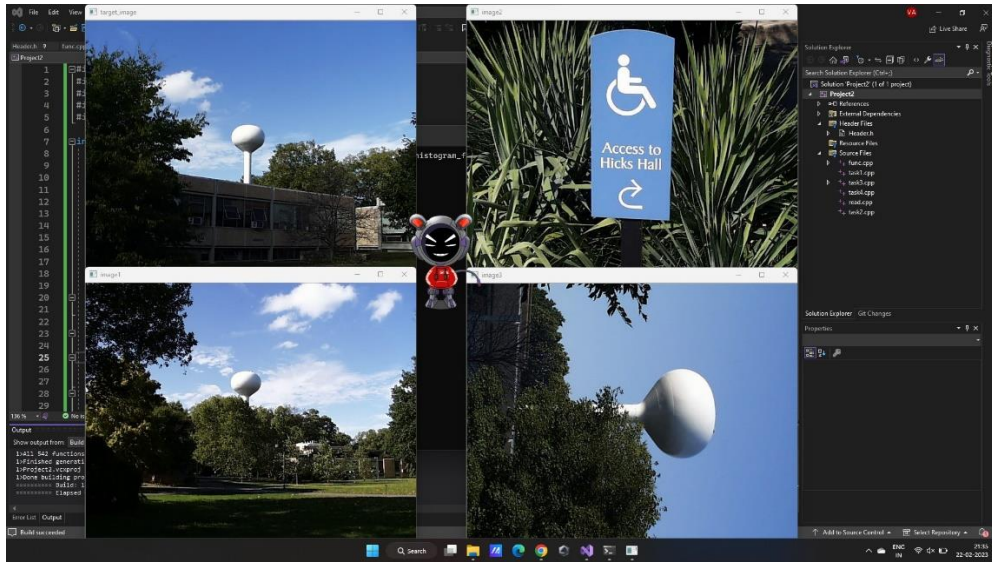


Figure 3: Output of Task3: Multi-histogram Matching

### Task 4: Texture and Color

A whole texture histogram and color histogram are used as feature vector using the Sobel filter. Compares with the feature vector of the target image and gives the best match.

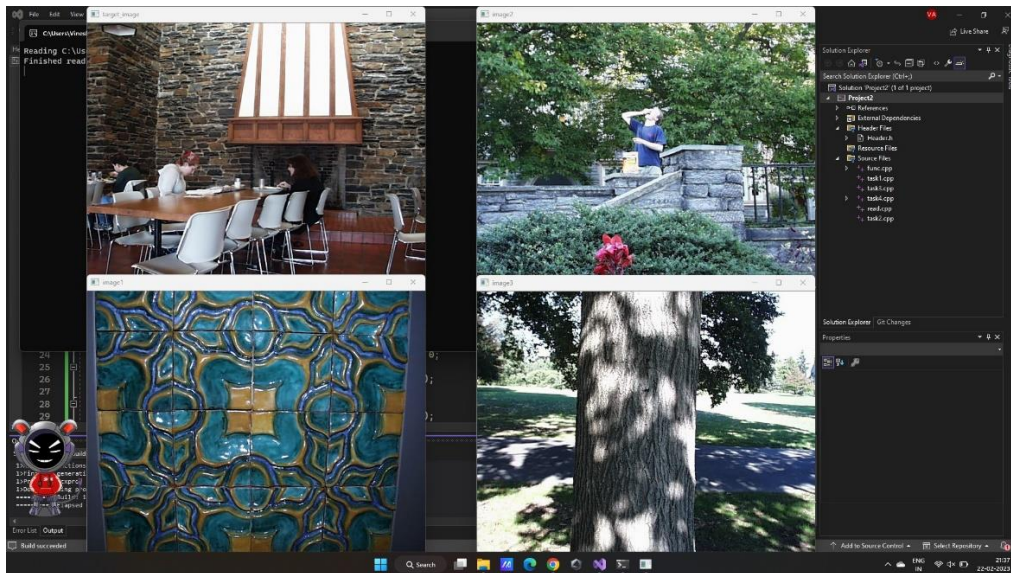


Figure 4: Output of Task4: Texture and Color

### Acknowledgment:

I express my sincere thanks and gratitude to Prof. Bruce Maxwell for giving me this opportunity. The success and outcome of this project required a lot of guidance and assistance that I received from the professor and friends with the completion of my project.