



$$\mathbf{P}(0) = \mathbf{P}_0 = \mathbf{P}_0^\top > 0, \mathbf{P}_0 = \rho \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, \boldsymbol{\phi} = [y(k-1) \quad u(k-1)]^\top,$$

$$\boldsymbol{\theta} = [\theta_1 \quad \theta_2]^\top, \hat{\boldsymbol{\theta}} = [\hat{\theta}_1 \quad \hat{\theta}_2]^\top, \hat{\alpha}_0 = \frac{-\ln \hat{\theta}_1}{T_S}, \hat{\alpha}_1 = \frac{\hat{\alpha}_0 \hat{\theta}_2}{1 - \hat{\theta}_1}, \text{ and}$$

T_S is sampling time.