White Paper:

Preprocessing of Satellite Imagery

Author: Joshua Abraham

Class: EECS 4422

Professor: Calden Wloka

Lassonde School of Engineering, York University

Problem Definition

The project proposed is for the scientific stream. Preprocessing of satellite imagery could be used to greatly enhance the effectiveness of various computer vision algorithms. Currently there are many issues with satellite imaging in terms of image quality due to lower resolutions and noise within images. This could result in lower performing computer vision algorithms, specifically edge detection which will be the focus within the project. The project will be using the *19-class Satellite Scene Dataset* for images. First, edge detection analyses will be run on various images that have had no image preprocessing done to them, followed by some quantitative analysis of the edge detected image. After this, using the same set of images, various preprocessing techniques will be used either individually or in combinations to produce various new sets of images. Some of the techniques that will be used include contrast enhancements, brightness adjustment, image sharpening, and smoothing functions to reduce external noise. These new sets will also run through the same edge detection algorithm and be judged quantitatively. Once this is done, the various data points will be compared to determine which types of preprocessing lead to the best edge detection. This project may also demonstrate that for certain subsets of images that have common properties specific techniques may produce better outcomes which are not consistent amongst all images within a set.