1. “Kalman\_1D\_example.pptx”. This is an illustrative example for a robot living in a 1D space. The Kalman filter algorithm applied for two steps is easy to understand.

2. Run the Matlab code “Kalman\_1D.m” to see how the Kalman filter works for 20 steps for the 1D robot localization. This code is the Matlab simulation for the worked example proposed in Kalkman\_1D\_example.pptx. Change the parameters of the Kalman filter and analyze the influence in the localization process.

3. “Bayes Filter.pptx”. The “geometric” simplification to understand Bayes Filter and Kalman Filter.

4. Bayes Filter, “MCR2\_Course6.1.pptx”. The mathematical foundation of the Bayes Filter.

5. “MCR2\_Course6.2.pptx” to understand how Kalman filter algorithms was obtained from the Bayes Filter under the assumption that the noise is Gaussian and the prediction and observation models are linear. Use the Lecture notes “Probabilistic Methods.pdf” to understand the conditioning property. To obtain the Kalman filter recursive algorithms two important properties for Gaussians are used, the Marginalization and the conditioning.

6. “MCR2\_Course6.3.pptx” to see the application of the Kalman filter algorithm for a non-holonomic robot localization moving in a 2D environment.

**Observation:** The Bayes Filter and the Kalman Filter from MCR2\_Course6.1.pptx and MCR2\_Course6.2.pptx are presented for any kind of systems. The particularisatrion of the Kalman Filter for a mobile robot, non-holonomic, is made in MCR2\_Course6.3.pptx.