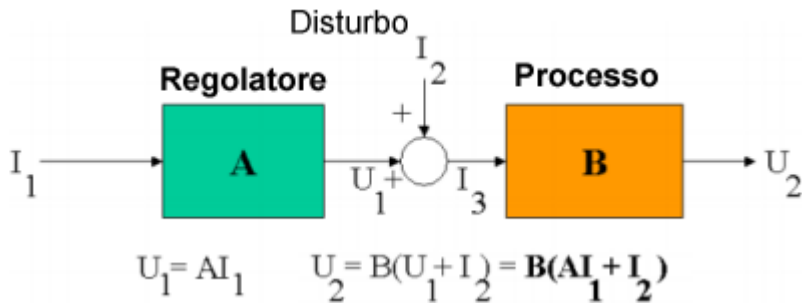


Sistema ad anello chiuso PI



Effetto di un disturbo in ingresso al processo controllato

$\tau := 12$ $A_o := 1$ $t := 0, 0.1.. 100$ $K_{p1} := 1$ $T_{i1} := 10$

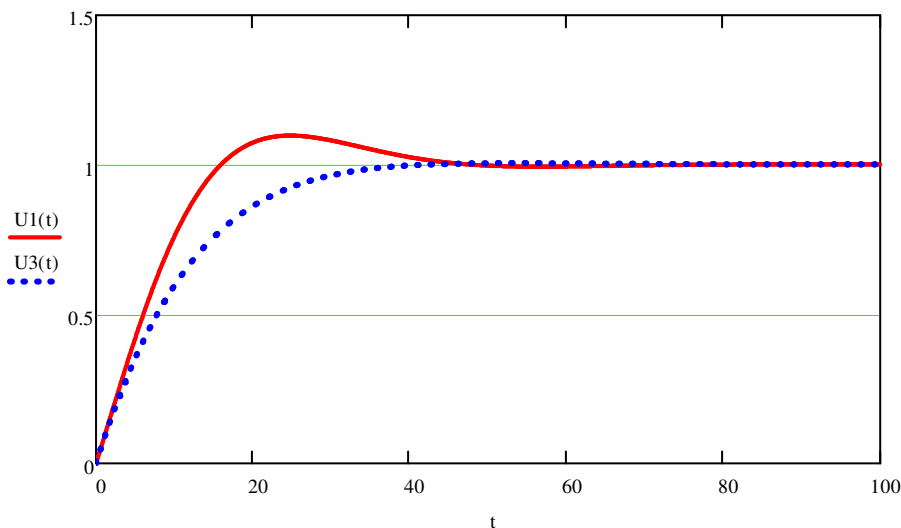
$G_f(s) := \frac{A_o}{1 + s \cdot \tau}$ $E(s) := \frac{1}{s}$ $D(s) := \frac{1}{10 \cdot s}$ $G_{c1}(s) := K_{p1} \cdot \left(1 + \frac{1}{T_{i1} \cdot s}\right)$

$G_1(s) := \frac{(G_{c1}(s) + D(s)) \cdot G_f(s)}{1 + (G_{c1}(s) + D(s)) \cdot G_f(s)}$ simplify $\rightarrow \frac{5 \cdot s + 1}{60 \cdot s^2 + 10 \cdot s + 1}$

$U_1(s) := E(s) \cdot G_1(s)$ $U_1(t) := U_1(s)$ invlaplace $\rightarrow 1 - \cos\left(\frac{\sqrt{5} \cdot \sqrt{7} \cdot t}{60}\right) \cdot e^{-\frac{t}{12}}$

$K_{p3} := 1$ $T_{i3} := 10$ $G_{c3}(s) := K_{p3} \cdot \left(1 + \frac{1}{T_{i3} \cdot s}\right)$ $G_3(s) := \frac{G_{c3}(s) \cdot G_f(s)}{1 + G_{c3}(s) \cdot G_f(s)}$ simplify $\rightarrow \frac{10 \cdot s + 1}{120 \cdot s^2 + 20 \cdot s + 1}$

$U_3(s) := E(s) \cdot G_3(s)$ $U_3(t) := U_3(s)$ invlaplace $\rightarrow 1 - e^{-\frac{t}{12}} \cdot \cos\left(\frac{\sqrt{5} \cdot t}{60}\right)$



La retroazione annulla il disturbo e mantiene il sistema stabile