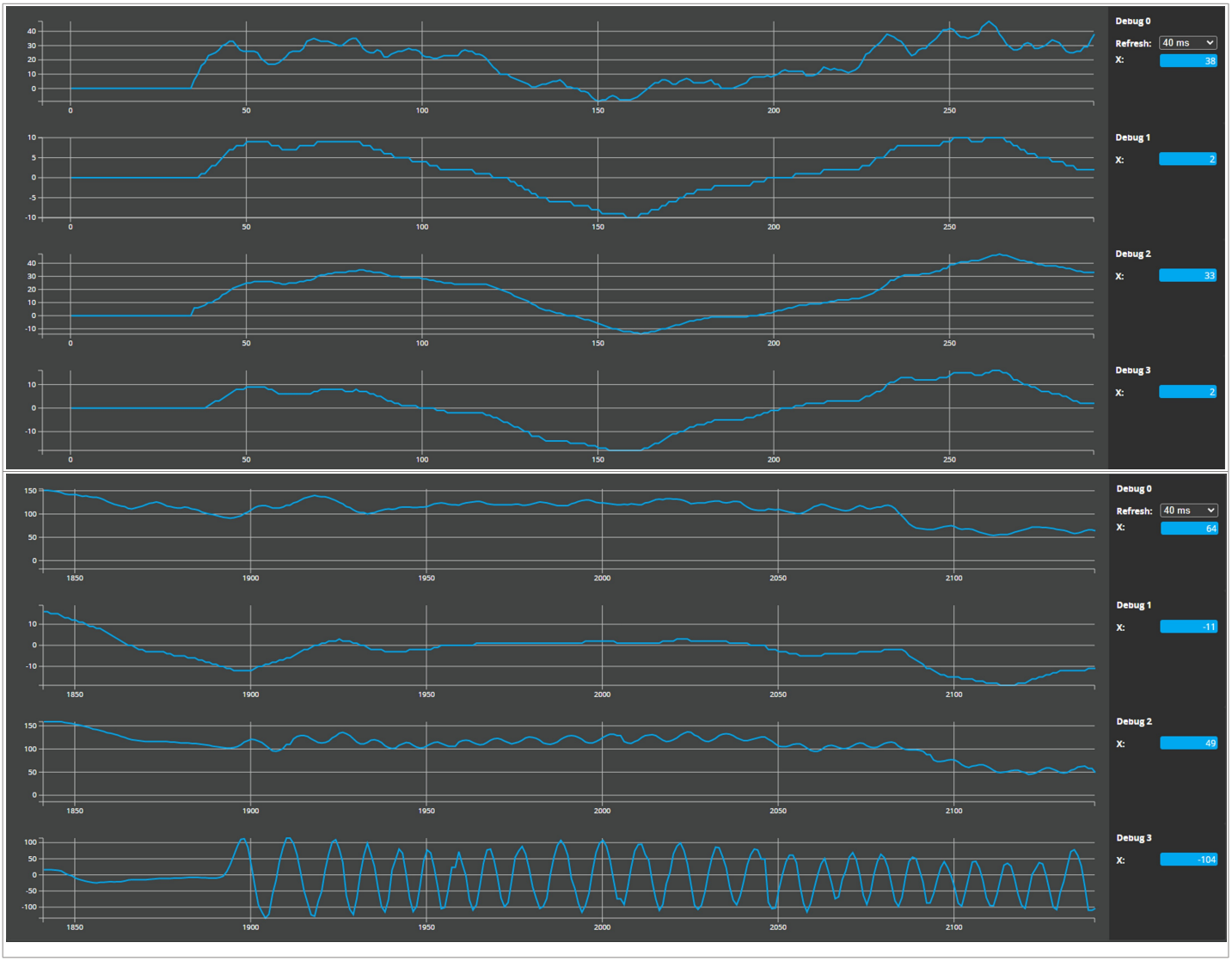
Position Estimator

Freitag, 2. September 2022 12:04



Notes:

Modell

$$\dot{x} = \begin{pmatrix} \dot{p} \\ \dot{v} \\ \dot{b}_a \end{pmatrix} = \begin{pmatrix} v \\ a_{cc} - b_a \\ -\omega_a \cdot b_a \end{pmatrix}$$

ss-Modell

$$x = \begin{pmatrix} p \\ v \\ b_a \end{pmatrix}$$

$$\dot{x} = \underbrace{\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ 0 & 0 & -\omega_a \end{pmatrix}}_{A} x + \underbrace{\begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}}_{B} \cdot a_{cc}$$

$C = I \qquad D = 0$

$\omega_a \geq 0$

$\omega_a \begin{cases} z \to 0 \\ x - y \to 70 \end{cases}$ zB. $0{,}05\ Hz \cdot 2 \cdot \pi$

Diskretisierung

$$\dot{x} = Ax + Bu$$

$$y = Cx + Du$$

$$\dot{x} \approx \frac{z-1}{T_s \cdot z} = \frac{1 - z^{-1}}{T_s}$$

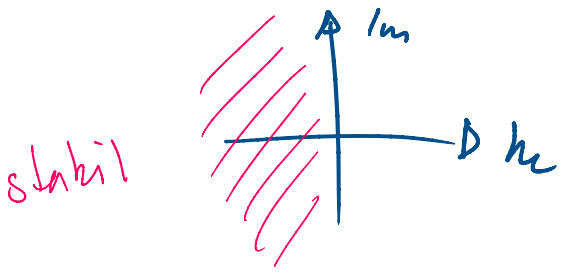
$\dot{x} = Ax + Bu$

$y = Cx + Du$

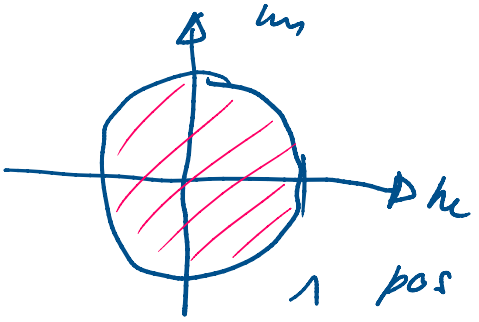
$\lambda \approx \frac{\cdot}{T_s \cdot z} = \frac{\cdot}{T_s}$

$(A, B, C, D) \mapsto (A_d, B_d, C_d, D_d)$

zeitkontinuierlich

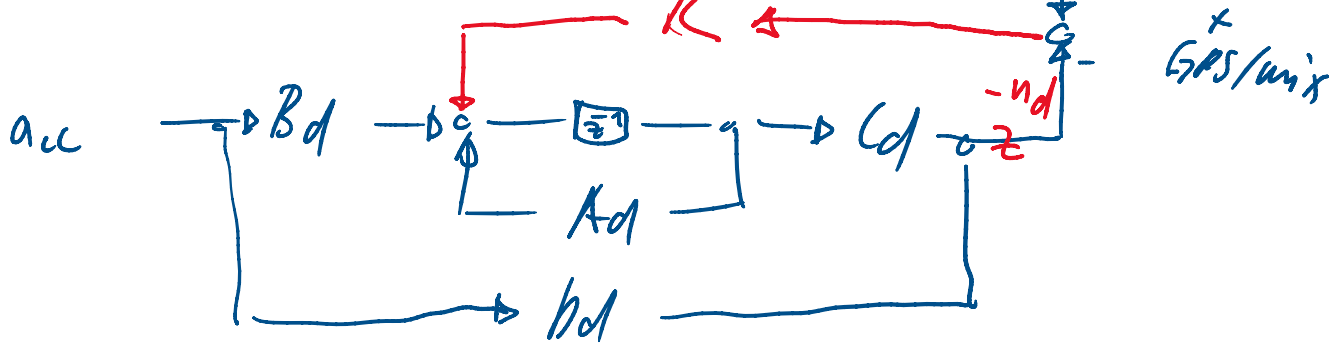


zeitdiskret



{ konv GAS
konv + GAS/unif

observer gain



$K \in \left\{ \lambda(A_d - K \cdot C_d(1,:)) \right\}$

$= \left\{ \begin{matrix} 1-h \\ 1-h \\ 1-h \end{matrix} \right.$