Ahmedabad University

ECE501- Digital Image Processing

Weekly Report 3

Section 1

Submitted to faculty: Prof. Mehul Raval

Topic: Content-Based Image Retrieval (CBIR)

Week Duration: 12th Oct - 18th Oct

Group no.: 6

Enrollment No.	Name	Name of the Program
AU2340030	Dhriti Gandhi	Btech: Computer Science And Engineering
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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

- Implemented the code for texture-based feature extraction using Local Binary Pattern (LBP) for our Content-Based Image Retrieval system.
- We participated in the Kaggle competition on Face Recognition, which was aimed to be built using classical approaches only and without deep learning.
- For this, we used feature extraction techniques like LBP, Histogram of Oriented Gradients (HOG) and Canny Edge Detection. Later, for verification and classification of the extracted features across various conditions(with/without specs, with/without cap, smile), we used Linear Support Vector Machine (Linear SVM).
- The competition gave us insights into how edge and texture-based descriptors work under real-world applications – that was directly related to our project.
- We also discussed combining LBP and HOG into the texture feature extraction of our CBIR system.

Next Week Plan

- Trying out more different features and get the best output.
- Finalizing the domain in which we will concentrate our final output. May even stretch to the upcoming week.
- Finding the dataset for the selected domain and determining the features for the same.

Challenges Faced

- Substantial amount of time to compile and run the program makes it difficult for us to reach the weekly goal.
- We couldn't make much progress on the CBIR system, due to our complete involvement in the Kaggle competition. Though its insights will be helpful further.