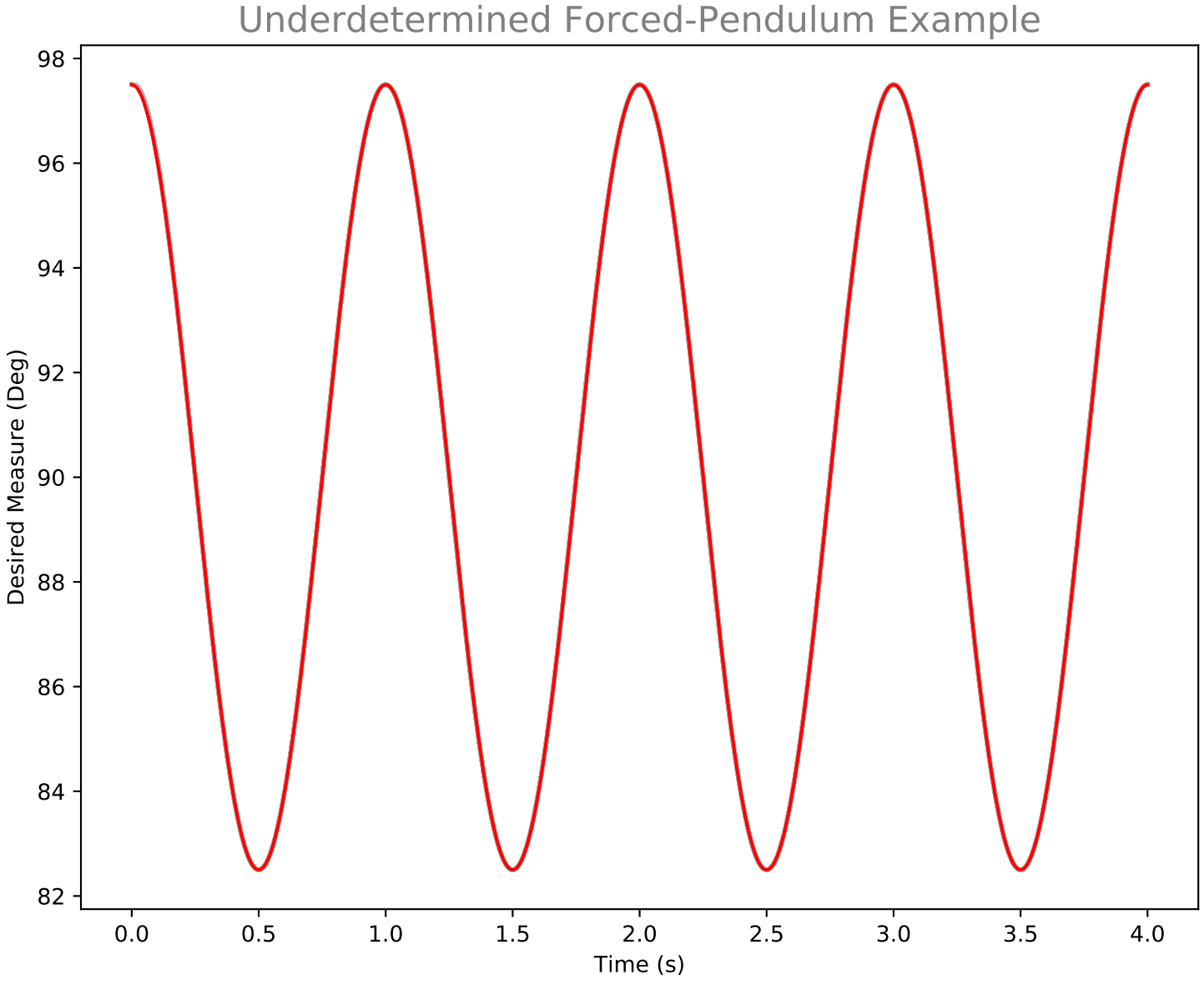
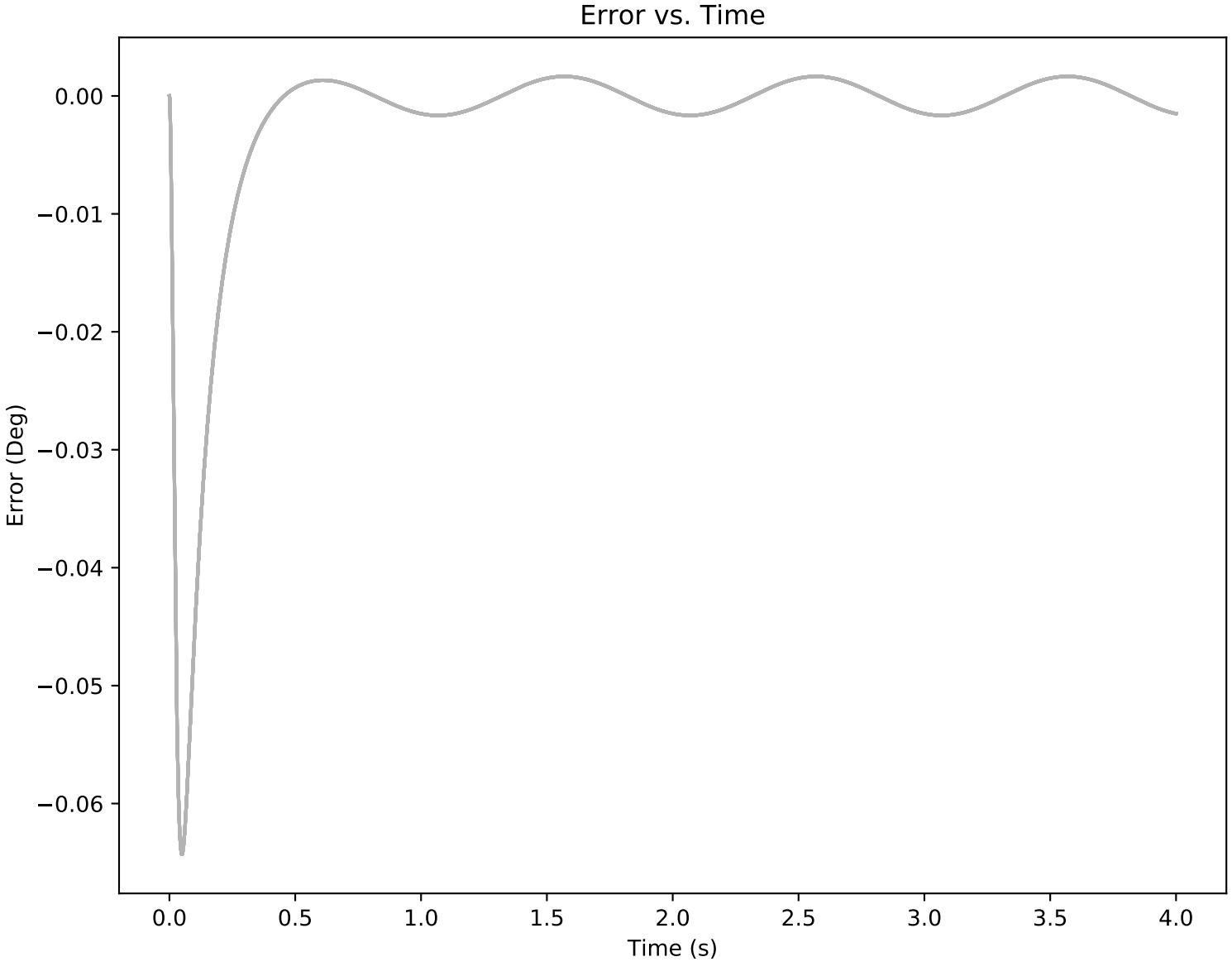
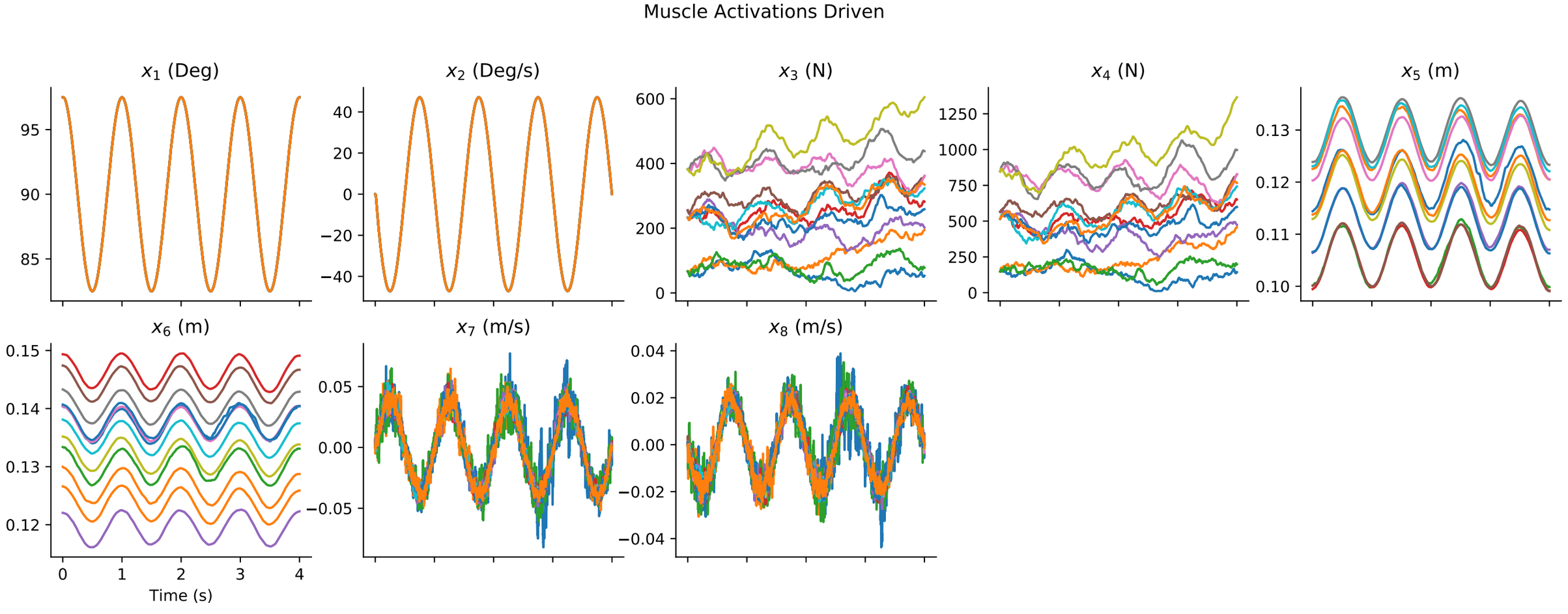
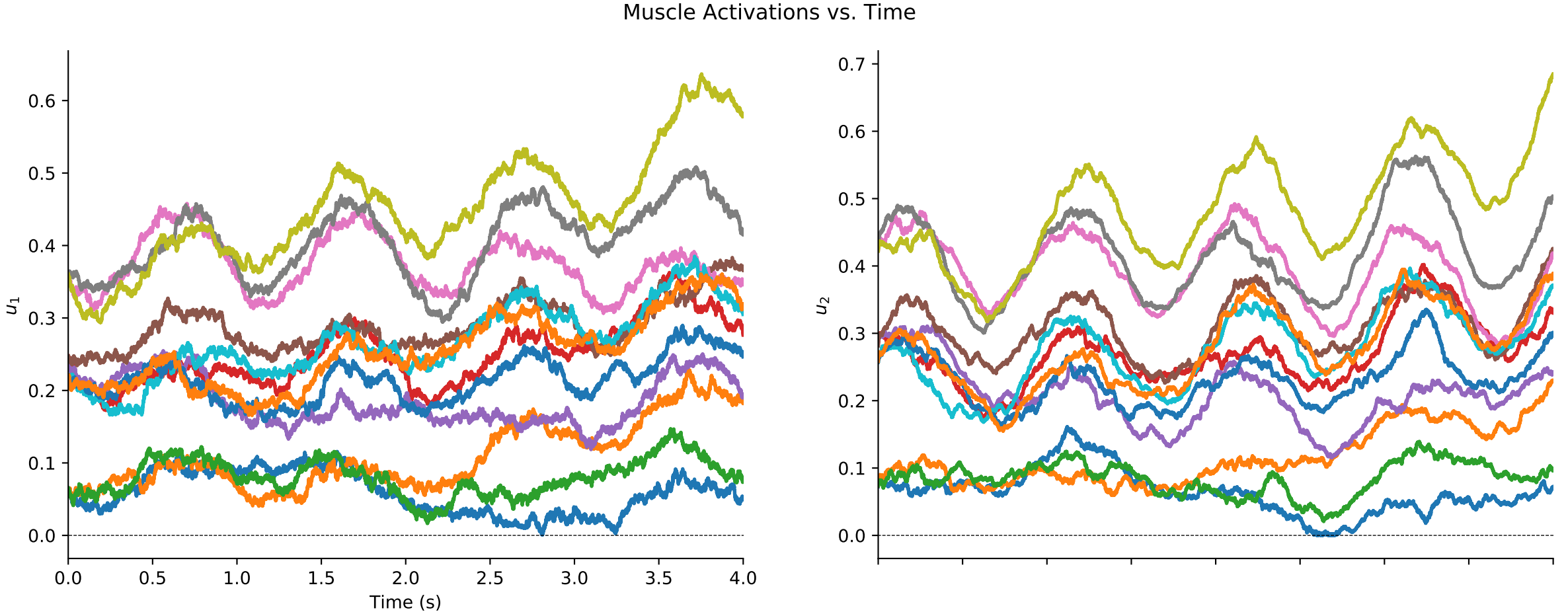
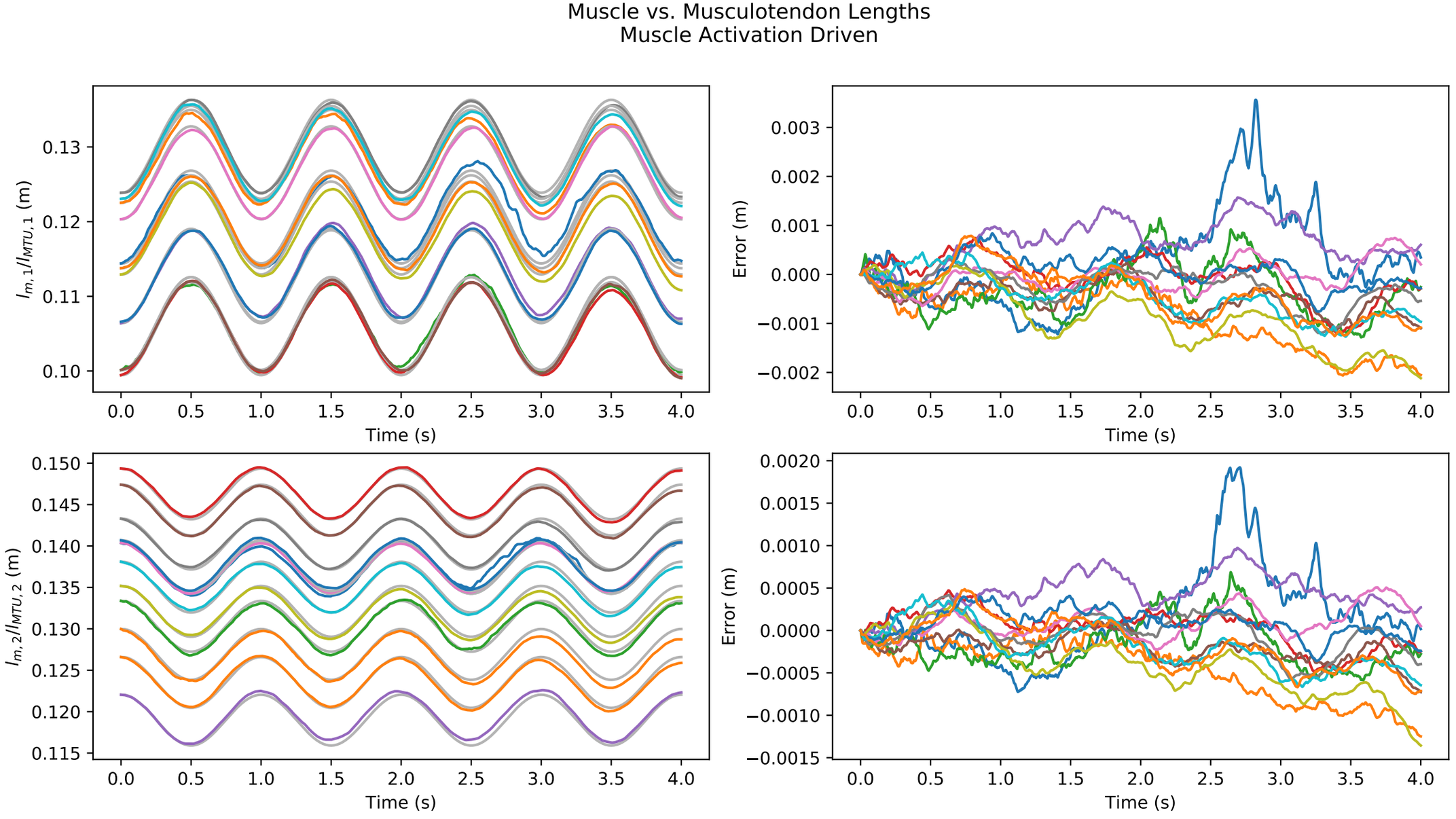

Underdetermined Forced-Pendulum Example
Desired Measure (Deg)
98
96
94
92
90
88
86
84
82
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Time (s)

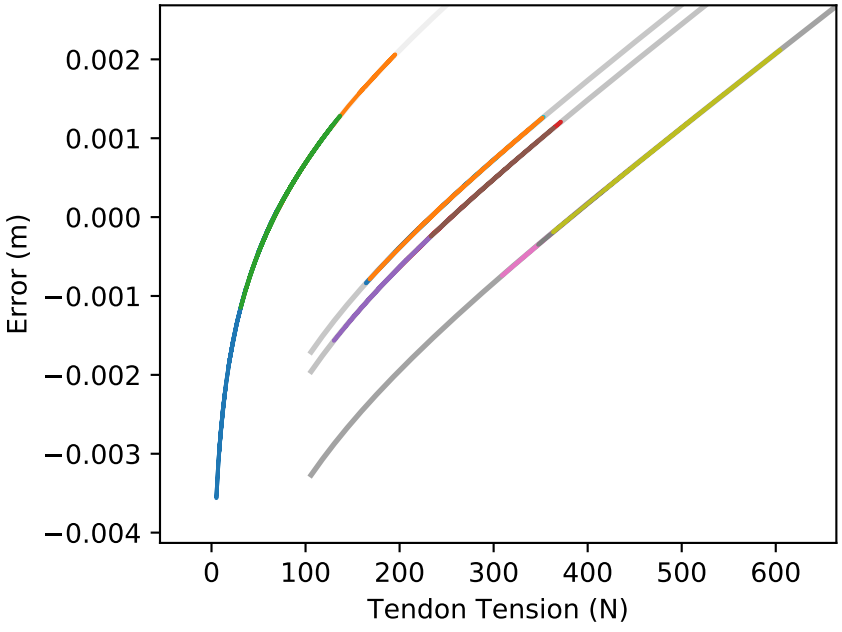

Error vs. Time
0.00
−0.01
−0.02
−0.03
−0.04
−0.05
−0.06
Error (Deg)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Time (s)

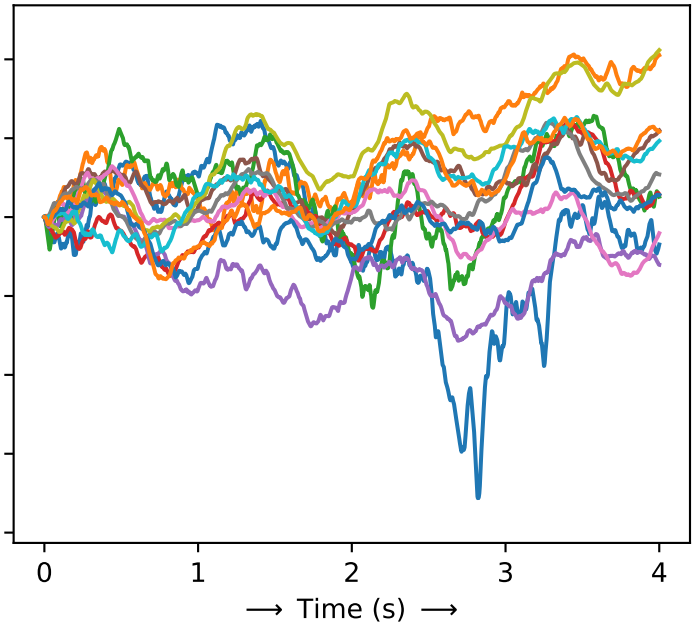

Muscle Activations Driven
x_1 (Deg)
x_2 (Deg/s)
x_3 (N)
x_4 (N)
x_5 (m)
x_6 (m)
x_7 (m/s)
x_8 (m/s)
Time (s)

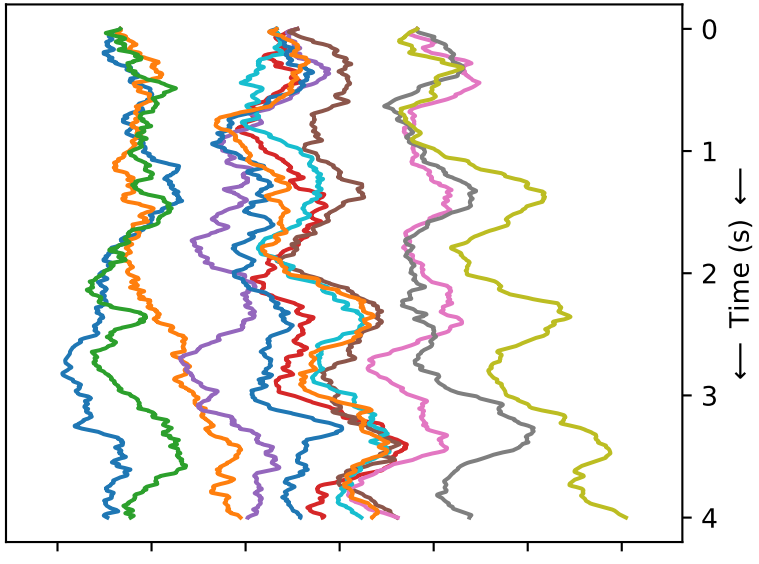

Muscle Activations vs. Time
u_1
u_2
Time (s)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0


Muscle vs. Musculotendon Lengths
Muscle Activation Driven
$l_{m,1}/l_{MTU,1}$ (m)
0.13
0.12
0.11
0.10
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Time (s)
Error (m)
0.003
0.002
0.001
0.000
−0.001
−0.002
Time (s)
$l_{m,2}/l_{MTU,2}$ (m)
0.150
0.145
0.140
0.135
0.130
0.125
0.120
0.115
Time (s)
Error (m)
0.0020
0.0015
0.0010
0.0005
0.0000
−0.0005
−0.0010
−0.0015
Time (s)

Error from MTU Approx vs. Tendon Tension
Muscle 1





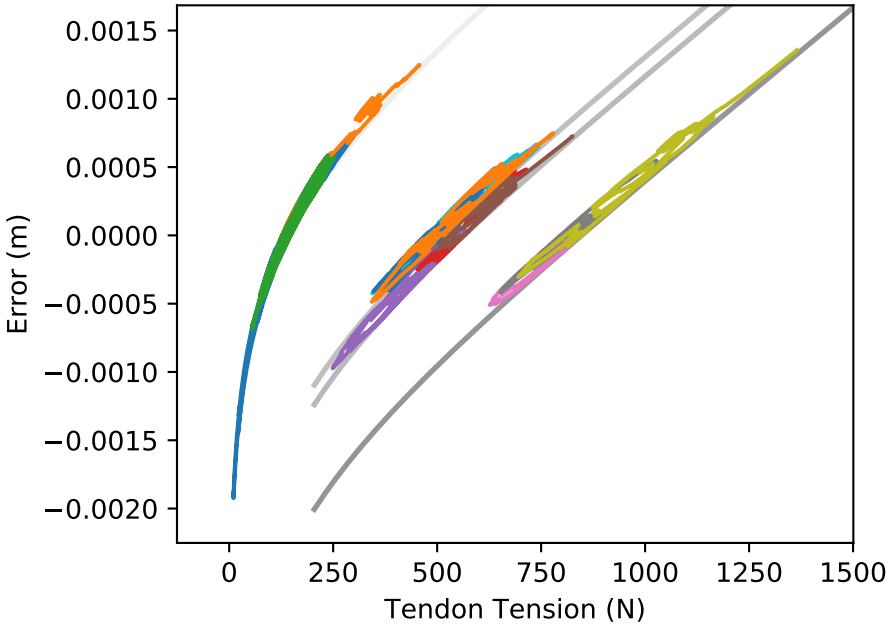


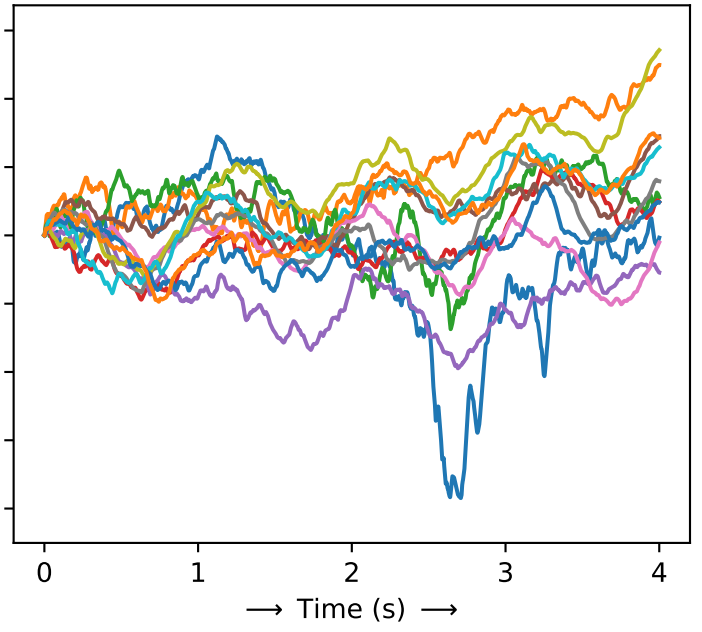
$$\text{error} = \frac{\tau}{\alpha} \cdot \ln\left(\frac{e^{T_1(t)/\tau} - 1}{e^{T_1(0)/\tau} - 1}\right)$$

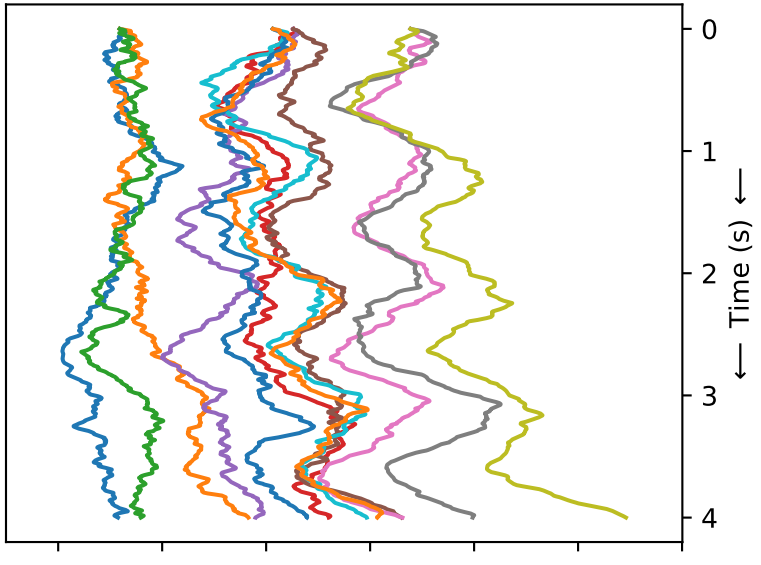
where, $\tau = F_{MAX,1} \cdot c^T \cdot k^T$

and $\alpha = \frac{F_{MAX,1} \cdot c^T}{l_{T_{o,1}}}$

Error from MTU Approx vs. Tendon Tension
Muscle 2







$$\text{error} = \frac{\tau}{\alpha} \cdot \ln\left(\frac{e^{T_2(t)/\tau} - 1}{e^{T_2(0)/\tau} - 1}\right)$$

where, $\tau = F_{MAX,2} \cdot c^T \cdot k^T$

and $\alpha = \frac{F_{MAX,2} \cdot c^T}{l_{T_{o,2}}}$