Aalto University
School of Electrical
Engineering

Exercise Round 8

The deadline of this exercise round is **Wednesday March 18, 2020**. The solutions will be gone through during the exercise session in room T2 in Konemiehentie 2 (CS) on that day starting at 14:15.

The problems should be *solved before the exercise session*, and during the session those who have completed the exercises may be asked to present their solutions on the board/screen.

Exercise 1. (RTS Smoother with Non-Zero Mean Noises)

Derive the linear RTS smoother for the non-zero-mean noise model in Exercise 1 of Round 3.

Exercise 2. (Smoother for Gaussian Random Walk)

Implement the Gaussian random walk model smoother in Example 8.1 (in the book) and compare its performance to the corresponding Kalman filter. Plot the evolution of the mean and covariance of the smoothing distribution and compare them to the mean and covariance of the Kalman filter.

Exercise 3. (Smoother for Stochastic Resonator)

(a) Implement the RTS smoother for the resonator model in Exercise 3 on Round 3.

(b) Compare its RMSE performance to the filtering and baseline solutions and plot the results.