$R_{a\_actual} := 0.6$ $L_{a\_actual} := 0.001$ $K_{b\_actual} := 0.69$

$J_{actual} := 0.1$ $B_{actual} := 1.0$ $K_{t\_actual} := 2.0$

$\tau_{loss} := 0.1$

$t_{start} := 0$ $t_{end} := 0.25$ $Dt := 0.001$

$t_{range} := t_{start}, t_{start} + Dt .. t_{end}$ need to convert a range variable to an array or vector

$t_{sim} :=$
$i \leftarrow 0$
for $fill \in 0, Dt .. t_{end}$
$temp_j \leftarrow fill$
$j \leftarrow j + 1$
return $temp$

$V_{IN} := 12$

$V_{in}(t) :=$ if $t > 0$
V_{IN}
else
0

Guess Values

Constraints

$$\frac{d}{dt} Ia(t) = \frac{\left(V_{in}(t) - R_{a\_actual} \cdot Ia(t) - K_{b\_actual} \cdot \omega(t)\right)}{L_{a\_actual}}$$

$$\frac{d}{dt} \omega(t) = \frac{\left(K_{t\_actual} \cdot Ia(t) - B_{actual} \cdot \omega(t) - \tau_{loss}\right)}{J_{actual}}$$

$Ia(0) = 0$

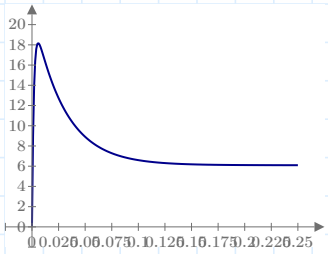
$\omega(0) = 0$

Solver

$Sol\_sim := \mathbf{odesolve}\left(\begin{bmatrix} Ia(t) \\ \omega(t) \end{bmatrix}, \max(t_{sim})\right)$

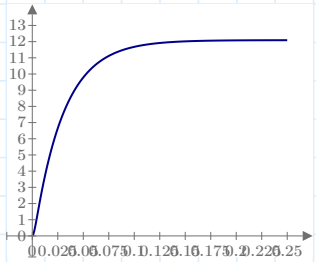
$I_A := Sol\_sim_0$ $\omega := Sol\_sim_1$

$i := 0 .. 250$



$I_A\left(t_{sim_i}\right)$

t_{sim_i}



$\omega\left(t_{sim_i}\right)$

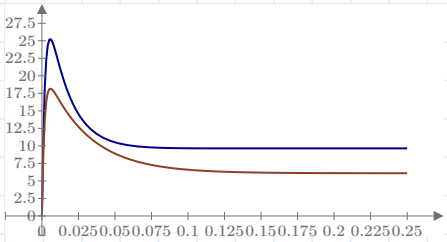
t_{sim_i}

$Imeasure := \mathrm{READTEXT}\left(\text{“..\Documents\Saber\_Projects\motor\_curr.txt”}\right)$

$\mathrm{I}_{measure} := Imeasure^{\langle 1 \rangle}$ data measured at 1ms sampling $t_{measure} := Imeasure^{\langle 0 \rangle}$

$Spdmeasure := \mathrm{READTEXT}\left(\text{“..\Documents\Saber\_Projects\motor\_speed.txt”}\right)$

$\omega_{measure} := Spdmeasure^{\langle 1 \rangle}$

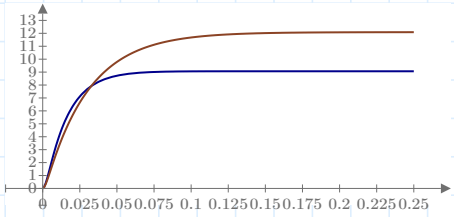


$\mathrm{I}_{measure}$

$I_A\left(t_{sim_i}\right)$

$t_{measure}$

t_{sim_i}



$\omega_{measure}$

$\omega\left(t_{sim_i}\right)$

$t_{measure}$

t_{sim_i}