Cam Design Tutorial Activity

March 13, 2023   12:48 AM

Alex Bartella, 400308868
David Roberts, 400333491
Jacqueline Leung, 400314153

What we're making
- cam for a merry-go-round horse
- flat follower
- rise: harmonic (0 -> 170)
- dwell: 170->190
- fall: uniform (190 -> 360)
- @theta = 170, y = 0.5m
- @theta = 0/360, y = 0m

Table:

phi	0	10	20	30	40	50	60	70	80	90
theta	0	10	20	30	40	50	60	70	80	90
y	0.000	0.004	0.017	0.037	0.065	0.099	0.139	0.182	0.227	0.273

100	110	120	130	140	150	160	170	180
100	110	120	130	140	150	160	170	0
0.318	0.361	0.401	0.435	0.463	0.483	0.496	0.500	0.500

190	200	210	220	230	240	250	260	270	280
0	10	20	30	40	50	60	70	80	90
0.500	0.471	0.441	0.412	0.382	0.353	0.324	0.294	0.265	0.235

290	300	310	320	330	340	350	360
100	110	120	130	140	150	160	170
0.206	0.176	0.147	0.118	0.088	0.059	0.029	0.000

Displacement Profile

Velocity Profile

Acceleration Profile

Cam profile

meters

meters

Rise

Dwell

Fall

0.75m

(0,0)

90° 100° 110° 120° 130° 140° 150° 160° 170° 180° 190° 200° 210° 220° 230° 240° 250° 260° 270° 280° 290° 300° 310° 320° 330° 340° 350° 360° 10° 20° 30° 40° 50° 60° 70° 80°

1.000 0.500 0.000 -0.500 -1.000 -1.500 1.500

-1.5 -1 -0.5 0 0.5 1 1.5
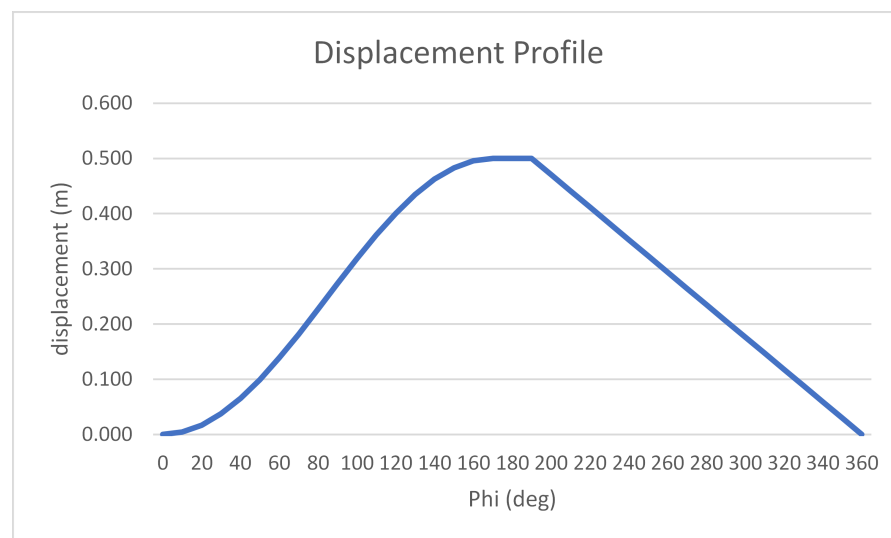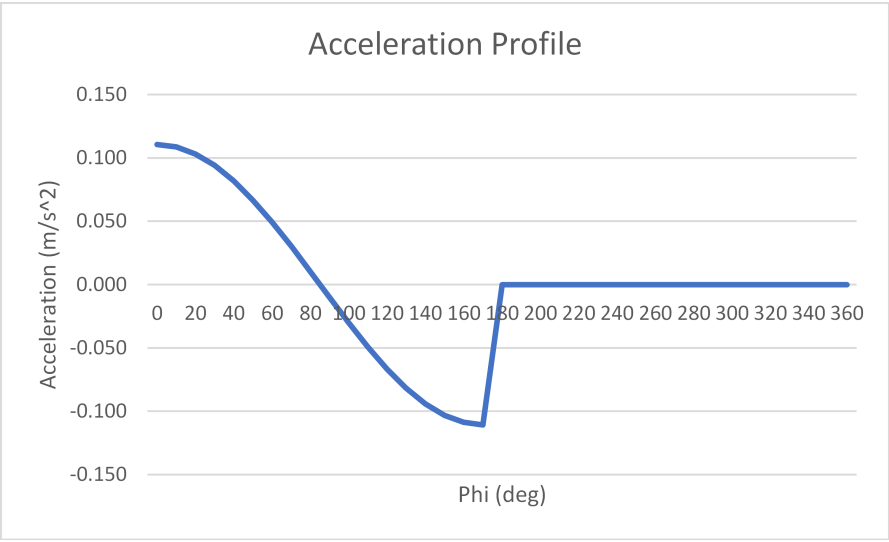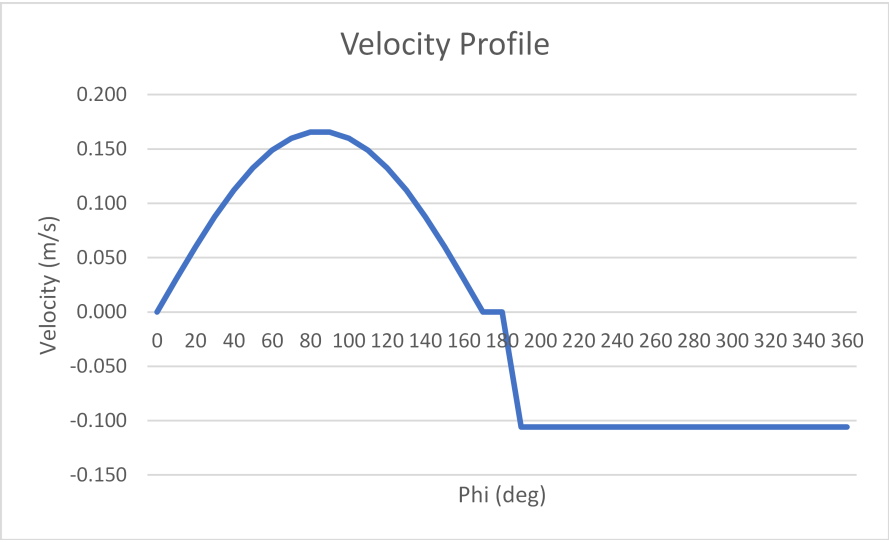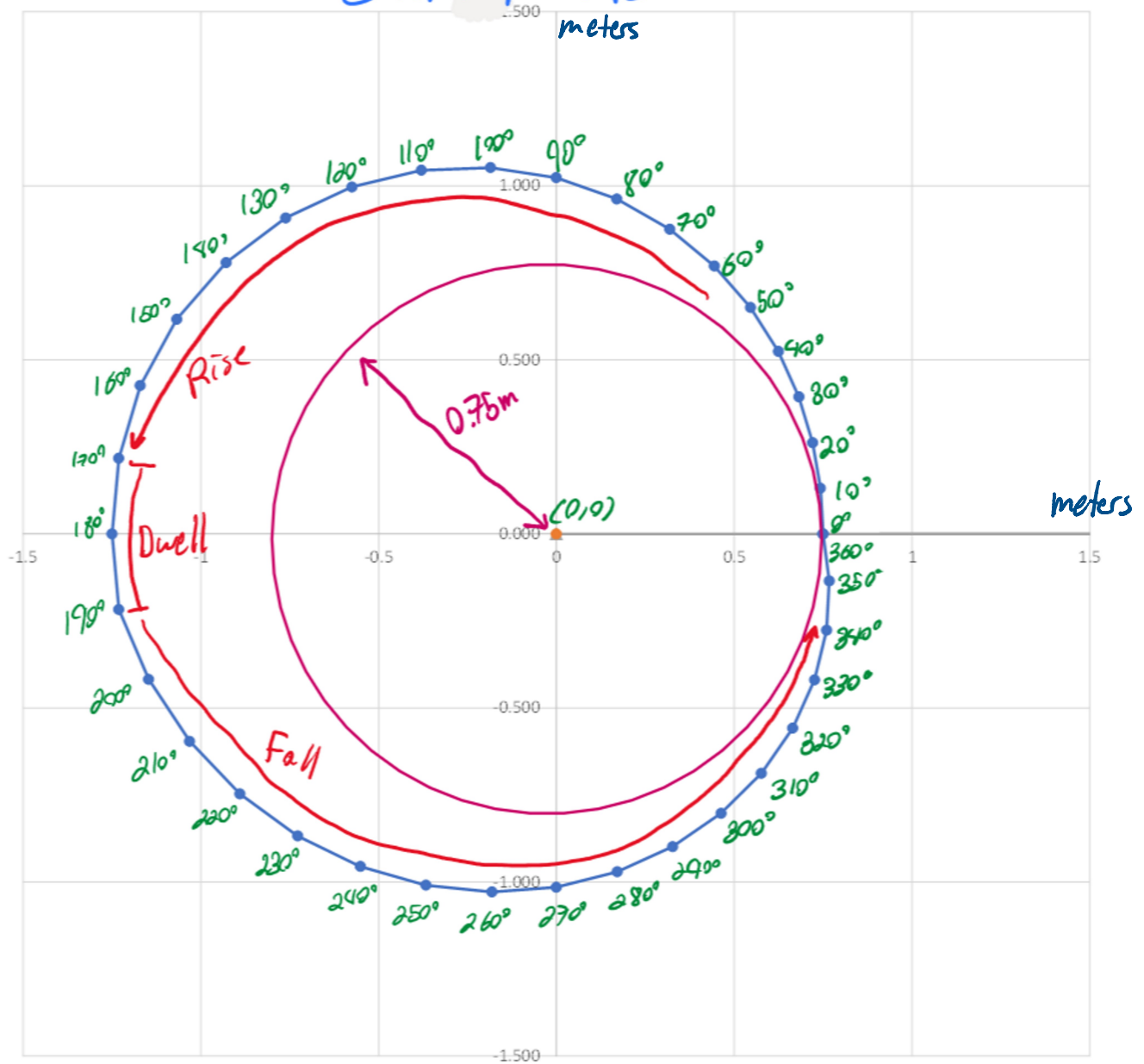
**blue line is cam profile, red is rise and fall, pink is base circle