**CSC8820**

**Advanced Graphics Algorithms**

Spring 2018

**Project 4**

Due date: 11:59 pm **04/27/2018**

Requirements

In this project you will learn how to write an OpenCL program for simple image processing.

Requirements:

1. Your program should read a color image, convert it to a grayscale image, and save the grayscale image to a file.
   1. The algorithms for converting color to grayscale can be found [here](http://www.johndcook.com/blog/2009/08/24/algorithms-convert-color-grayscale/) or [here](http://www.tannerhelland.com/3643/grayscale-image-algorithm-vb6/).
   2. You must use one of the two image loading libraries: [CImg](https://github.com/dtschump/CImg) or [FreeImage](http://freeimage.sourceforge.net/). This will make it easier for my TA and me to build your program.
2. Implement both a parallel version of this algorithm in C/C++ and OpenCL, and also a sequential version in C or C++.
   1. Compare the performance of the parallel version and the sequential version. Is the parallel version faster than the sequential version?
   2. Vary the number of work items. Does it make a difference in performance (i.e. time)?
   3. Compare the performance of the parallel version of your algorithm on CPU and GPU. Which one is faster?
   4. Include a brief report to describe your experiments and results.
3. Upload your source code and report in a ZIP file to iCollege under the folder Project 4. Do not submit via email.