Reference 
$$r(t) = r_1(t) + r_2(t) + r_3(t) \xrightarrow{\qquad \qquad } E \xrightarrow{\qquad \qquad } Controller \xrightarrow{\qquad \qquad } U \xrightarrow{\qquad \qquad } Clent G = \frac{b}{s+a} \xrightarrow{\qquad \qquad } Coutput \ (Y)$$

$$Identification \\ P(k) = P(k-1) - \frac{P(k-1)\phi(k)\phi^{\intercal}(k)P(k-1)}{1+\phi^{\intercal}(k)P(k-1)\phi(k)}$$

$$e(k) = z(k) - \phi^{\intercal}(k)\hat{\theta}(k-1)$$

$$\hat{\theta}(k) = \hat{\theta}(k-1) + P(k)\phi(k)e(k)$$

$$Estimates \\ \hat{\theta}$$

$$\theta(k) = \hat{\theta}(k-1) + P(k)\phi(k)e(k)$$

$$\phi = \begin{bmatrix} e(k-1) + e(k-2) \\ y(k-1) - y(k-2) \end{bmatrix}, \ \theta = \begin{bmatrix} \theta_1 \\ \theta_2 \end{bmatrix}, \ \hat{a} = -\frac{\ln \hat{\theta}_2}{T_S}, \ \hat{b} = \frac{2\hat{\theta}_1\hat{a}}{T_S(1-\hat{\theta}_2)K_I},$$
and  $T_S$  is sampling time.