VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

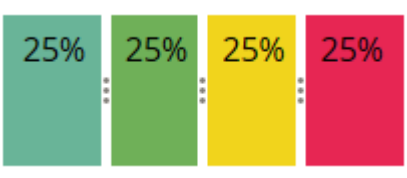
CSE3018 CONTENT BASED IMAGE AND VIDEO RETRIEVAL LAB
FINAL ASSESSMENT TEST

DATE:08.12.2021

1. Implement a CBIR system that performs MultiColor Search Engine.

   Hint:

   1. Database contains lot of multicolour images.
   2. Input is not a query image. Rather, obtain what are the colors to be present in the image and in what percentage: For eg.,



   3. The search result will be like:

Measure the Precision and Recall of the system

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2. Implement a CBIR system for RGB images that uses the following features -- HSV statistical features:
    a. HSV Color Moment features like Mean Hue, Mean Saturation, Mean Intensity, Median Hue, Median Saturation, Median Intensity, Standard deviation Hue, Standard deviation Saturation and Standard deviation Intensity, Variance Hue, Variance Saturation, Variance Intensity, Skewness Hue, Skewness Saturation, Skewness Intensity, Kurtosis Hue, Kurtosis Saturation and Kurotsis Intensity are calculated from HSV Color Moments.
    b. Square energy and mean amplitude of HSV values

    Totally 18 features, from all color planes(HSV).

    Database – 50 images from 2 categories
    Query Image – 1
    Search Result – 10 images
    Distance Metric – Manhattan distance

    Measure the Precision and Recall of the system

3. Implement a CBIR system for RGB images that uses the following features -- **Log-Histogram (LH)** Features:

    Hint : -- **Log-Histogram (LH)**features :

    a. Resize the image to 128 ×128 and divides the image into R, G and B components.
    b. Apply log operator on each component of the image.
    c. Compute the histogram of log components of query image as well as images in the database.
    d. Then Histogram Distance (HD) is used to compute the similarity measure between query image and images from the database.

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$$HD(q,t)= \sum_{i=1}^{M} abs(h_q(i)-h_t(i)) \quad \text{---- (1)}$$

Database – 50 images from 2 categories

Query Image – 1

Search Result – 10 images

Distance Metric – Canberra distance

$$\Delta d = \sum_{i=1}^{n} \frac{|Q_i - D_i|}{|Q_i| + |D_i|}$$

Measure the Precision and Recall of the system

4. Deploy this CBIR and perform the following:
   https://drive.google.com/drive/folders/1EZy-ZJL9yOPySmGSt5AZIb2dzdqwfgy8?usp=sharing
   a. List down the set of features that could be chosen for getting a Precision above 0.8 and recall above 0.8 at lowest time.
   b. Find out the query image that will take the fastest response time.
   c. Evaluate the system with individual feature set and tabulate your results for 2 query images from each category.
   d. Introduce a new category of your own and integrate with this model. Show the response of the system on these new category of images.
   e. Rank the various features based on their effectiveness.

5. Implement a Pedestrian Detection system using HOG features.

Database – 50 images from 2 categories

Query Image – 1

Search Result – 10 images

Distance Metric – Your choice

Measure the Precision and Recall of the system

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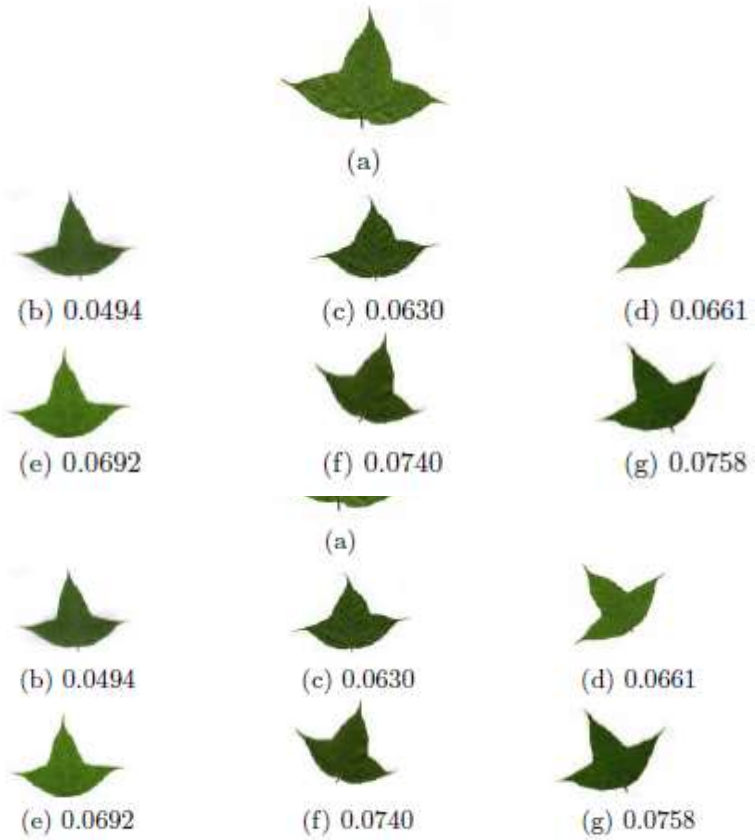
6. Implement a leaf image retrieval system that uses features derived shape features.

Eg.



Database – 20 images for 2 leaf categories

Query Image – 1

Search Result – 10 images

Distance Metric – Canberra distance

$$\Delta d = \sum_{i=1}^{n} \frac{|Q_i - D_i|}{|Q_i| + |D_i|}$$

Measure the Precision and Recall of the system