

# CSE 408/598 Multimedia Information Systems

## Phase #1

(Due Sept 20th 2015, midnight)

**Description:** In this project, you will

- experiment with video processing libraries and
- experiment with color models.

### Tasks:

1. Download the sample video data set from the project directory.
2. Download the relevant “OpenCV” libraries from

*<http://opencv.org>*

You are not required to use OpenCV’s libraries. This is only provided as a conveniently available alternative.

3. Implement a program which, given
  - one of the color spaces, RGB, XYZ, Lab, YUV, YCbCr, YIQ, or HSL (using the color models described in the book and/or notes),
  - three color instances,  $ci_{\perp}$ ,  $ci_0$  and  $ci_{\top}$ , in the chosen color space, and
  - number of bits,  $b$ ,

creates a color map (with  $2^b$  color instances) which maps each value in range -1.0 to 1.0 to a color instance in the chosen color space such that the value -1.0 maps to the color instance,  $ci_{\perp}$ , 0.0 maps to the color instance,  $ci_0$ , and 1.0 maps to the color instance,  $ci_{\top}$  (the mapping function should be continuous). The program should output the resulting color map into an ASCII text file as well as display it by visually painting the colors in the color map.

4. Implement a second program which lets the user select
  - a video file,  $v$ , in the database,
  - a frame rate,  $r$ ,
  - two frames,  $f_1$  and  $f_2$ , and
  - a color map file

and, given these,

- extracts and displays 8-bit gray scale contents,  $g_1$  and  $g_2$ , of frames,  $f_1$  and  $f_2$ ,
- computes a difference image,  $\Delta$ , of gray scale images,  $g_1$  and  $g_2$ ,

- rescales the values in the difference image to a range between -1.0 and 1.0 (such that -1.0 corresponds to -255 and 1.0 corresponds to 255), and
- visualizes the difference image  $\Delta$  using the selected color map.

**Deliverables:**

- Your code (properly commented) and a README file.
- A report describing your work and the results on samples to be provided.

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