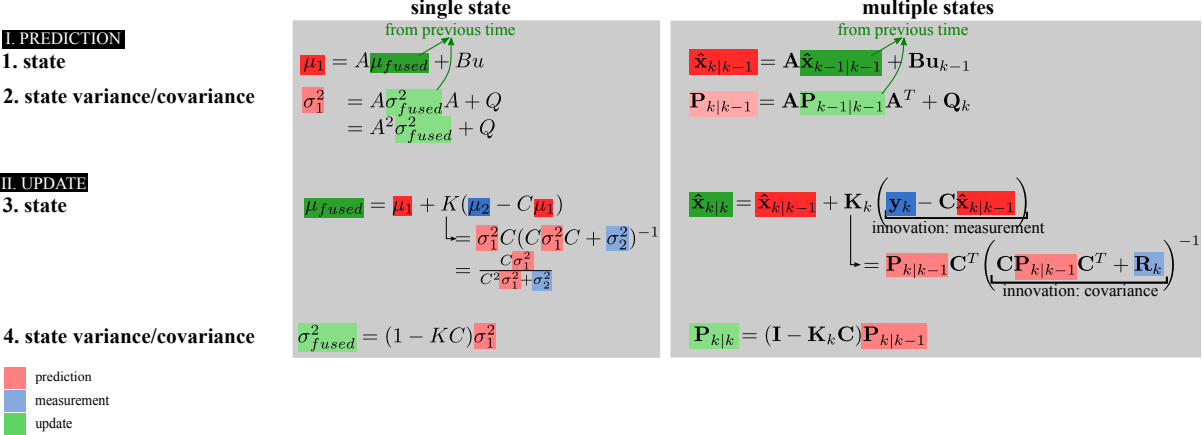
single state
multiple states
I. PREDICTION
1. state
2. state variance/covariance
from previous time
$\mu_1 = A\mu_{fused} + Bu$
$\sigma_1^2 = A\sigma_{fused}^2 A + Q$
$= A^2\sigma_{fused}^2 + Q$
$\hat{\mathbf{x}}_{k|k-1} = \mathbf{A}\hat{\mathbf{x}}_{k-1|k-1} + \mathbf{B}\mathbf{u}_{k-1}$
$\mathbf{P}_{k|k-1} = \mathbf{A}\mathbf{P}_{k-1|k-1}\mathbf{A}^T + \mathbf{Q}_k$
II. UPDATE
3. state
$\mu_{fused} = \mu_1 + K(\mu_2 - C\mu_1)$
$= \sigma_1^2 C(C\sigma_1^2 C + \sigma_2^2)^{-1}$
$= \frac{C\sigma_1^2}{C^2\sigma_1^2 + \sigma_2^2}$
$\hat{\mathbf{x}}_{k|k} = \hat{\mathbf{x}}_{k|k-1} + \mathbf{K}_k\left(\mathbf{y}_k - \mathbf{C}\hat{\mathbf{x}}_{k|k-1}\right)$
innovation: measurement
$= \mathbf{P}_{k|k-1}\mathbf{C}^T\left(\mathbf{C}\mathbf{P}_{k|k-1}\mathbf{C}^T + \mathbf{R}_k\right)^{-1}$
innovation: covariance
4. state variance/covariance
$\sigma_{fused}^2 = (1 - KC)\sigma_1^2$
$\mathbf{P}_{k|k} = (\mathbf{I} - \mathbf{K}_k\mathbf{C})\mathbf{P}_{k|k-1}$
prediction
measurement
update