



**Ahmedabad
University**

ECE501- Digital Image Processing Weekly Report 6

Section 1

Submitted to faculty: Prof. Mehul Raval

Topic: Content-Based Image Retrieval (CBIR)

Week Duration: 2nd Nov - 8th Nov

Group no.: 6

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2025-2026 (Monsoon Semester)

Objective

To design a Content-Based Image Retrieval (CBIR) system capable of retrieving visually similar images from a custom dataset using classical Digital Image Processing techniques such as colour histograms, texture analysis and edge detection, test and verify the results on images from the collected dataset, and retrieve meaningful data.

Input: a query image and a dataset

Output: a set of images from the dataset with a rank which are visually similar to the input image.

Work Done This Week

- We grouped the three selected domains dataset into one, consisting a total of 530 images.
- Furthermore, we pre-processed them so that feature extraction can be implemented and similar images can be obtained from the query image.
- The methods we have used for image retrieval using features are HSV and LAB Histograms (LAB - a colour space) for colour, LBP (Local Binary Pattern) for texture and Hu Moments for shape.
- While verifying the coding implementation, we received fair results for 11 query images out of 20.

Here are a few results obtained:

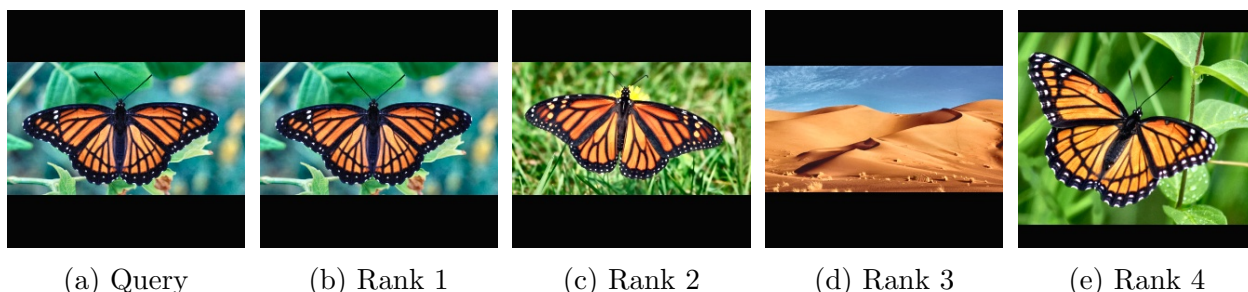


Figure 1

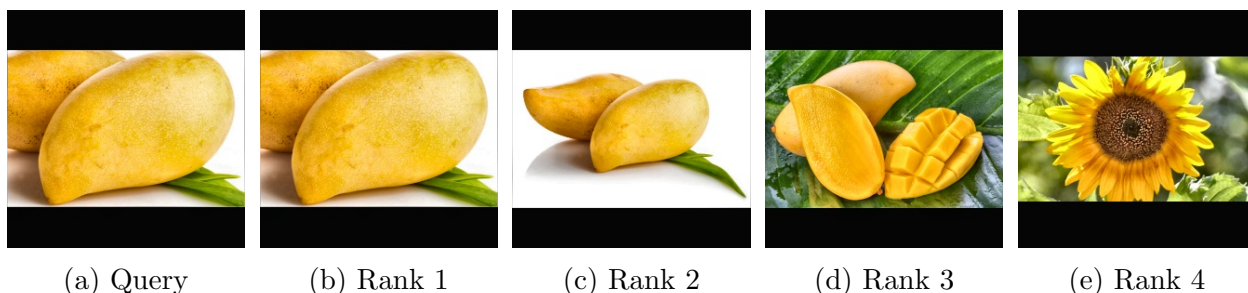


Figure 2

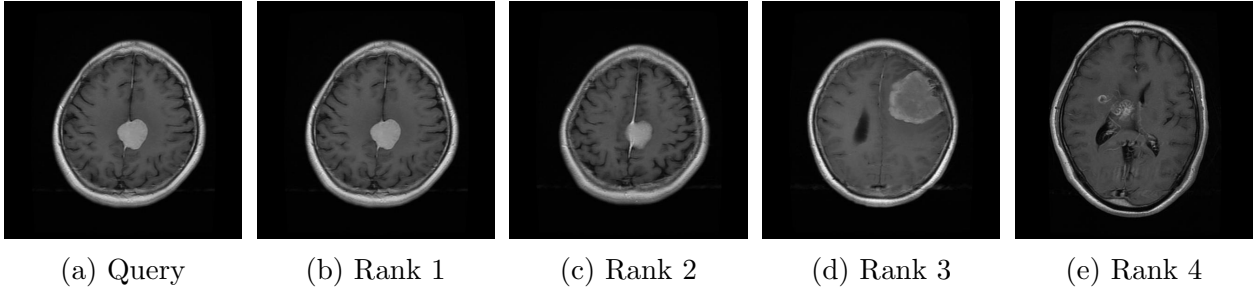


Figure 3

Query	Domain	Precision	Recall	F1_Score	Accuracy
nature_Butterfly	Natural	1	0.0357	0.069	0.7453
nature_q_Mango_29	Natural	1	0.0357	0.069	0.7453
brainMRI_q_0055	brainMRI	1	0.0167	0.0328	0.4434

Table 1: Performance Metrics for Different Query Domains

Next Week Plan

- We plan to work on improving the results of those query images whose resulting images were not appropriate.
- We will check our code implementation for the paintings, which is yet to be done.
- We plan to complete our final project report, make a presentation for the final evaluation.

Challenges Faced

- Pre-processing was difficult and time-consuming due to the varied dataset and its integration.
We later added padding to get better pre-processed images.
- A few query images gave irrelevant results that must be worked upon for appropriate results.