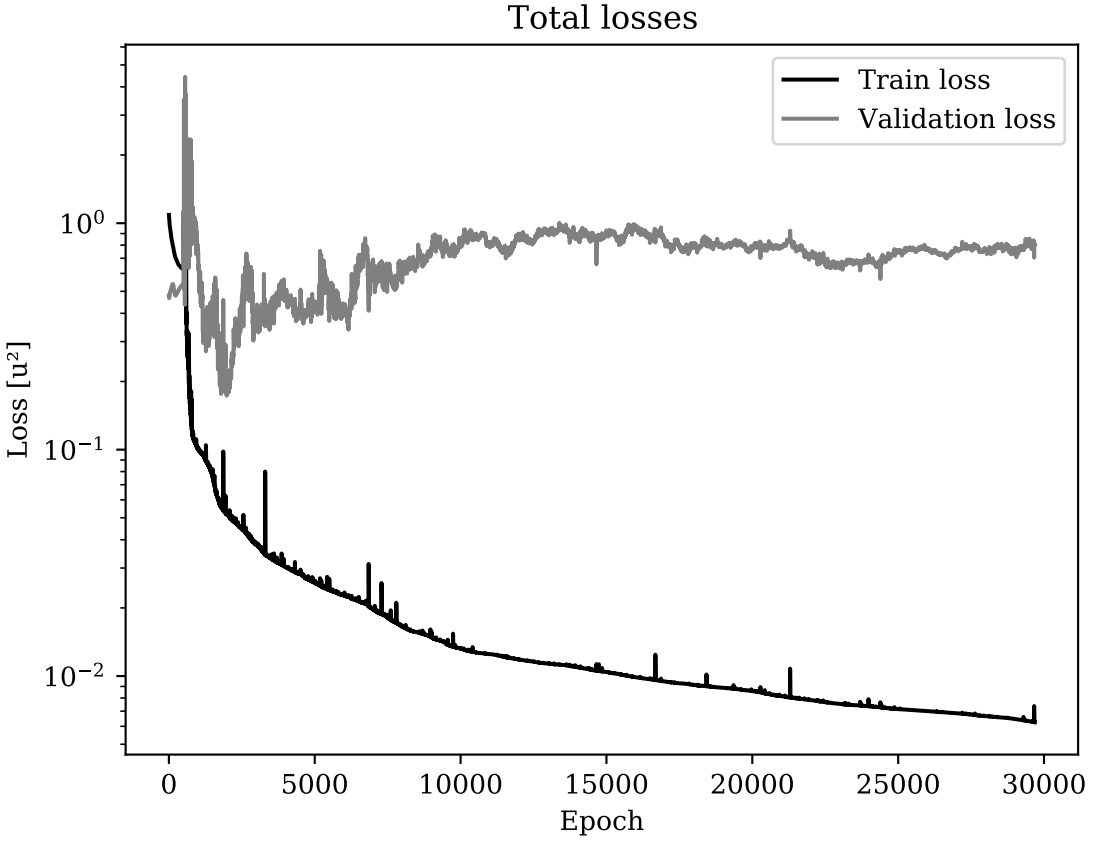
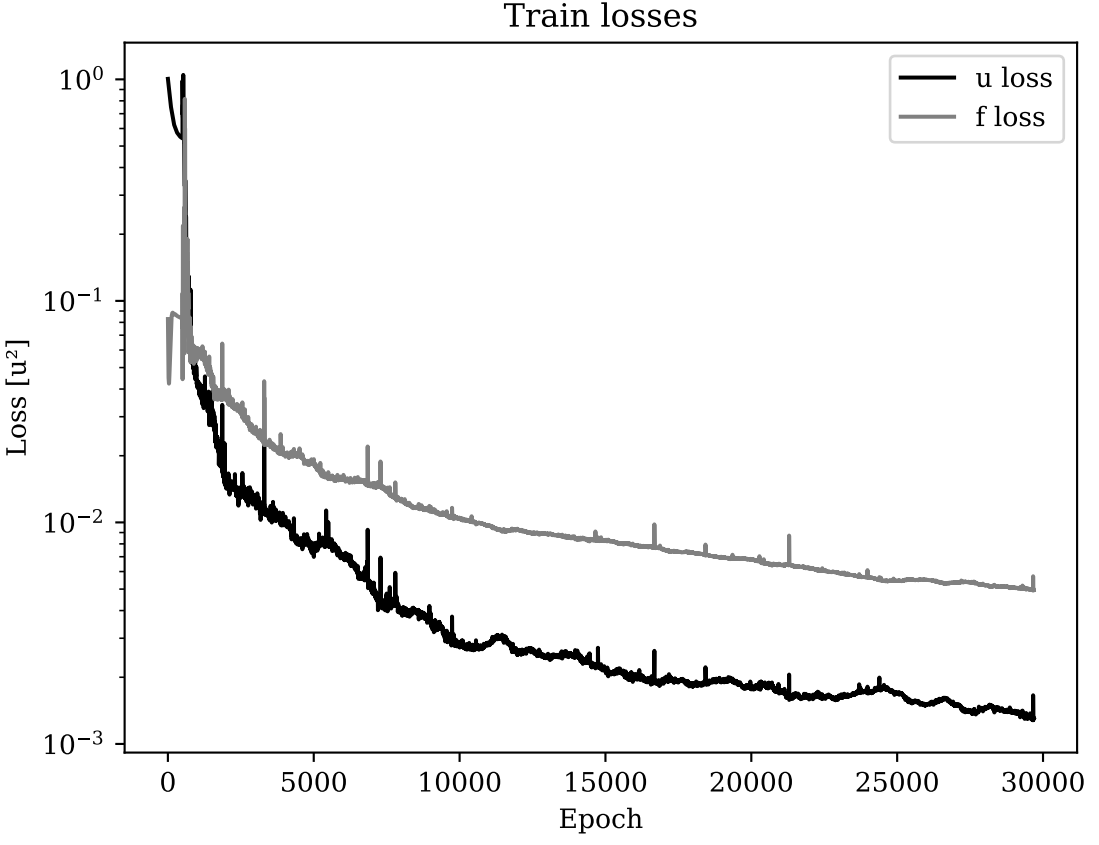
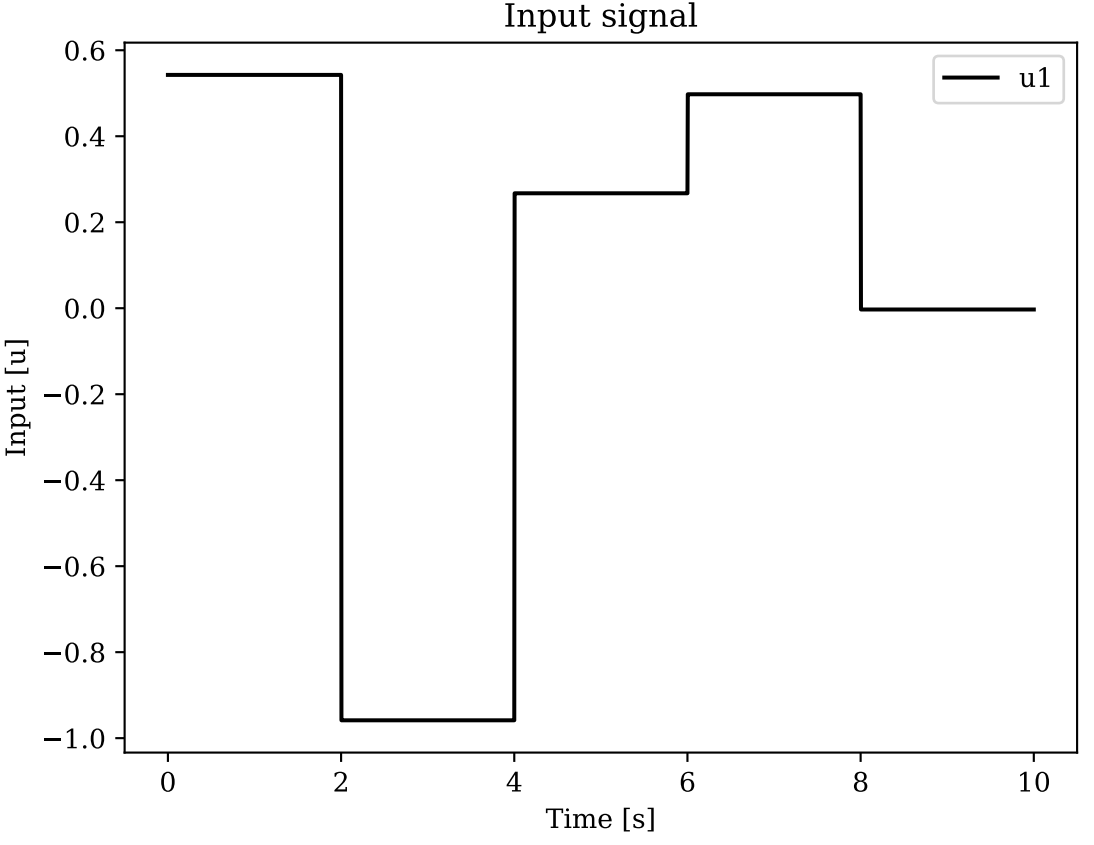
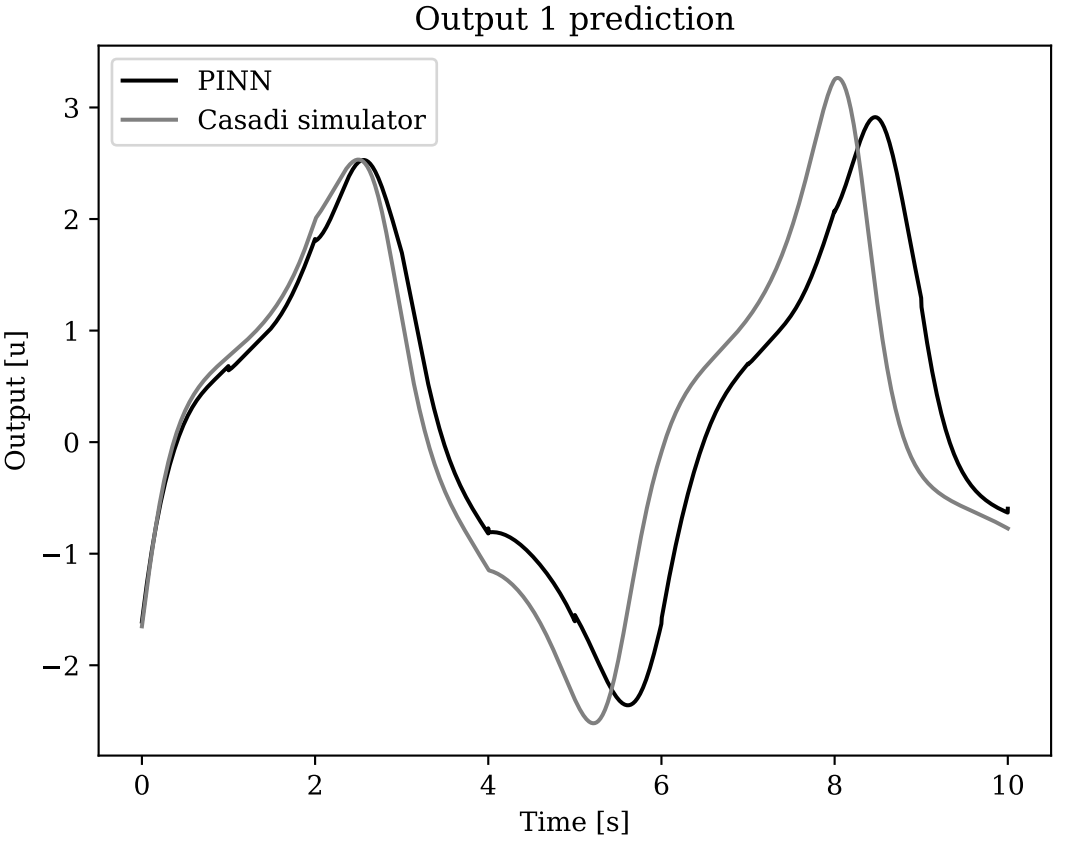
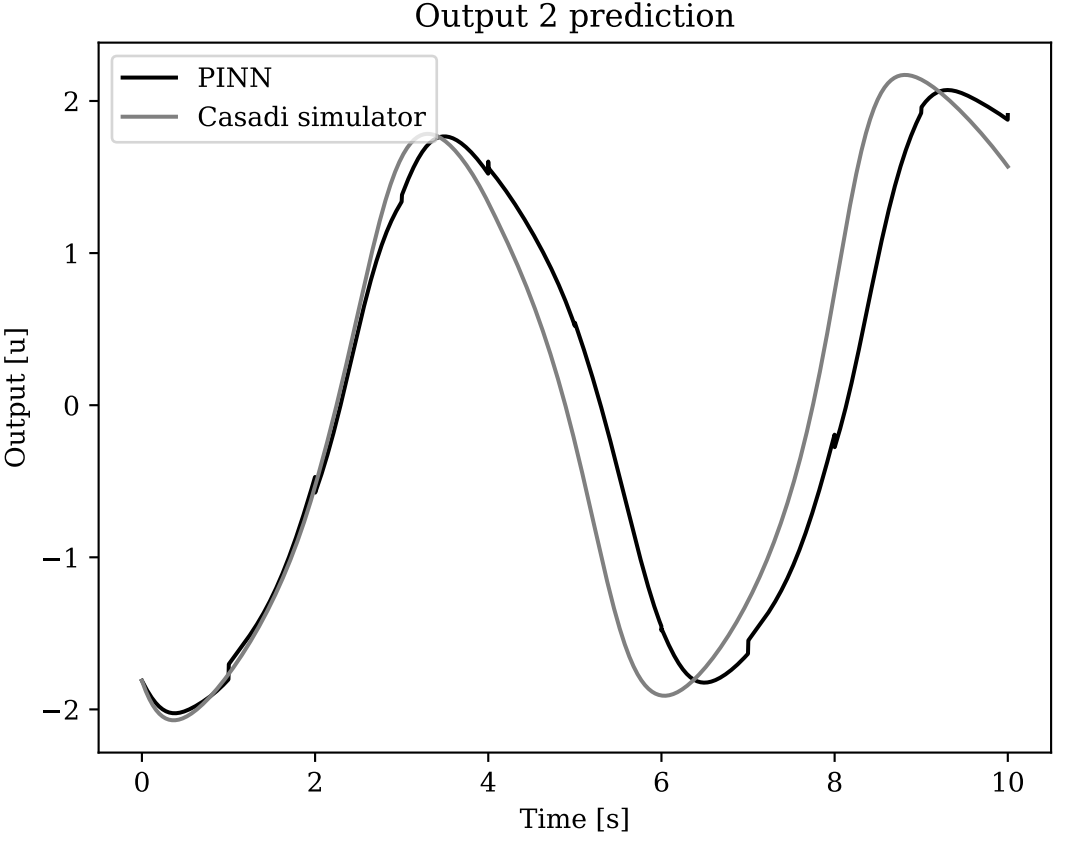
Exhaustion test:
Adam epochs -> 500
L-BFGS iterations -> 10000
Neural network's structure -> 10 hidden layers of 5 neurons
T -> 1.0 s
Train Nu -> 70
Train Nf -> 9940
Validation points -> 9996
Test points -> 9996


Total losses
Train loss
Validation loss
10^0
10^{-1}
10^{-2}
Loss [u²]
0
5000
10000
15000
20000
25000
30000
Epoch


Train losses
u loss
f loss
10^0
10^{-1}
10^{-2}
10^{-3}
Loss [u²]
0
5000
10000
15000
20000
25000
30000
Epoch


Input signal
u1
Input [u]
Time [s]
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
0
2
4
6
8
10


Output 1 prediction
PINN
Casadi simulator
Output [u]
Time [s]
3
2
1
0
−1
−2
0
2
4
6
8
10


Output 2 prediction
PINN
Casadi simulator
Output [u]
Time [s]
2
1
0
−1
−2
0
2
4
6
8
10