

# CS 512: Project Proposal

Charu Saxena

Vishal kumar Bimal

A20378393

A20380261

Department of Computer Science

Illinois Institute of Technology

## **Title: Content- Based Image Retrieval**

### Introduction:

This project is about, Content-based Image Retrieval(CBIR) , which aims in designing a system which can retrieve best matches for a queried image. The interest in CBIR has grown because of the limitations in metadata-based systems, as well as the large range of possible uses for efficient image retrieval. We can get textual information about images using tags and other existing technology, but this work involves manually describe each image in the database, which is tiring[1]. The efficiency of a CBIR depends largely on the features extracted from images to be used for matching purpose.

### Problem Statement:

In recent times, most of the data is coming in the form of images more than text and the size of the image are relatively more(a picture worth 60,000 words!), thus storage and transmission of a large number of images has become troublesome. Instead of text retrieval, image retrieval is wildly required in recent decades. Content-based image retrieval (CBIR) is regarded as one of the most effective ways of accessing visual data [2]. It deals with the image content itself such as color and texture structure instead of tags or annotated text. Huge amounts of data retrieval challenge the traditional database technology, but the traditional text-object database cannot satisfy the requirements of an image database.

### Requirements:

The project will be done using python 3.6 and opencv libraries. The image dataset is selected from here[3]. These images will be stored in Image database having image information and feature vector, where the query will be made and resultant images will be retrieved.

**Data Used: Content-based image retrieval database**-containing sets of color images for testing algorithms for content-based retrieval. Most sets have a description file with names of objects in each image. (Formats: jpg)

**Paper link: Content-based image retrieval using color and texture fused features**

[https://ac.els-cdn.com/S0895717710005352/1-s2.0-S0895717710005352-main.pdf?\\_tid=687db446-ba76-11e7-9290-00000aacb362&acdnat=1509040518\\_23e1195c95f4fc6dddcf5687dfaebb\\_a2](https://ac.els-cdn.com/S0895717710005352/1-s2.0-S0895717710005352-main.pdf?_tid=687db446-ba76-11e7-9290-00000aacb362&acdnat=1509040518_23e1195c95f4fc6dddcf5687dfaebb_a2)

## Proposed Solution:

In this project, we referred [2], which presented a novel method to extract color and texture features of an image quickly for content-based image retrieval (CBIR). First, HSV color space is quantified rationally for all the images. Then a color histogram and texture features based are extracted to form feature vectors for all the images which are later used for matching purpose.

Following are the various stages involved in the deployment:

Stage1: Feature extraction

- a) Color Feature Extraction- in hsv color space, color histograms are made for all the parts of the image.
- b) Texture Feature Extraction

Which are stored in database too.

Stage2: Image query

The features for the query image are also extracted.

Stage3: Feature matching

The query feature is matched with every image feature present in the image feature database and the list is sorted to produce a top list of images in the order of most matched to least.

## Responsibilities:

Charu will be responsible for taking the images from database and will be doing the color feature extraction for all the images in the database. Whereas, Vishal will be responsible for doing texture feature extraction for the images and fusing both the feature extractions as a feature vector and put it in the database. Next thing will be retrieving the result from the database on the basis of feature matching which will be done by Charu.

## Reference:

1. [https://en.wikipedia.org/wiki/Content-based\\_image\\_retrieval](https://en.wikipedia.org/wiki/Content-based_image_retrieval)

2. Paper link:

[https://ac.els-cdn.com/S0895717710005352/1-s2.0-S0895717710005352-main.pdf?\\_tid=687db446-ba76-11e7-9290-00000aacb362&acdnat=1509040518\\_23e1195c95f4fc6dddcf5687dfaebb\\_a2](https://ac.els-cdn.com/S0895717710005352/1-s2.0-S0895717710005352-main.pdf?_tid=687db446-ba76-11e7-9290-00000aacb362&acdnat=1509040518_23e1195c95f4fc6dddcf5687dfaebb_a2)

3. Data link: <http://imagedatabase.cs.washington.edu/groundtruth/>