



Reference model:

$$\dot{y}_m + a_m y_m = b_m r$$

Error:

$$e = y - y_m$$

Adaptive control algorithm:

$$u = \hat{a}_r r + \hat{a}_y y$$

$$\dot{\hat{a}}_r = -\gamma e r$$

$$\dot{\hat{a}}_y = -\gamma e y$$

T_S is sampling time.