SSY345 - Sensor fusion

Lecture: 3

Discrete-time state space model

Motion model: $x_k = f_{k-1}(x_{k-1}, q_{k-1}) \iff p(x_k | x_{k-1})$

Measurement model: $y_k = h_k(x_k, r_k) \iff p(y_k | x_k)$

where $x_0 \sim p(x_0)$

Known input signal (u_k)

$$\begin{cases} x_k = f_{k-1}(x_{k-1}, u_k, q_{k-1}) \\ y_k = h_k(x_k, u_k, r_k) \end{cases} \iff \begin{cases} p(x_k | x_{k-1}; u_k) \\ p(y_k | x_k; u_k) \end{cases}$$

Recursive filtering