

1. Write a MATLAB function to implement the Kalman filter equations. Each call to the function should represent a single time step.
2. Write a MATLAB code to estimate, using Kalman filter, the value of a random constant whose measurements are in the hw6_prob2.dat. The standard deviation of the measurements noise is 1.
 - (a) Write your state equation
 - (b) Write your measurement equation
 - (c) Clearly identify all the parameters of the above equations
 - (d) Clearly identify all the initial parameters used in the Kalman filter
3. Write a MATLAB code to estimate, using Kalman filter, the state of a bias instability component of a particular gyroscope. Measurements are in hw6_prob3.dat. The parameters of the signal are
 - Sampling rate: 1 kHz
 - Correlation time: 0.1 sec
 - Measurement noise: 1 rad/sec
 - Bias instability (1σ): 1 rad/sec

Make sure you include the following in your answer

- (a) State equation
- (b) Measurement equation
- (c) Clearly identify all the parameters of the above equations
- (d) Clearly identify all the initial parameters used in the Kalman filter