ECE 413: Senior Project Development II **Spring 2019**

TWIP Measurements
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description	variable	value	units
length of track	d	0.161	m
length to COG	l	0.047	m
radius of a wheel	r	0.04	m
mass of platform	M	1.22	kg
mass of a wheel	M_w	$[0.02, 0.021]$	kg
mass of the pendulum	m	0	kg
moment of inertia of a wheel	I_w	[32e-6, 33.6e-6]	kg-m^2
moment of inertia of the platform and pendulum about z-axis	I_p	[2.601e-3, 4.002e-3]	kg-m^2
moment of inertia of platform about y-axis	I_m	[1.776e-3, 2.056e-3]	kg-m^2
moment of inertia of motor output shaft	J	?	kg-m^2
electromotive force constant	K_e	0.1893	V/rad/sec
motor torque constant	K_t	0.0993	N-m/A
motor friction	b	?	
motor resistance	R	11.1	Ω
motor inductance	L	15.38e-3	H
motor deadzone	d	0.2	V

Notes

- Mass of each battery $\in [0.164\ kg, 0.165\ kg]$
- Mass of all panels $= 0.369\ kg$
- Mass of fusebox $= 0.078\ kg$
- Moment of inertia of platform/pendulum approximated using Parallel Axis Theorem