SEZNAM VZORCŮ

Stavově prostorový model:

$$\mathbf{x}_t = \mathbf{A} \cdot \mathbf{x}_{t-1} + \mathbf{u}_t$$

$$\mathbf{z}_t = \mathbf{H} \cdot \xi_t + \mathbf{D}_t \cdot \mathbf{x}_t + \mathbf{v}_t$$

Kalmanův filtr:

Predikční rovnice Kalmanova filtru:

$$\mathbf{x}_{t|t-1} = \mathbf{A} \cdot \mathbf{x}_{t-1|t-1}$$

$$\mathbf{P}_{t|t-1} = \mathbf{A}\mathbf{P}_{t-1|t-1}\mathbf{A}' + \mathbf{\Sigma}_{uu}$$

Filtrovací rovnice Kalmanova filtru:

$$\mathbf{x}_{t|t} = \mathbf{x}_{t|t-1} + \mathbf{P}_{t|t-1}\mathbf{D}_t' \left(\mathbf{D}_t\mathbf{P}_{t|t-1}\mathbf{D}_t' + \mathbf{\Sigma}_{vv}\right)^{-1} \left(\mathbf{z}_t - \mathbf{z}_{t|t-1}\right)$$

$$\mathbf{P}_{t|t} = \mathbf{P}_{t|t-1} - \mathbf{P}_{t|t-1}\mathbf{D}_t' \left(\mathbf{D}_t\mathbf{P}_{t|t-1}\mathbf{D}_t' + \mathbf{\Sigma}_{vv}\right)^{-1} \mathbf{D}_t\mathbf{P}_{t|t-1}$$

Pozorovatelné veličiny:

$$\mathbf{z}_{t|t-1} = \mathbf{H} \cdot \xi_t + \mathbf{D}_t \cdot \mathbf{x}_{t|t-1}$$

$$E\left[\left(\mathbf{z}_t - \mathbf{z}_{t|t-1}\right)\left(\mathbf{z}_t - \mathbf{z}_{t|t-1}\right)' \;\middle|\; \xi_t, \mathbf{\Omega}_{t-1}\right] = \mathbf{D}_t\mathbf{P}_{t|t-1}\mathbf{D}_t' + \mathbf{\Sigma}_{vv}$$

Kalmanův smoother:

$$\mathbf{x}_{t|T} = \mathbf{x}_{t|t} + \mathbf{J}_t \left(\mathbf{x}_{t+1|T} - \mathbf{x}_{t+1|t}\right)$$

$$\mathbf{P}_{t|T} = \mathbf{P}_{t|t} + \mathbf{J}_t \left(\mathbf{P}_{t+1|T} - \mathbf{P}_{t+1|t}\right)\mathbf{J}_t'$$

$$\mathbf{J}_t = \mathbf{P}_{t|t}\mathbf{A}'\mathbf{P}_{t+1|t}^{-1}$$

Logaritmovaná věrohodnostní funkce:

$$\ln L\left(\boldsymbol{\theta} \mid \mathbf{\Omega}_T\right) = -\frac{T \cdot k}{2}\ln\left(2\pi\right) - \frac{1}{2}\sum_{t=1}^{T}\left[\ln\left|\mathbf{F}_{t|t-1}\right| + \left(\tilde{\mathbf{z}}_t'\mathbf{F}_{t|t-1}^{-1}\tilde{\mathbf{z}}_t\right)\right]$$