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Homework #6 -- Prof. SUH

1. Results

A graph of a line

Description automatically generated

1. Design process without gyroscope bias term

A paper with mathematical equations

Description automatically generated

1. Matlab implementation

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| %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%  clc, clearvars, close all  %%%%%%%%%%%%%%%%%%%% (2) Find theta\_hat using the indirect KF %%%%%%%%%%%%%%%%%%%% without considering the gyroscope bias.  load attitude1.mat  r = var(z1);  q = var(z2);  load attitude2.mat  N = length(z1);  thetahat = zeros(N, 1);  P = r;  thetahat(1) = z1(1);  alpha = 2; % numerical integration error??  for k = 2:N  T = t(k) - t(k-1);  thetahat(k) = thetahat(k-1) + T \* z2(k-1);  P = P + alpha \* q \* T^2;  K = P \* inv(P + r);  delta\_theta = K \* (z1(k) - thetahat(k));  thetahat(k) = thetahat(k) + delta\_theta;  P = (1 - K) \* P;  end  n = norm( theta - thetahat)^2;  plot(t, theta, 'r', t, thetahat, 'b');  xlabel('Time'); ylabel('Theta and ThetaHat');  legend('Theta', 'ThetaHat'); |