

## Homework 1

### Integrating a noisy signal (Due: 3/20)

1. Matlab simulations
  - Create 100 different sets of random signals, each set has 1000 points, zero mean, and a standard deviation of 2.
  - Assuming the sampling time of each signal is 1 ms, Integrate each set of the signal for 1 second.
  - Plot the mean value and standard deviation of the above 100 signals as a function of time.
  - Do a curve fitting for "standard deviation =  $c_1 t^{c_2}$ ", and find the parameter  $c_2$ .  
(Hint:  $\log(\text{standard deviation}) = \log(c_1) + c_2 \log(t)$ , and then using the least square method.)
  - Useful Matlab functions: randn, std, mean, plot, etc.
2. Turn in your Matlab files with plots and simulation codes.