Extended Kalman Filter for Tracking a Three-Wheeled Robot

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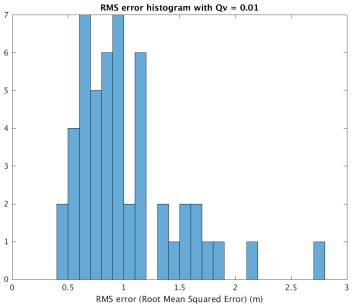
NOTE

Code for exercise was tested in MATLAB R2016b version:

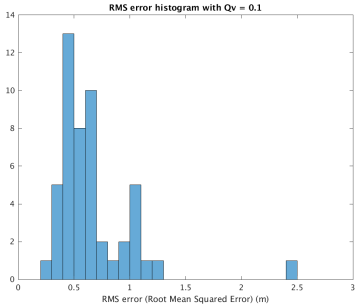
MathWorks, MATLAB R2016b (9.1.0.441655)
64-bit (maci64)

HISTOGRAM

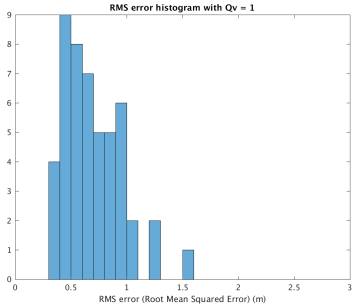
Histogram of the RMS(root-mean squared) tracking error of 50 runs



(a) $Q_v = 0.01$ (rad/s)^2/Hz



(b) $Q_v = 0.1$ (rad/s)^2/Hz

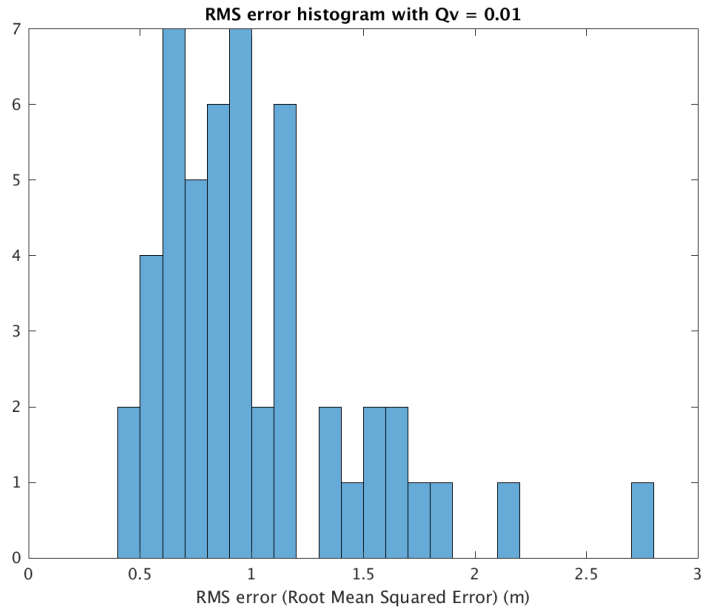


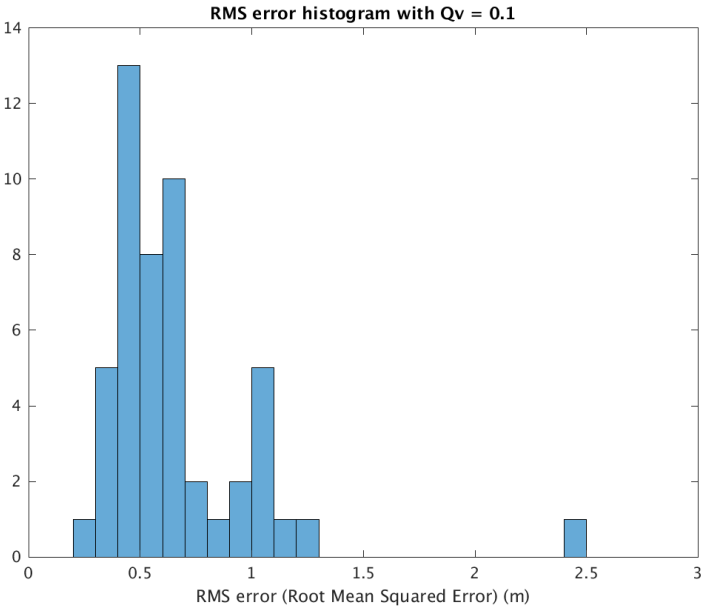
(c) $Q_v = 1.0$ (rad/s)^2/Hz

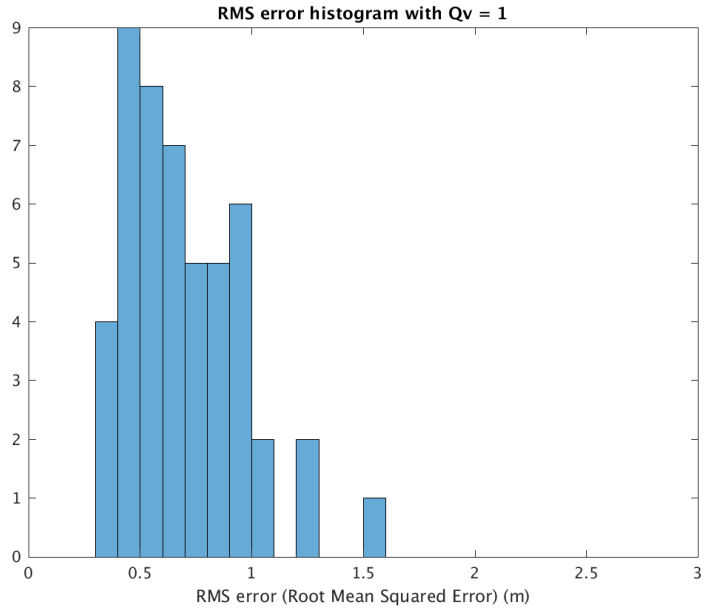
MEAN AND VARIANCE

Mean and Variance of RMS tracking error

	$Q_v = 0.01$	$Q_v = 0.1$	$Q_v = 1.0$
Mean	1.025	0.668	0.759
Variance	0.216	0.125	0.225


RMS error histogram with Qv = 0.01
RMS error (Root Mean Squared Error) (m)


RMS error histogram with Qv = 0.1
RMS error (Root Mean Squared Error) (m)


RMS error histogram with Qv = 1
RMS error (Root Mean Squared Error) (m)