Probabilistic Robotics
PRRO6, Fall 2017
Book Assignment 4.6.1
Assigned: Tuesday September 12;
Due: Thursday September 14, 13:00 in the afternoon

September 11, 2017

In this exercise, you will be asked to implement a histogram filter for a linear dynamical system studied in the previous chapter.

(a) Implement a histogram filter for the dynamical system described in Exercise 1 of the previous chapter (Exercise 3.8.1 at page 81). Use the filter to predict a sequence of posterior distributions for $t = 1, 2, \ldots, 5$. For each value of t, plot the joint posterior over x and $\dot{x}$ into a diagram, where x is the horizontal and $\dot{x}$ is the vertical axis.

(b) Now implement the measurement update step into your histogram filter, as described in Exercise 2 of the previous chapter (Exercise 3.8.1 at page 82). Suppose at time $t = 5$, we observe a measurement $z = 5$. State and plot the posterior before and after updating the histogram filter.

Hand-In

When you have completed the assignment, upload your solution to Blackboard, togehter with your solution of Assignment 4.6.4. This should be a PDF, with your Matlab scripts as pseudo-code (for example with the matlab-prettifier package). If you have only partially solved the assignment, upload your partial solution.