Assignment A1: Error Estimates

CS 6320
Spring 2014

Assigned: 6 January 2014

Due: 15 January 2014

For this problem, handin a lab report pdf (include name, date, assignment and class number in pdf) which studies noise estimation in intensity images. You should handin the report pdf as well as the Matlab code used in the study. The code should conform to the style requested in the class materials.

In addition, please turn in a hardcopy of the report in class before the start of class on Jan 15, 2014.

1. Develop Matlab functions to estimate the mean and standard deviation of noise in a set of images. Note that this is a pixel-wise operation given a set of images of the same scene. Validate the code on a set of images with known noise properties.

2. Study the question of whether the image noise is Gaussian for the image set in the class data/noise directory (file is waves_set.mat). Write a lab report in the format (please do not deviate from this format!) described in the course materials.

Discuss the statistical framework to establish a confidence interval on the means, and the hypothesis test.

The function specification is:

```
function [mu,sigma] = CS6320_noise_estimates(image_set)
%
% CS6320_noise_estimate - determine noise properties of a set of images
% On input:
%     image_set (mxnxp array): p mxn images of the same scene
% On output:
%     mu (mxn array): mean at each pixel
%     sigma (mxn array): standard deviation at each pixel
% Call:
%     [mu1,sigma1] = CS6320_noise_estimate(scene1);
% Author:
%     <Your name>
%     UU
%     Spring 2014
%
```