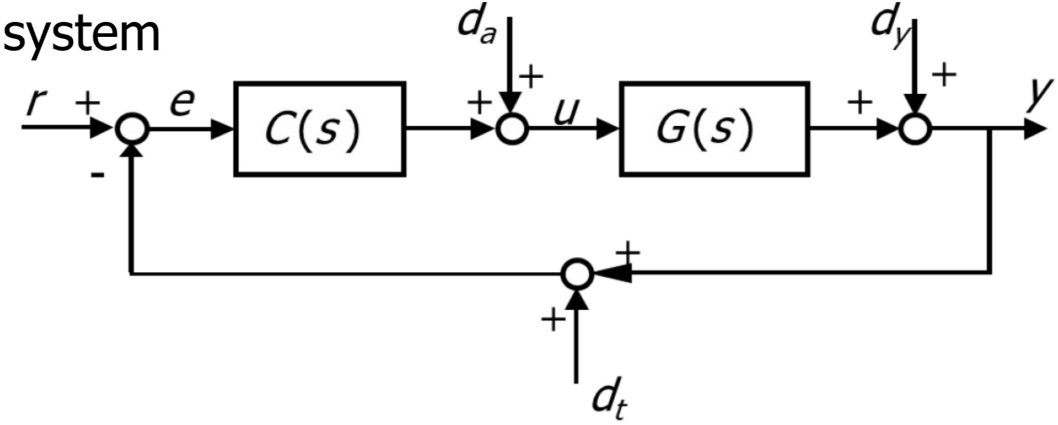
Consider the feedback control system



where

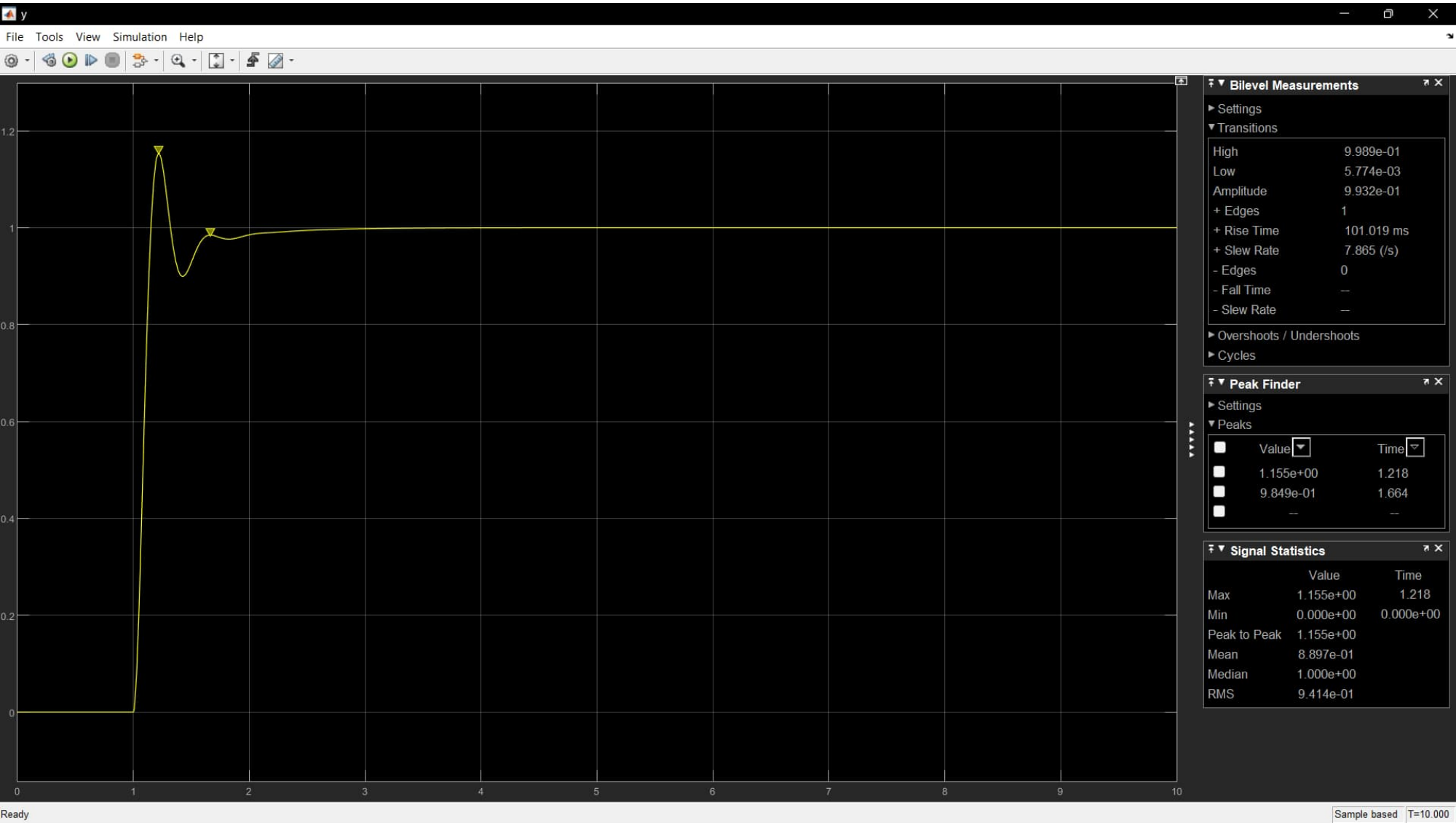
$$G(s)=\frac{2}{(1+0.2s)(1+0.1s)},d_a(t)=\delta_a\varepsilon(t),|\delta_a|\le 0.2$$

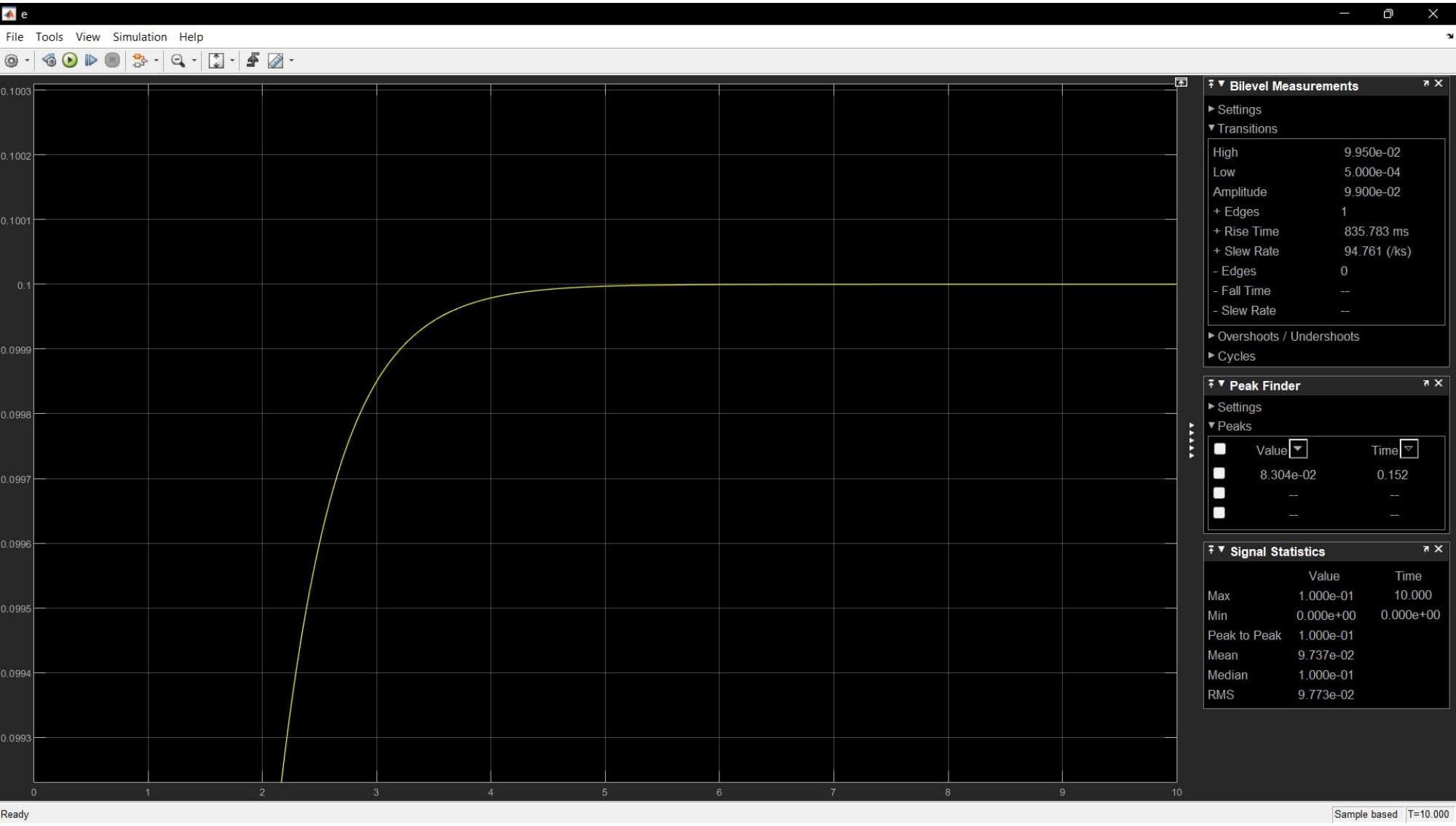
design the cascade controller $C(s)$ to satisfy the following requirements.

$$\begin{cases}\left|e_r^{\infty}\right|\le 0.1, r(t)=t\varepsilon(t)\\ \left|y_{d_a}^{\infty}\right|=0\end{cases}$$

$\hat{s}\le 30\%$

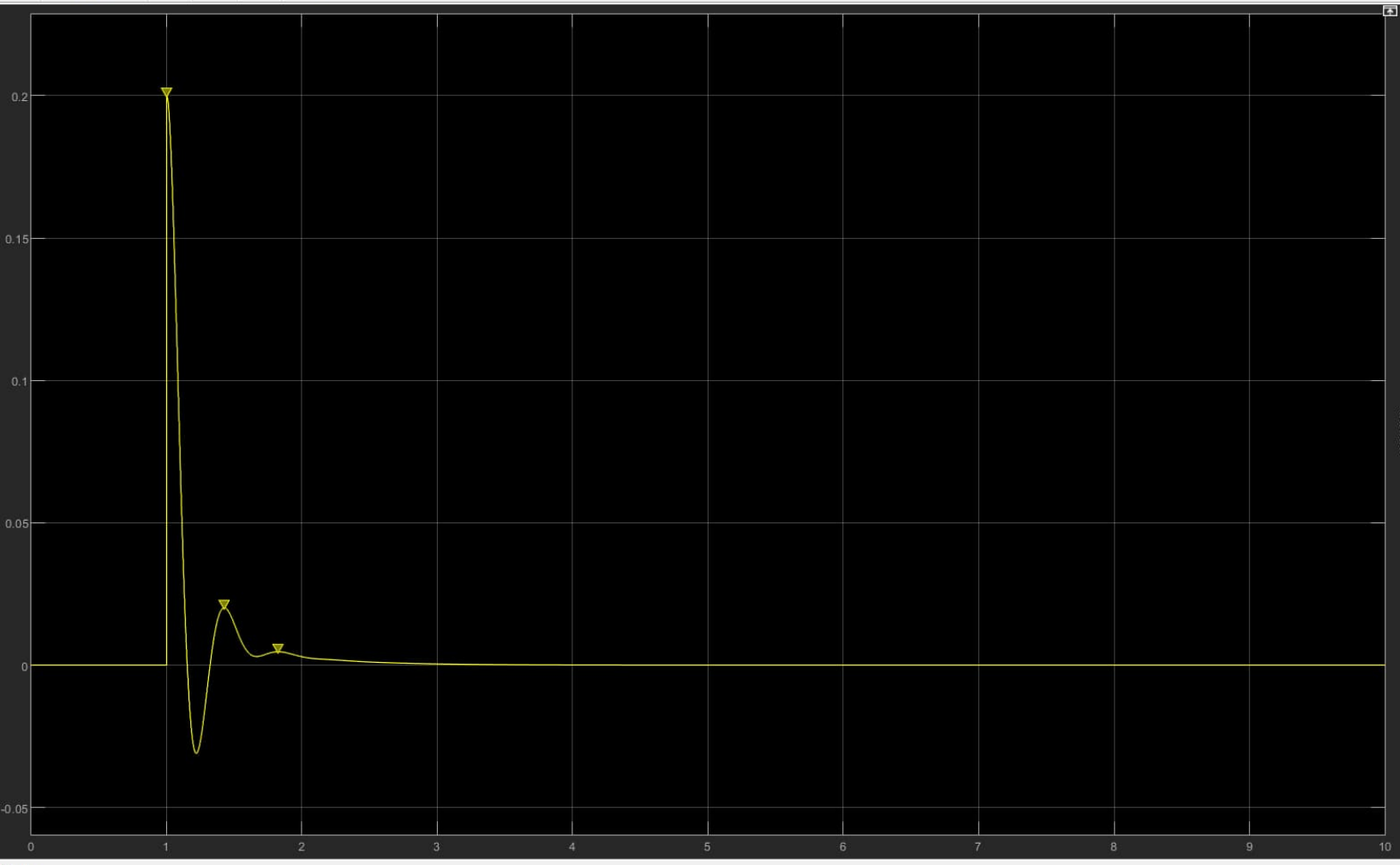
$t_r\le 0.3\text{s}$


y
File Tools View Simulation Help
1.2
1
0.8
0.6
0.4
0.2
0
0 1 2 3 4 5 6 7 8 9 10
Bilevel Measurements
Settings
Transitions
High 9.989e-01
Low 5.774e-03
Amplitude 9.932e-01
+ Edges 1
+ Rise Time 101.019 ms
+ Slew Rate 7.865 (/s)
- Edges 0
- Fall Time --
- Slew Rate --
Overshoots / Undershoots
Cycles
Peak Finder
Settings
Peaks
Value Time
1.155e+00 1.218
9.849e-01 1.664
-- --
Signal Statistics
Value Time
Max 1.155e+00 1.218
Min 0.000e+00 0.000e+00
Peak to Peak 1.155e+00
Mean 8.897e-01
Median 1.000e+00
RMS 9.414e-01
Ready
Sample based T=10.000


e
File Tools View Simulation Help
0.1003
0.1002
0.1001
0.1
0.0999
0.0998
0.0997
0.0996
0.0995
0.0994
0.0993
0 1 2 3 4 5 6 7 8 9 10
Bilevel Measurements
Settings
Transitions
High 9.950e-02
Low 5.000e-04
Amplitude 9.900e-02
+ Edges 1
+ Rise Time 835.783 ms
+ Slew Rate 94.761 (/ks)
- Edges 0
- Fall Time --
- Slew Rate --
Overshoots / Undershoots
Cycles
Peak Finder
Settings
Peaks
Value Time
8.304e-02 0.152
-- --
-- --
Signal Statistics
Value Time
Max 1.000e-01 10.000
Min 0.000e+00 0.000e+00
Peak to Peak 1.000e-01
Mean 9.737e-02
Median 1.000e-01
RMS 9.773e-02
Ready
Sample based
T=10.000

y_a

File Tools View Simulation Help



Peak Finder

- Settings
- Peaks

Value	Time
2.000e-01	1.000
2.016e-02	1.425
4.711e-03	1.823

Bilevel Measurements

- Settings
- Transitions

High	1.988e-01
Low	2.150e-04
Amplitude	1.986e-01
+ Edges	1
+ Rise Time	5.662 fs
+ Slew Rate	28.064 (/ps)
- Edges	1
- Fall Time	101.019 ms
- Slew Rate	-1.573 (/s)

- Overshoots / Undershoots
- Cycles

Ready

Sample based T=10.000