

CSE 515 Multimedia and Web Databases

Phase #2

(Due October 23rd, 2016, midnight)

Description: In this project, you will experiment with

- video retrieval.

This project will build on the deliverables of the previous phase. Consider the data that was provided to you in the previous phase.

- **Task 1: Video Similarity:** For this task, let us assume that *in_file.chst*, *in_file.sift*, and *in_file.mvect* files are already created for a given set of video files and parameter settings.
 - **Task 1a-b:** Implement a program which, given two video files, v_i and v_j in the directory, computes the color histogram similarity between them (using at least two different methods) and outputs the results.
 - **Task 1c-d:** Implement a program which, given two video files, v_i and v_j in the directory, computes the SIFT similarity between them (using at least two different methods) and outputs the results.
 - **Task 1d-e:** Implement a program which, given two video files, v_i and v_j in the directory, computes the motion similarity between them (using at least two different methods) and outputs the results.
 - **Task 1f-g:** Implement a program which, given two video files, v_i and v_j in the directory, computes the overall similarity between them (using at least two different methods) and outputs the results.
- **Task 2: Video sub-sequence search:** For this task, let us assume that *in_file.chst*, *in_file.sift*, and *in_file.mvect* files are already created for a given set of video files and parameter settings.
 - **Task 2a-g:** Implement a program which, given a video file, v_i , in the directory, a frame range, $[a, b]$, an integer, k , and one of the eight methods in Task 1, returns the k most similar frame sequences and visualizes the query and results as videos.
- **Task 3: Video dimensionality reduction:** For this task, let us assume that *in_file.chst*, *in_file.sift*, and *in_file.mvect* files are already created for a given set of video files and parameter settings.
 - **Task 3a-c:** Implement a program which, given an input database *in_file.chst*, *in_file.sift*, or *in_file.mvect* and a target dimensionality, d , creates an output database, *out_file.d.c pca*, *in_file.d.s pca*, or *in_file.d.m pca*, respectively, with dimensionality, d , using PCA.
The program also reports the d dimensions in terms of the input vector space.
 - **Task 3d-f:** Implement a program which, given an input database *in_file.chst*, *in_file.sift*, or *in_file.mvect* and a target dimensionality, d , creates an output database, *out_file.d.ckm*, *in_file.d.s km*, or *in_file.d.m km*, respectively, with dimensionality, d , using k -means clustering.
The program also reports the d dimensions in terms of the input vector space.

You can use Matlab packages for PCA and k-means. The selected d dimensions are to be reported in the form of $\langle original_index, score \rangle$ in non-increasing order of scores.

- **Task 4: Video sub-sequence search in reduced vector space:**

- **Task 4a-g:** Implement a program which, given a video file, v_i , in the directory, a frame range, $[a, b]$, an integer, k , and one of the eight methods in Task 1, returns the k most similar frame sequences using the dimensionality reduced vector space and visualizes the query and results as videos.

Deliverables:

- Your code (properly commented) and a README file.
- Your outputs for the provided sample inputs.
- A report describing your work and the results.

Please place your code in a directory titled “Code”, the outputs to a directory called “Outputs”, and your report in a directory called “Report”; zip or tar all off them together and submit it through the digital dropbox.