Real Results

Torque-limited Simple Pendulum

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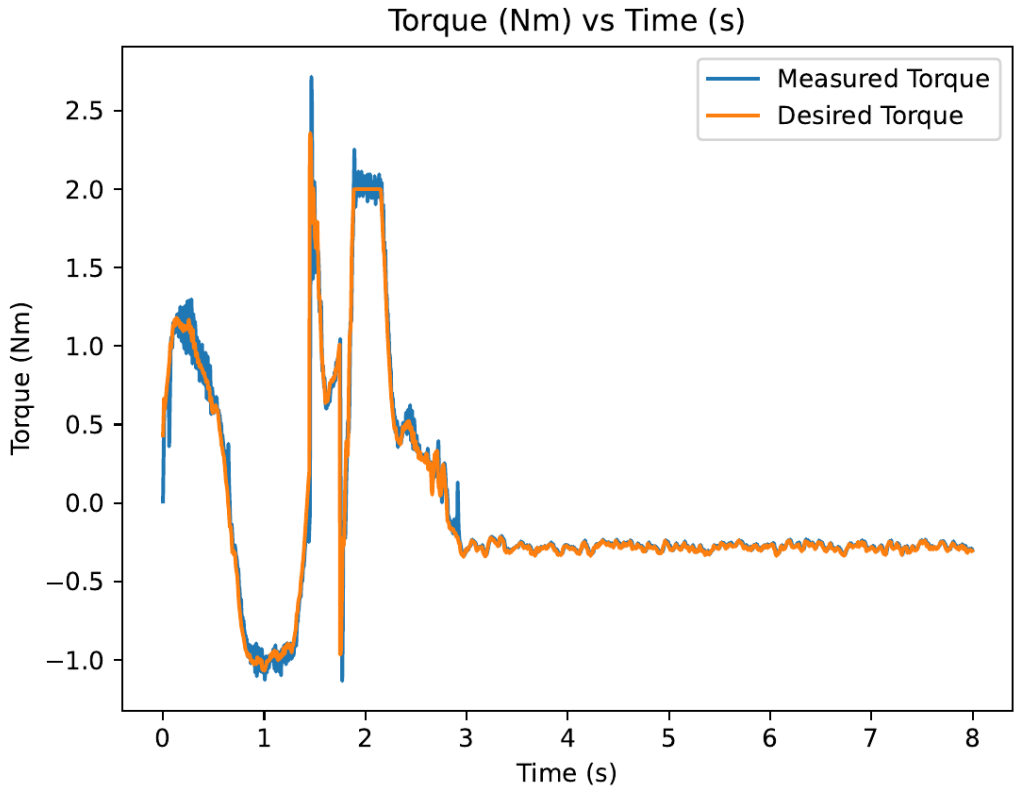
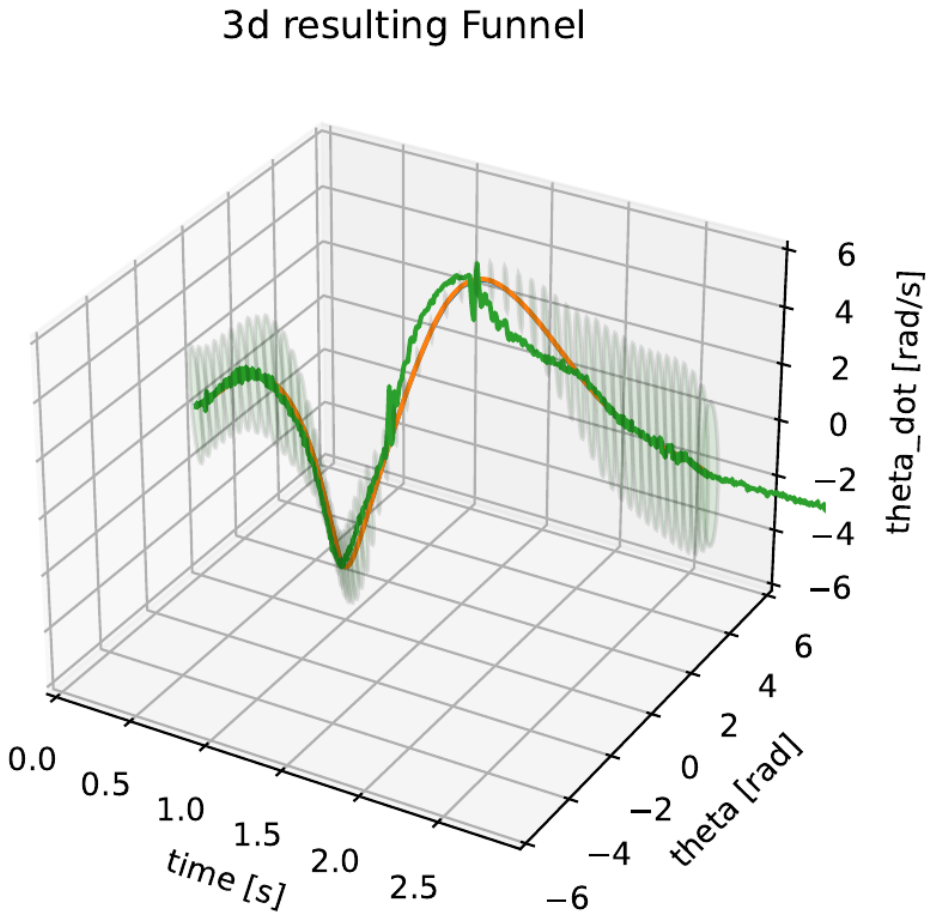
Noisy Dynamics

Disturbance amplitude: 2 Nm

- Initial condition for TVLQR control: $x = [0, 0]$
- Disturbance action: $t \in [1.5,1.7]$
- Result swing-up: Successful



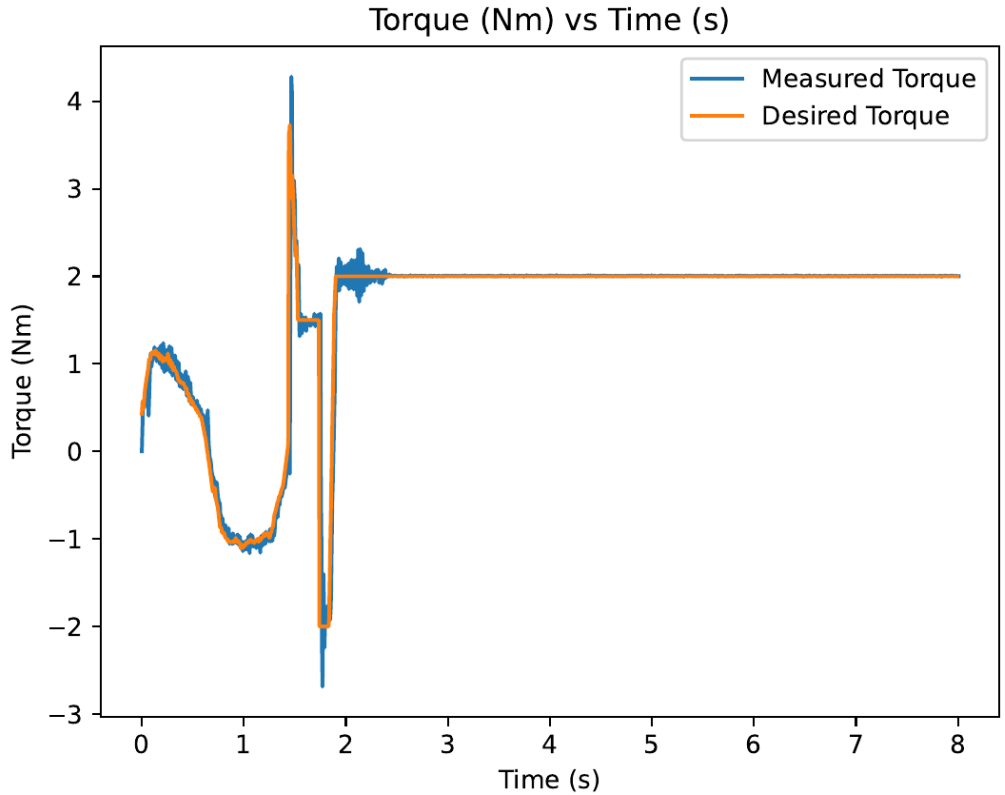
Disturbance amplitude: 2 Nm



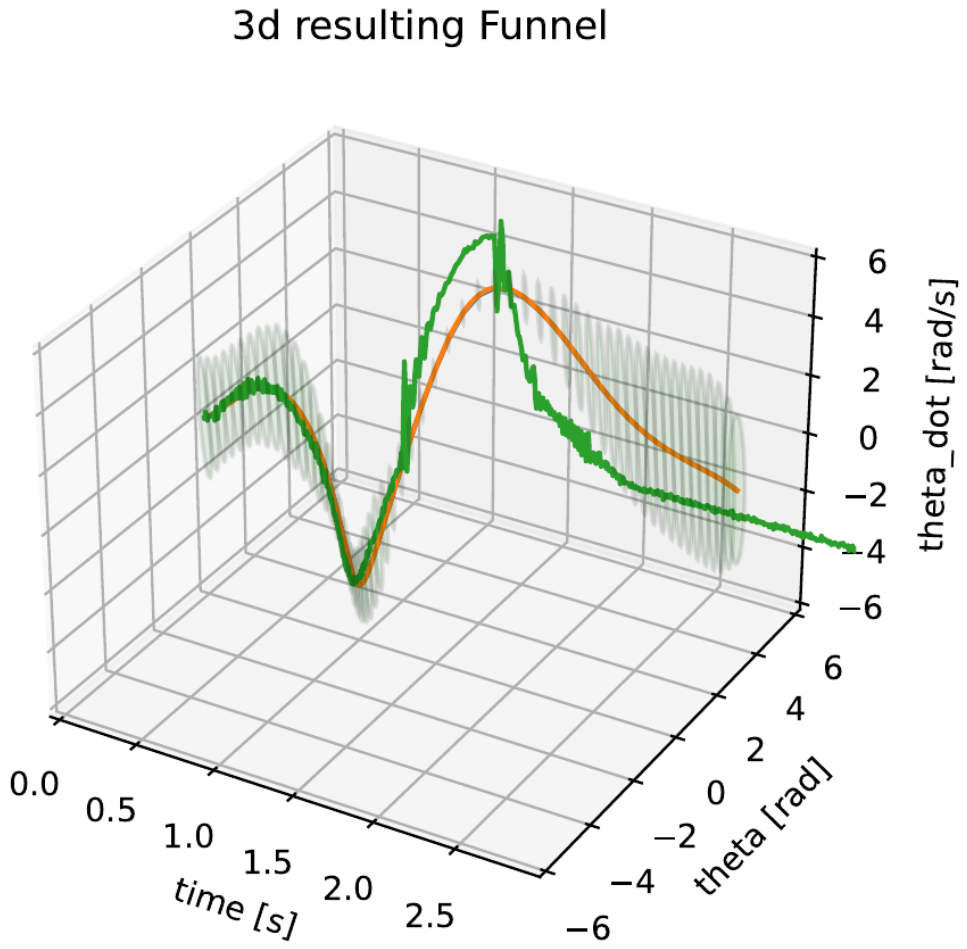
Disturbance amplitude: 2 Nm

Disturbance amplitude: 3.5 Nm

- Initial condition for TVLQR control: x = [0, 0]
- Disturbance action: t ∈ [1.5,1.7]
- Result swing-up: Failure x_f = [2.1,5.5e-03]



Disturbance amplitude: 3.5 Nm

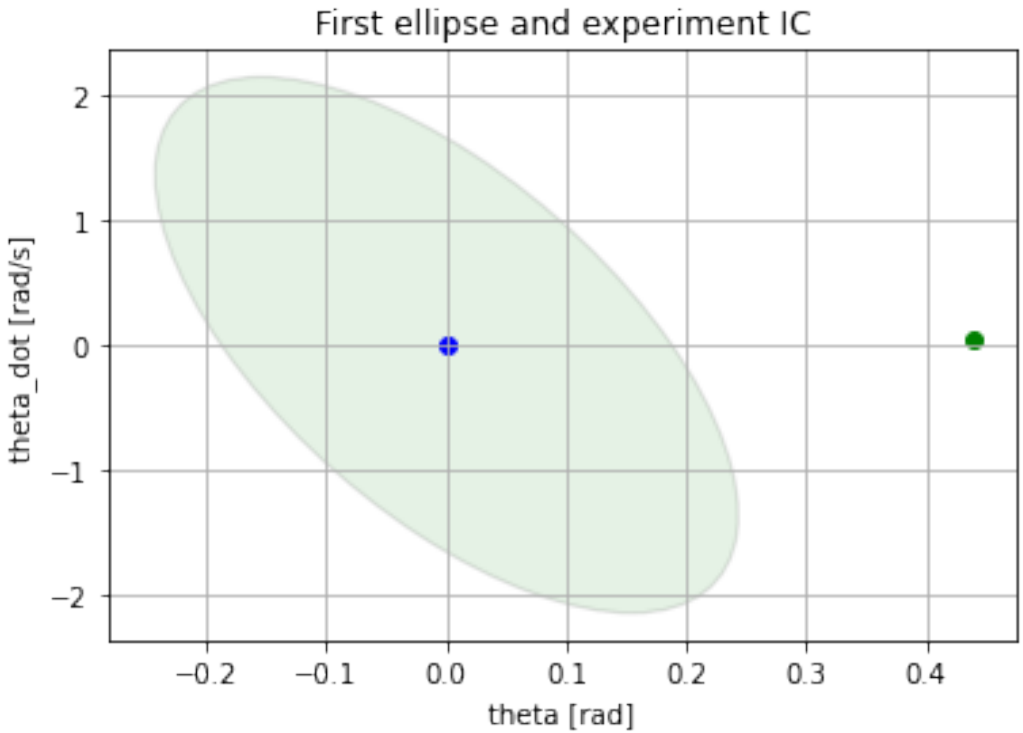


Disturbance amplitude: 3.5 Nm

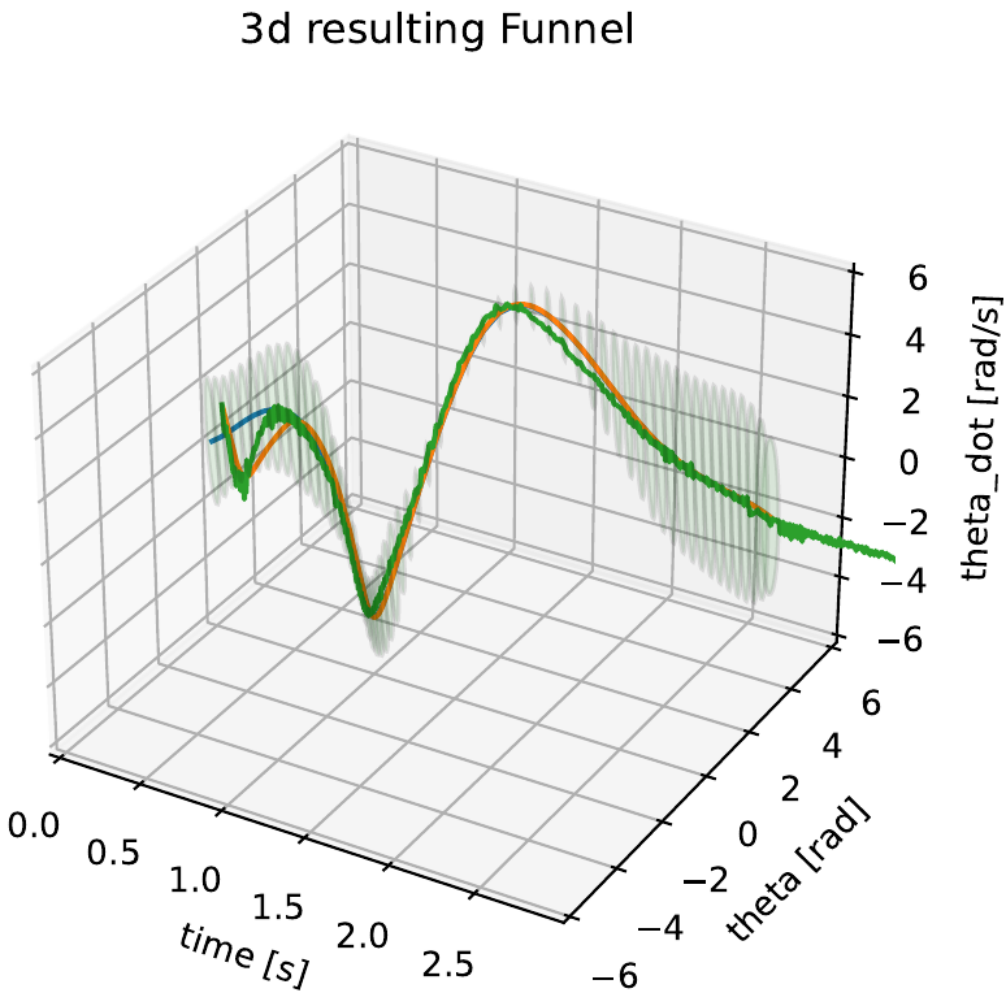
Different Initial Conditions

IC near x = [0,0]

- Initial condition for TVLQR control: x = [4.4e-01,3.8e-02]
- Disturbance action: None
- Result swing-up: Successful



IC near x = [0,0]


3d resulting Funnel
time [s]
0.0
0.5
1.0
1.5
2.0
2.5
theta [rad]
6
4
2
0
−2
−4
−6
theta_dot [rad/s]
6
4
2
0
−2
−4
−6

IC near x = [0,0]