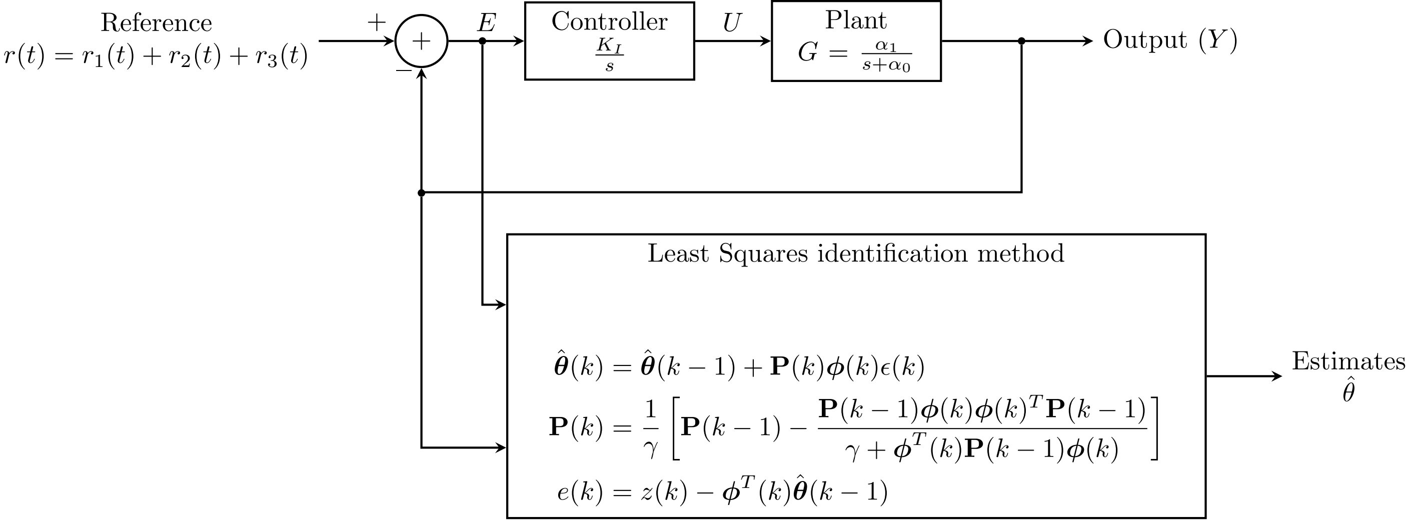

$$\mathbf{P}(0) = \mathbf{P}_0 = \mathbf{P}_0^{\intercal} > 0,\ \mathbf{P}_0 = \rho\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix},\ z = y(k) - y(k-1),\ \boldsymbol{\phi} = \begin{bmatrix}e(k-1) + e(k-2)\\ y(k-1) - y(k-2)\end{bmatrix},\ \boldsymbol{\theta} = \begin{bmatrix}\theta_1\\ \theta_2\end{bmatrix},$$

$\hat{\alpha_0} = -\frac{\ln\hat{\theta_2}}{T_S}$, $\hat{\alpha_1} = \frac{2\hat{\theta_1}\hat{\alpha_0}}{T_S(1-\hat{\theta_2})K_I}$, and T_S is sampling time.