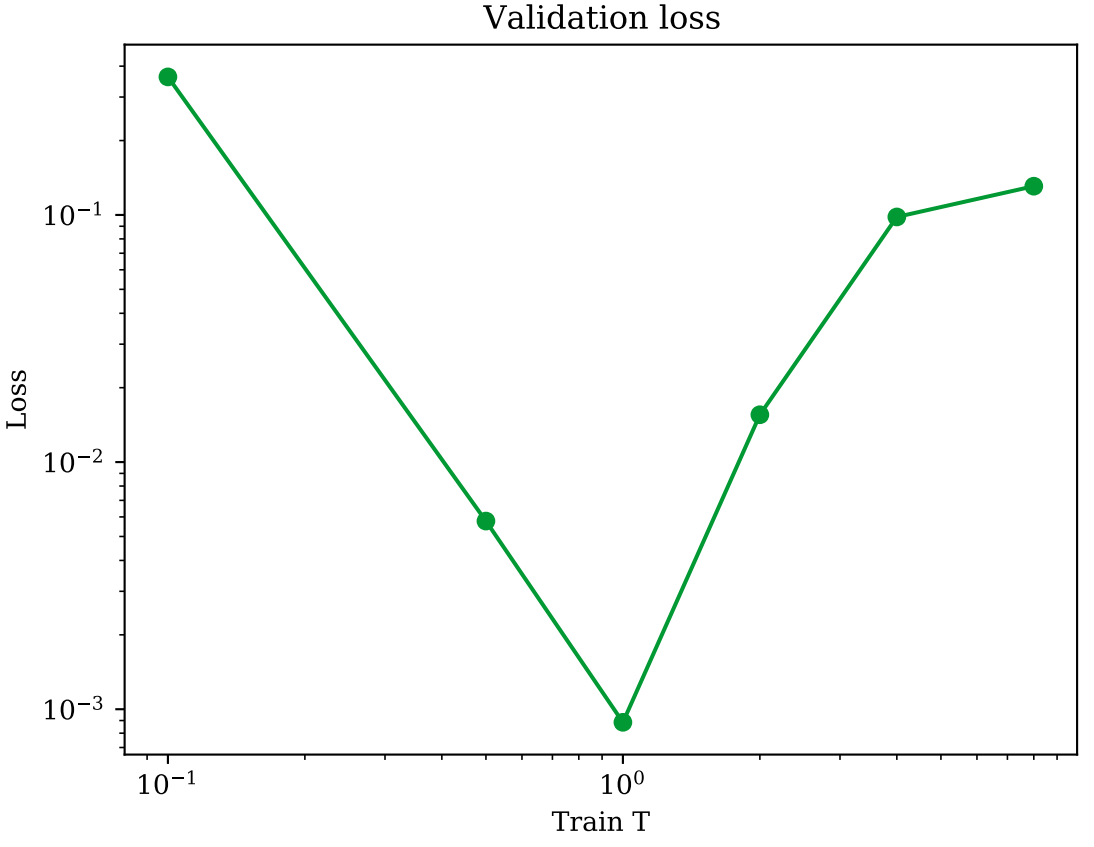
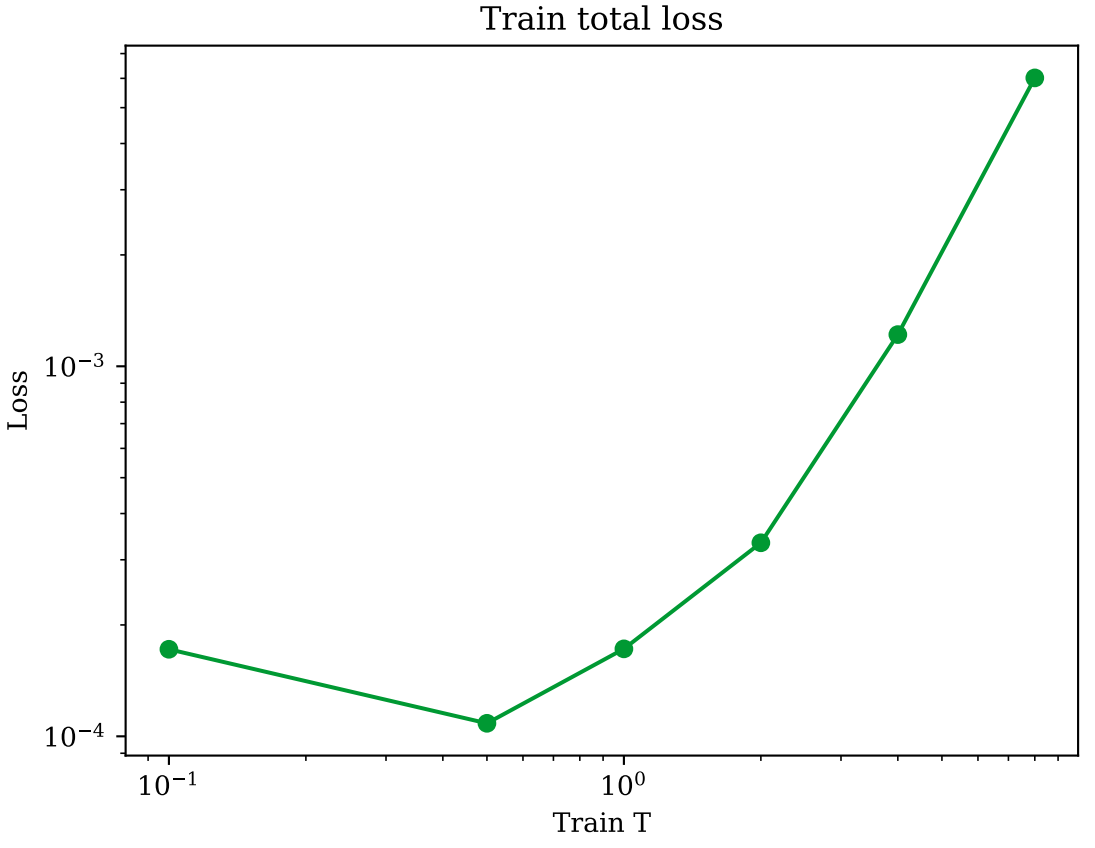
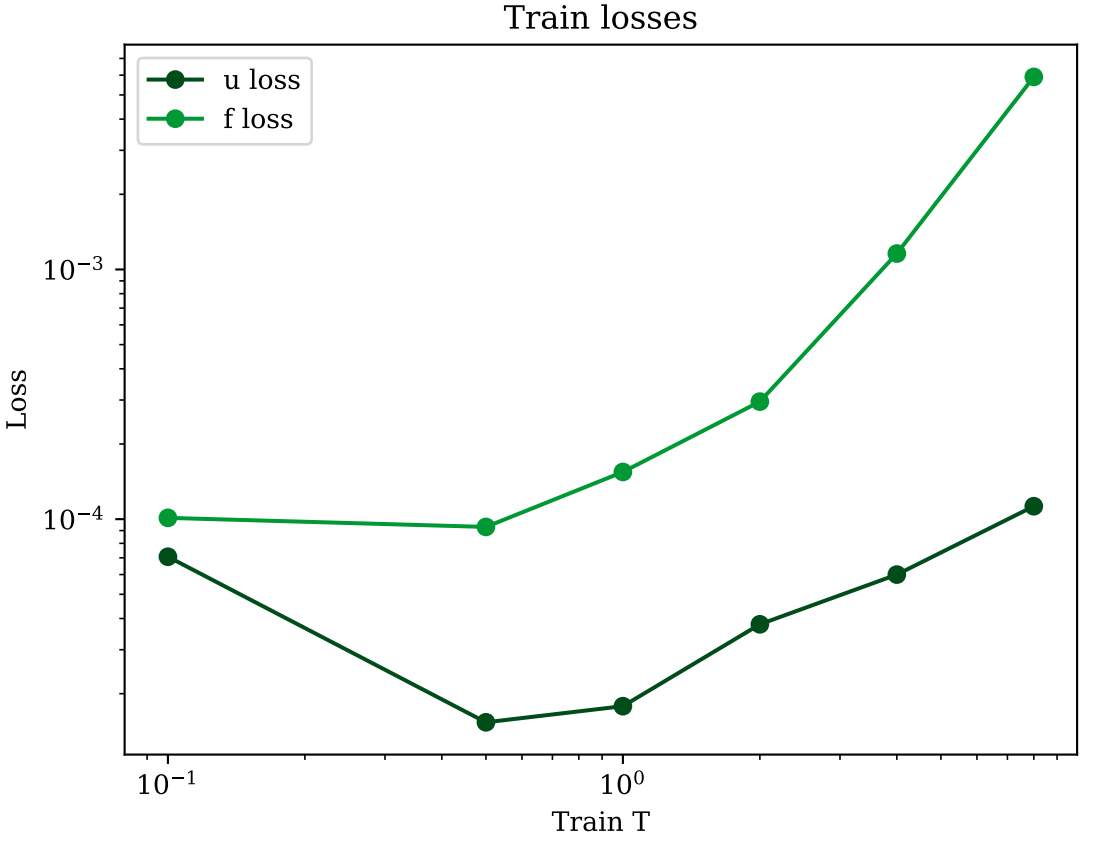
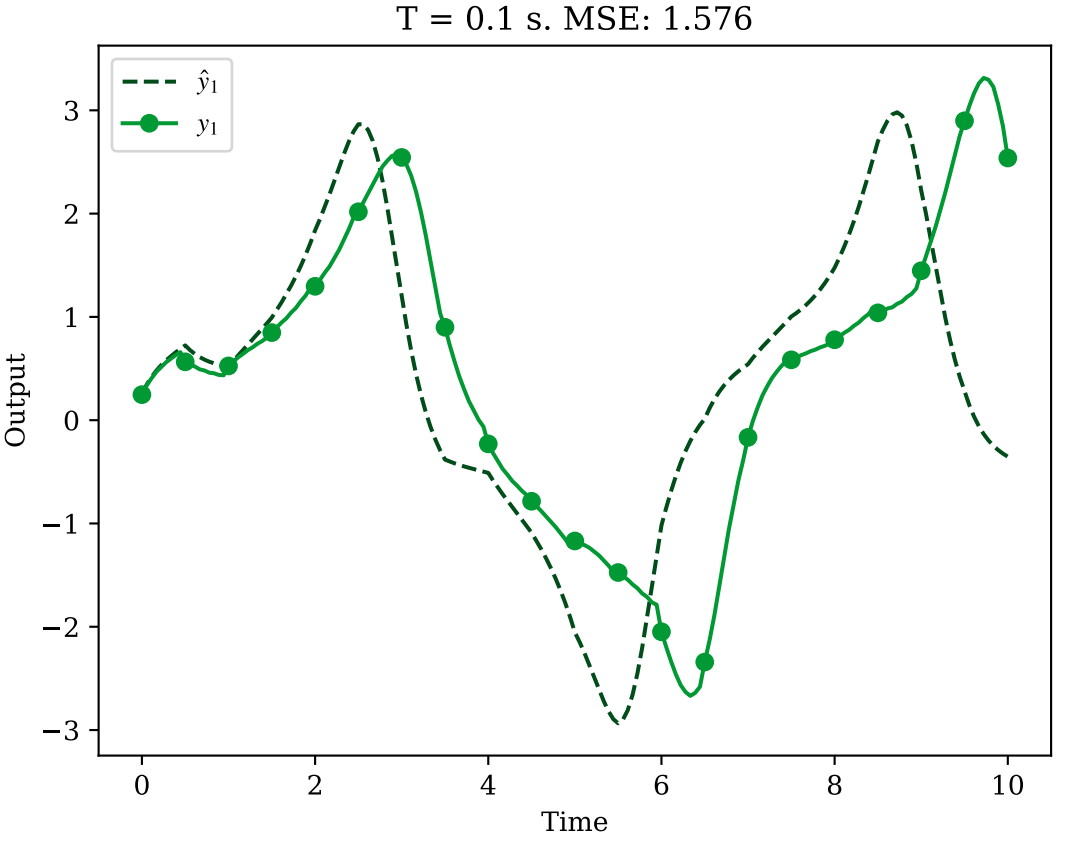
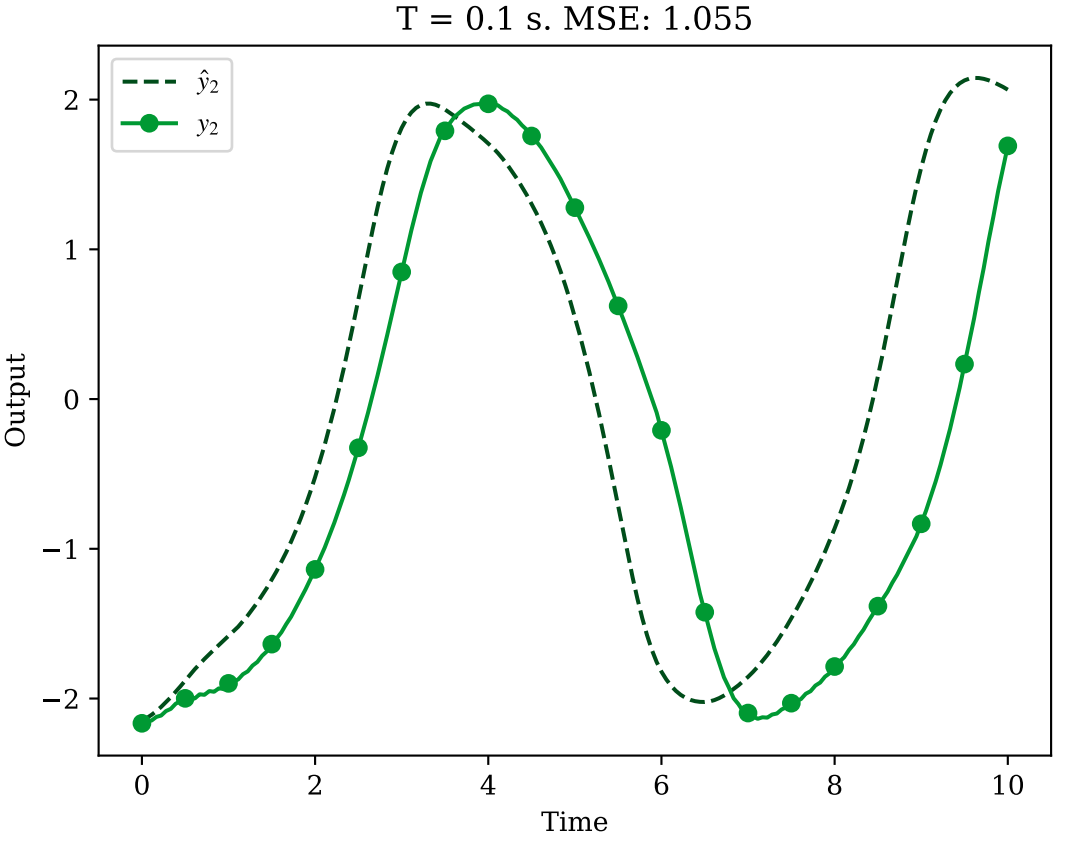
Neural network's T test:
Test duration -> 10:51:55.908317
Adam epochs -> 500
Max L-BFGS iterations -> 2000
Neural network's structure -> 4 hidden layers of 15 neurons
Train Nu -> 1000
Train Nf -> 100000
Validation points -> 1810
Validation T -> 0.5 s
Test points -> 181
Test T -> 0.5 s

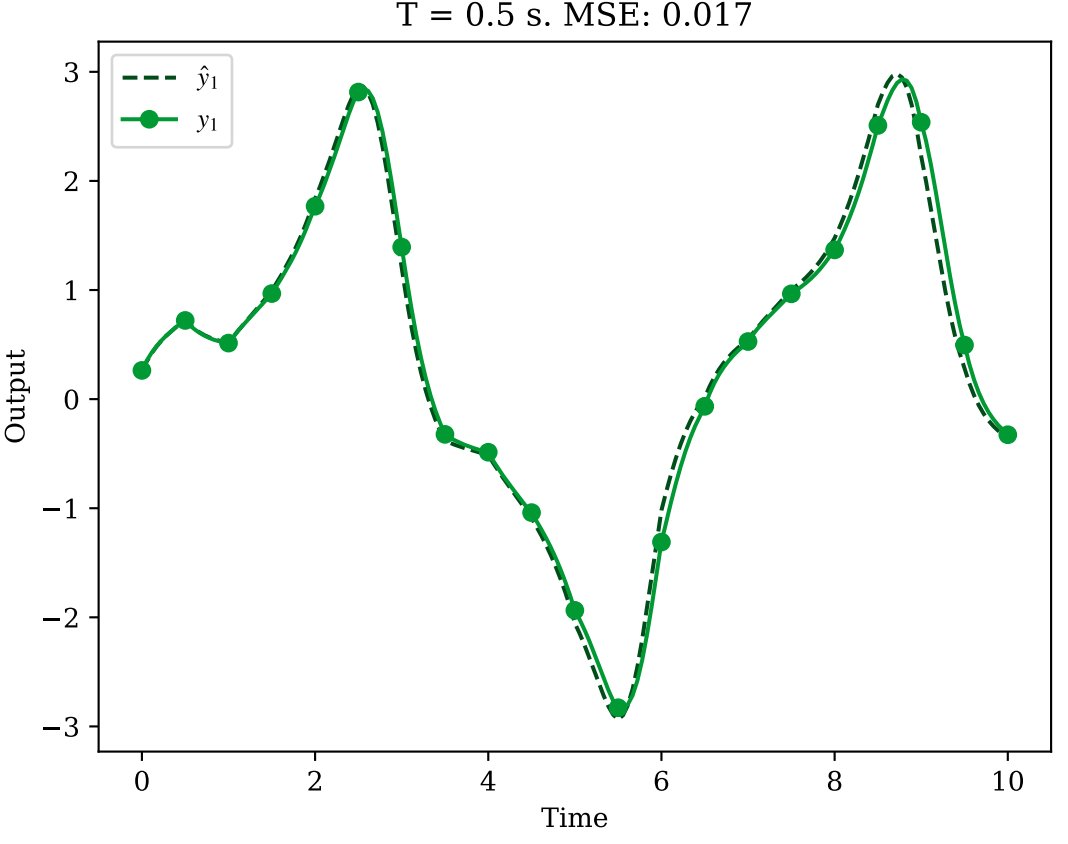

Validation loss
Loss
$10^{-1}$
$10^{-2}$
$10^{-3}$
$10^{-1}$
$10^{0}$
Train T

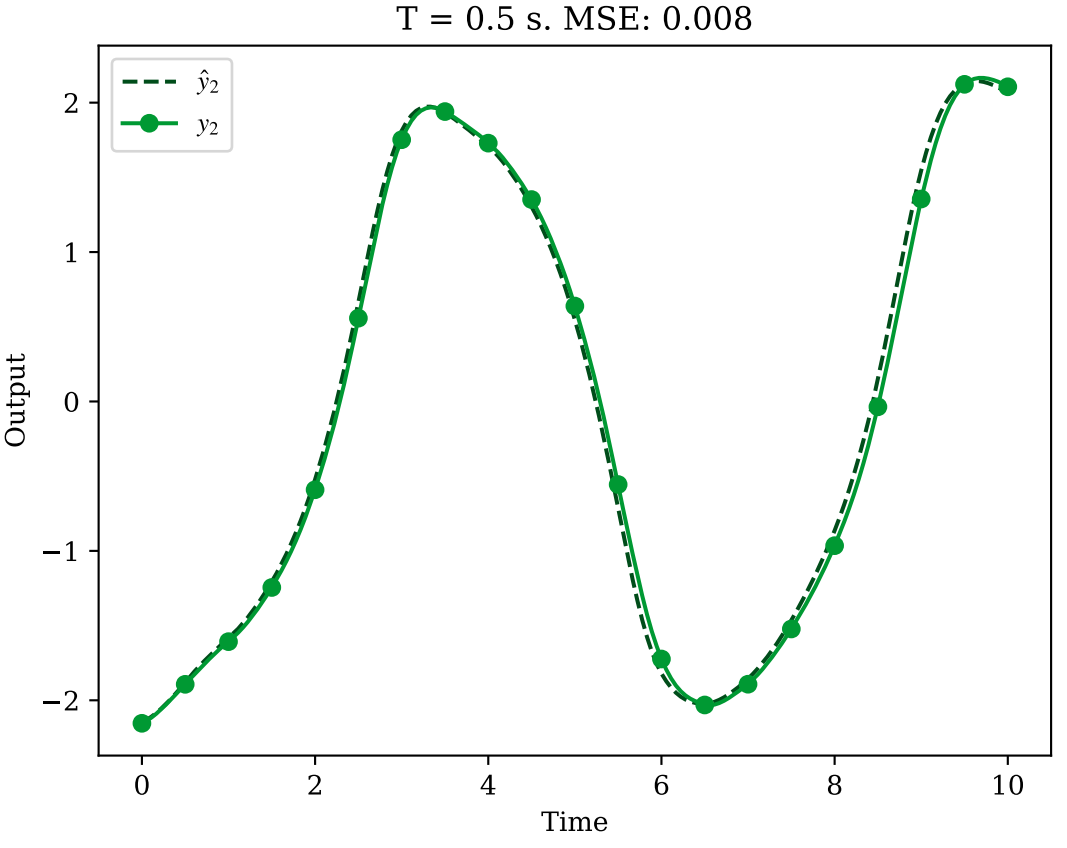

Train total loss
Loss
$10^{-3}$
$10^{-4}$
$10^{-1}$
$10^{0}$
Train T

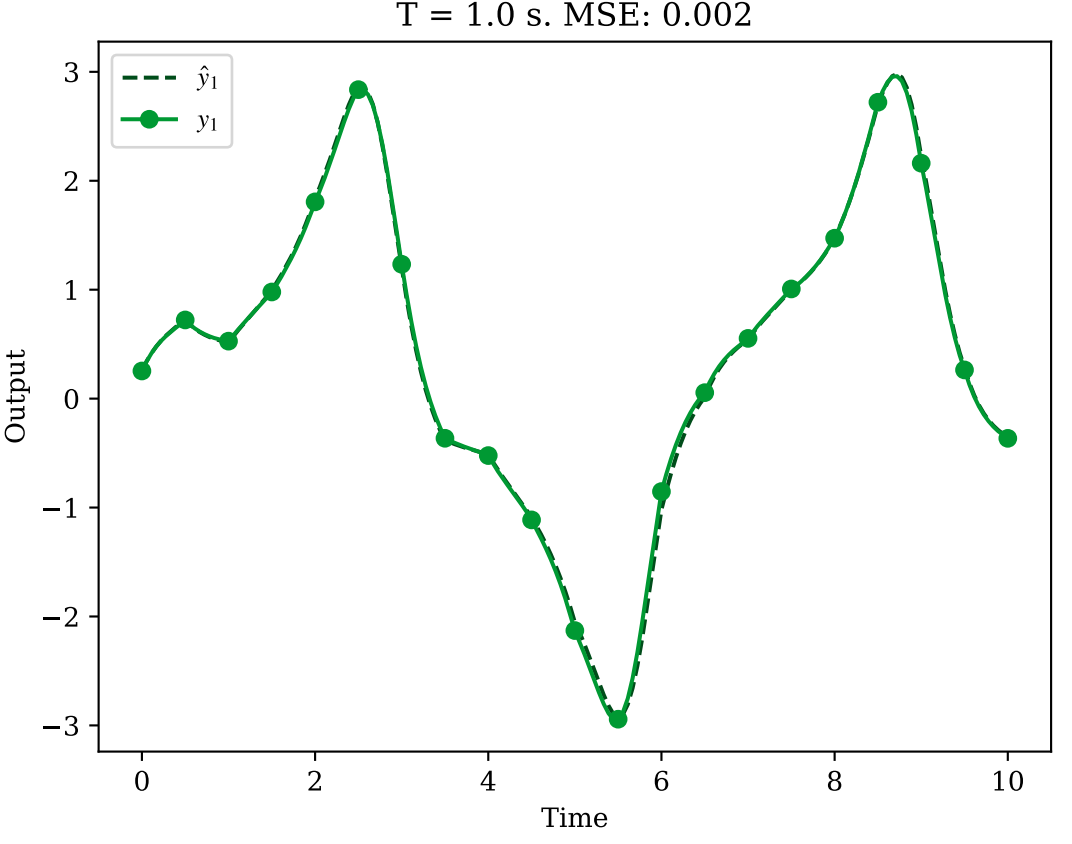

Train losses
u loss
f loss
$10^{-3}$
$10^{-4}$
Loss
$10^{-1}$
$10^{0}$
Train T

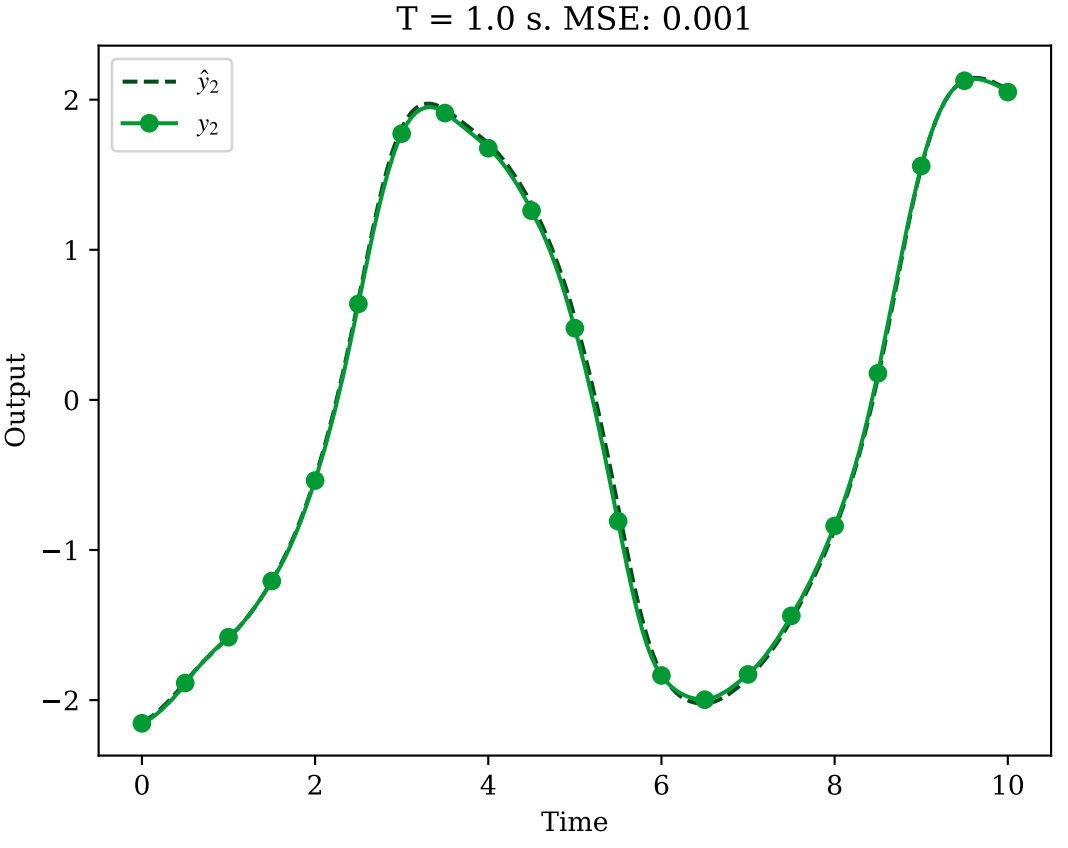

T = 0.1 s. MSE: 1.576
$\hat{y}_1$
$y_1$
Output
Time
3
2
1
0
−1
−2
−3
0
2
4
6
8
10

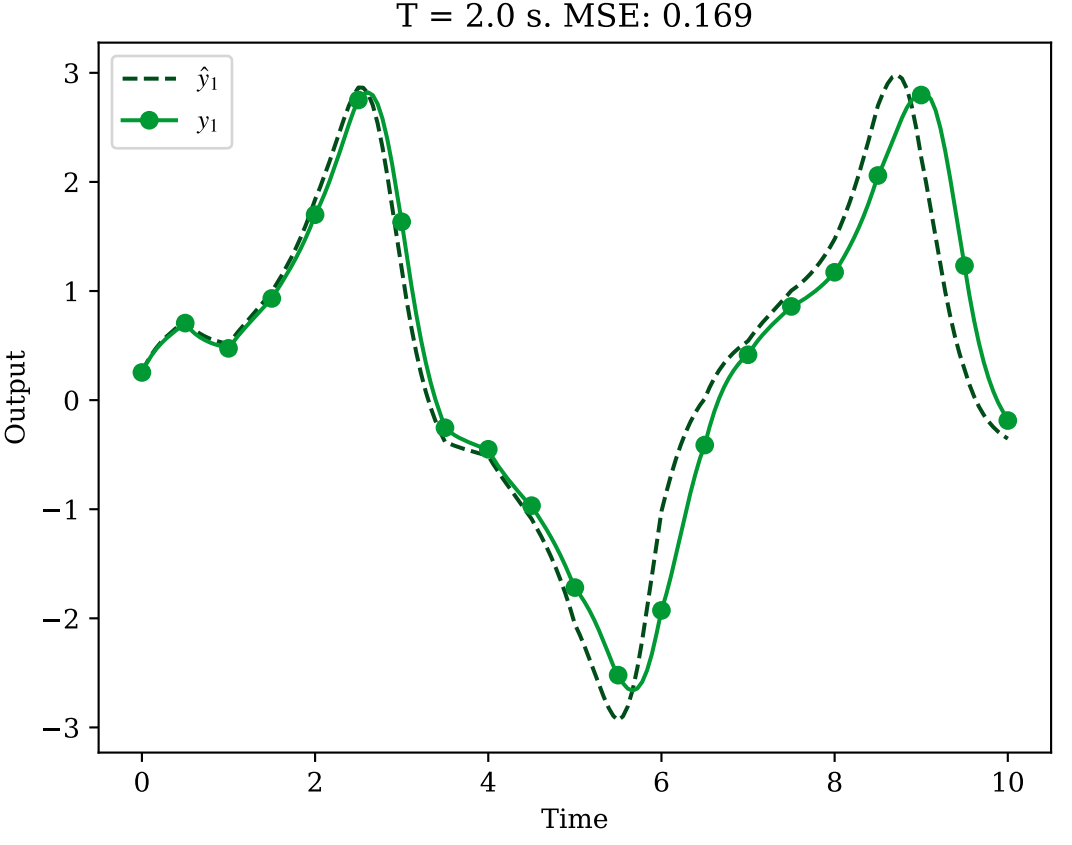

T = 0.1 s. MSE: 1.055
$\hat{y}_2$
$y_2$
Output
Time
2
1
0
−1
−2
0
2
4
6
8
10

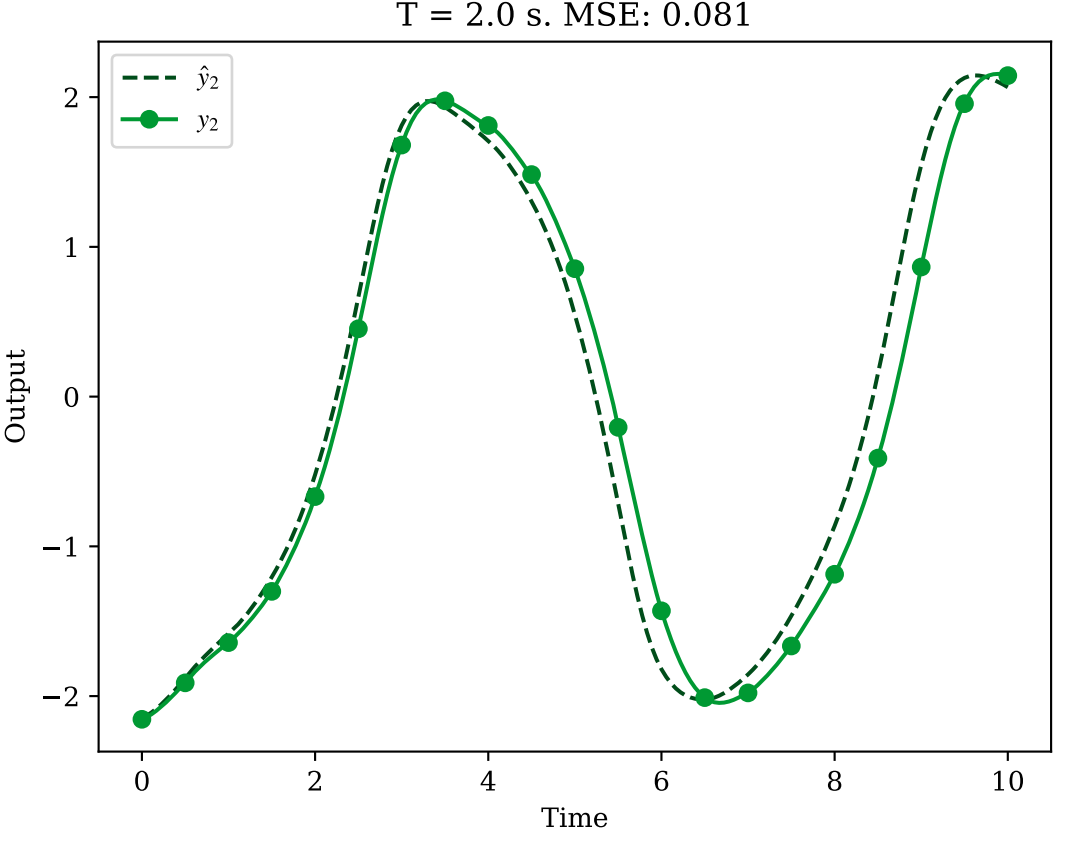

T = 0.5 s. MSE: 0.017
$\hat{y}_1$
$y_1$
Output
Time
3
2
1
0
−1
−2
−3
0
2
4
6
8
10

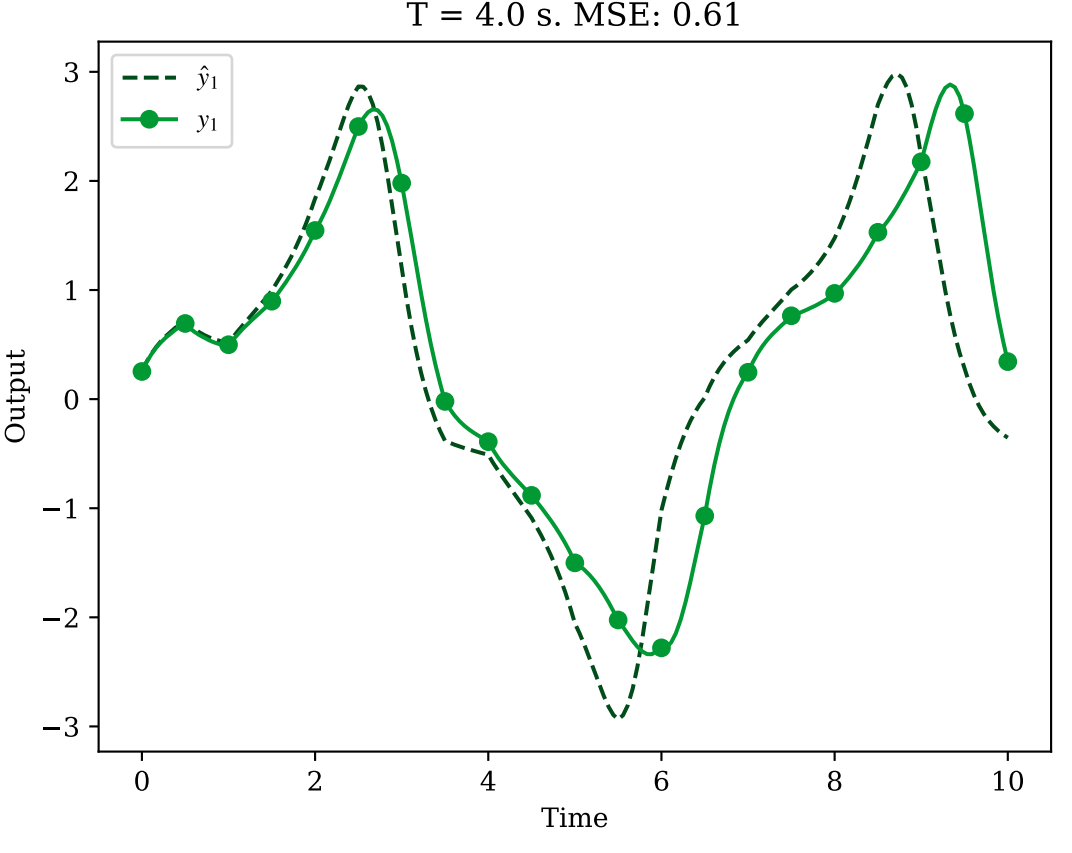

T = 0.5 s. MSE: 0.008
$\hat{y}_2$
$y_2$
Output
Time
2
1
0
−1
−2
0
2
4
6
8
10

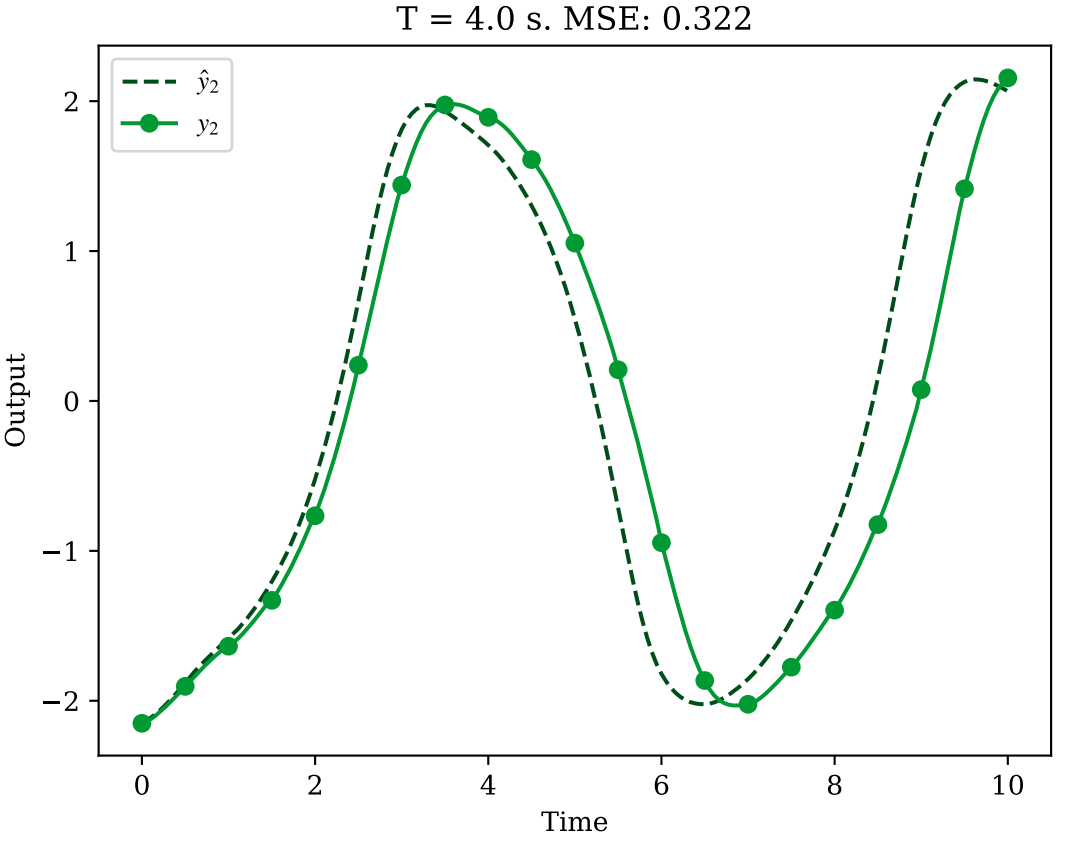

T = 1.0 s. MSE: 0.002
$\hat{y}_1$
$y_1$
Output
Time
3
2
1
0
−1
−2
−3
0
2
4
6
8
10

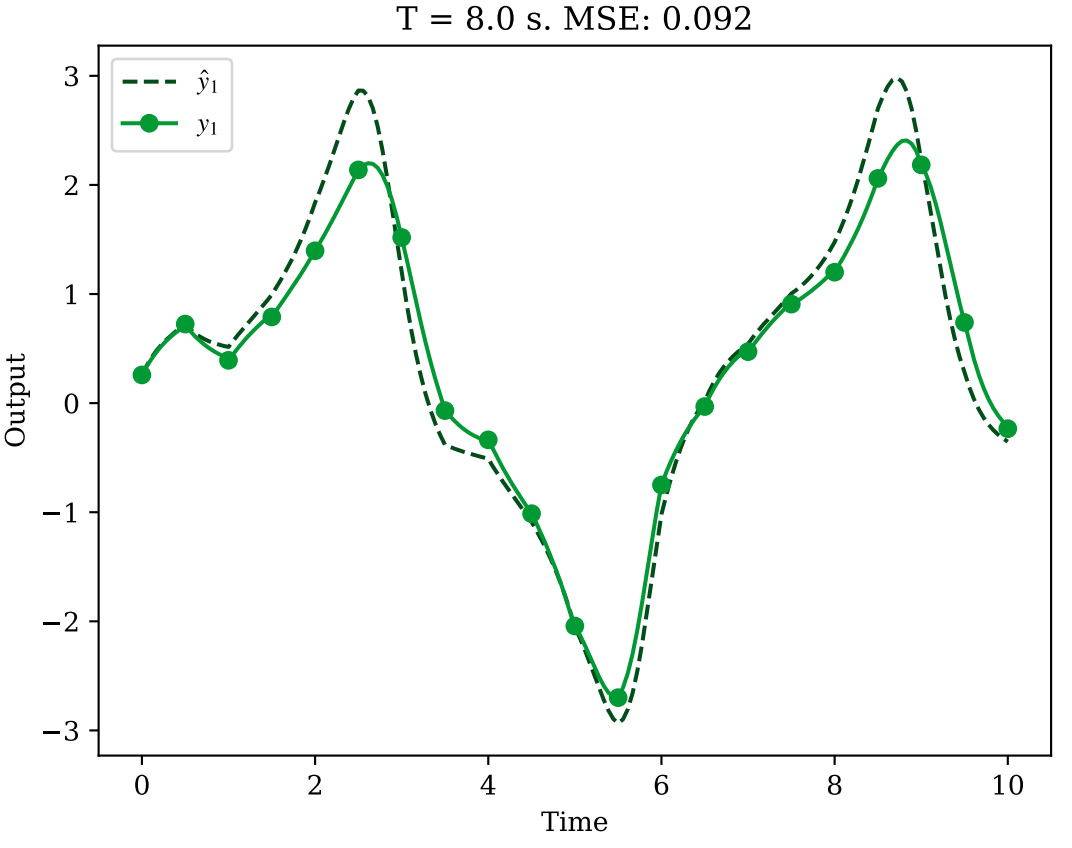

T = 1.0 s. MSE: 0.001
$\hat{y}_2$
$y_2$
Output
Time
2
1
0
−1
−2
0
2
4
6
8
10

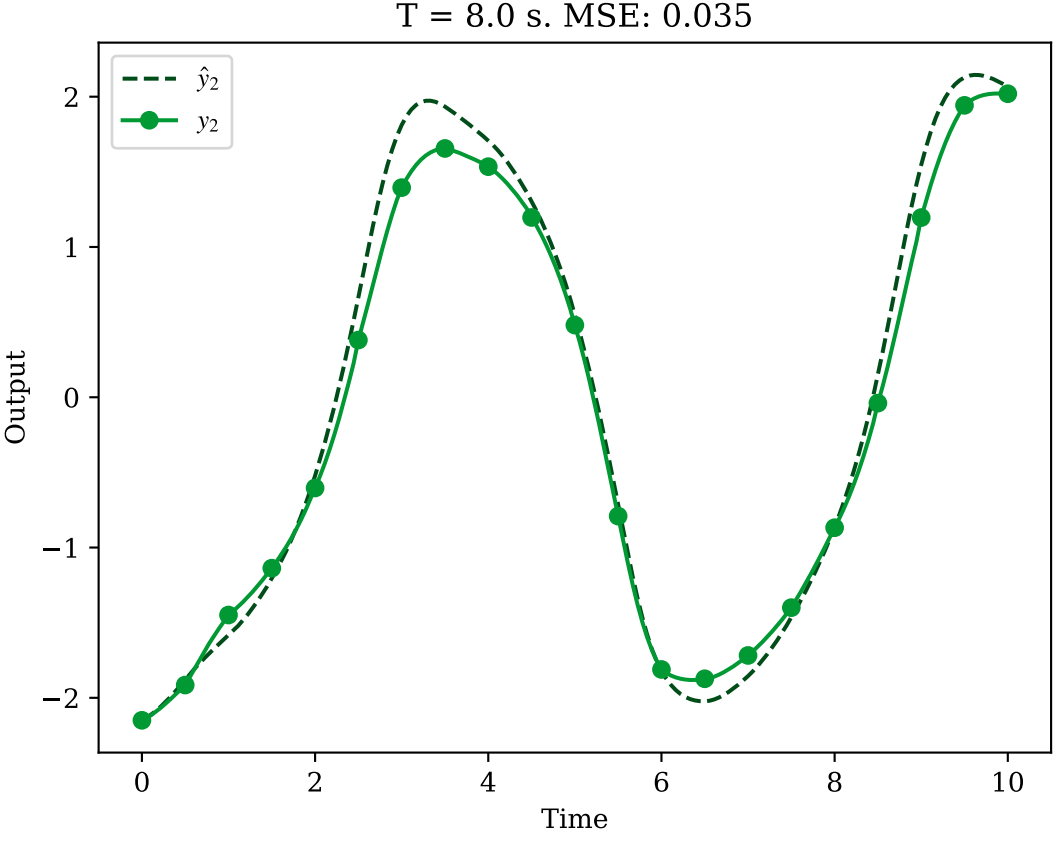

T = 2.0 s. MSE: 0.169
$\hat{y}_1$
$y_1$
Output
Time
3
2
1
0
−1
−2
−3
0
2
4
6
8
10


T = 2.0 s. MSE: 0.081
$\hat{y}_2$
$y_2$
Output
Time
2
1
0
−1
−2
0
2
4
6
8
10


T = 4.0 s. MSE: 0.61
$\hat{y}_1$
$y_1$
Output
Time
3
2
1
0
−1
−2
−3
0
2
4
6
8
10


T = 4.0 s. MSE: 0.322
$\hat{y}_2$
$y_2$
Output
Time
2
1
0
−1
−2
0
2
4
6
8
10


T = 8.0 s. MSE: 0.092
$\hat{y}_1$
$y_1$
Output
Time
3
2
1
0
−1
−2
−3
0
2
4
6
8
10


T = 8.0 s. MSE: 0.035
$\hat{y}_2$
$y_2$
Output
Time
2
1
0
−1
−2
0
2
4
6
8
10