ELE 491 GUI Based Image Processing Algorithms
## Summer Session I, May 21 – June 20, 2007
Mondays and Wednesdays, 6-9:45PM
URI Kingston Campus, Kelley Hall 203
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Virtually every modern operation system (Windows XP®, Mac OS®, Linux®, etc.) uses windows that allow the user to use mouse and keyboard inputs to manipulate the window. This is also true for most professional software packages. Additionally, the up swell of digital photography in the past several years has led to the creation of a vast array of digital photographic enhancement software. In this course, you will learn the algorithms needed to perform a number of standard image processing techniques and how to create a window environment to display the results.

The course will cover filtering techniques, edge detection and enhancement, black and white (grayscale) as well as color image processing, and segmentation techniques. You will develop high pass, low pass, median, and morphological filters in addition to interactive operations such as identifying and highlighting areas of interest in the image. The images will then be displayed using wxWidgets, a powerful cross-platform graphic user interface (GUI) toolkit that can be compiled and run on Windows®, Mac®, and UNIX® systems. wxWidgets is freeware and utilizes the C++ programming language. Since C++ is an object oriented language, you will learn the basic syntax and command structure of the language and understand the significance of object oriented programming. By the end of the course, you will have a free standing software package that will perform many of the same image processing functions of your favorite editing tool. More importantly, you'll know how they work!
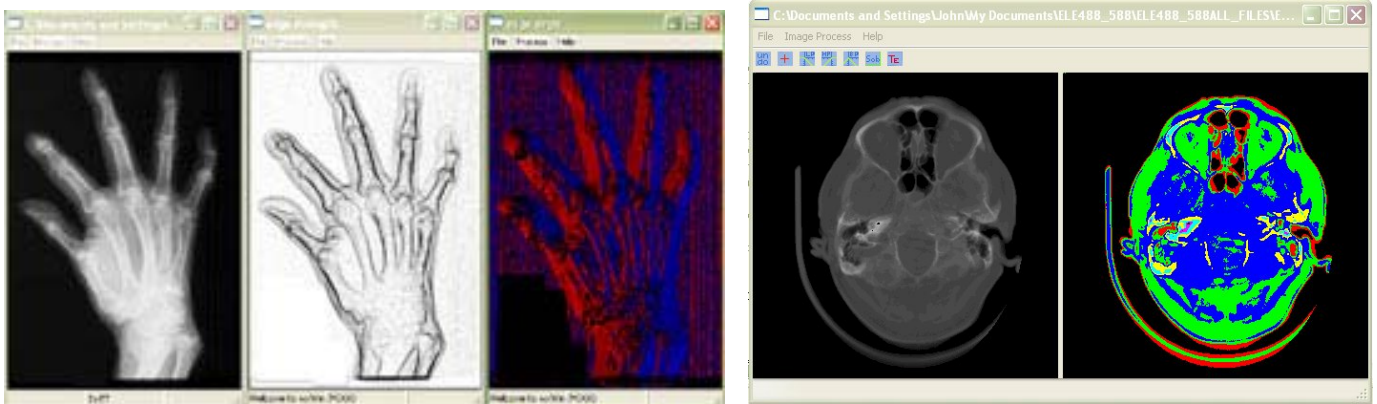
The figures above are screen shots of the results you will be able to reproduce by the end of this course. The left image is an X-ray of a hand with edge strength and phase information being displayed in new windows. The right image is a split screen of a cranial CT Scan that has been converted from grayscale to a colormap. This is a common technique in image processing that reveals information that is difficult to see in shades of gray.