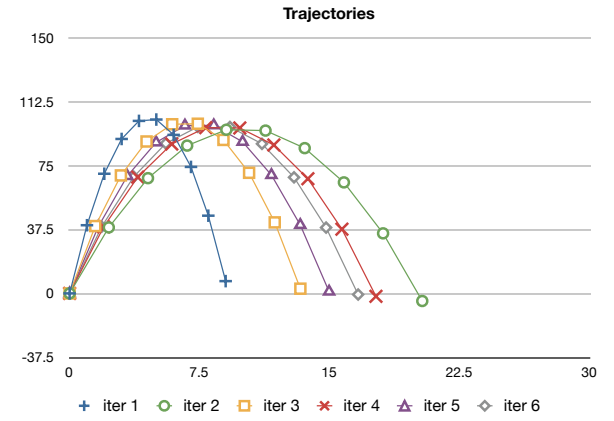


Ballistic Motion with Derivative-based Control

Initial Velocity:	1	40									Target:	16	0
xpos	0	1	2	3	4	5	6	7	8	9	100.84		
ypos	0	40	70.2	90.6	101.2	102	93	74.2	45.6	7.2			
xvel	1	1	1	1	1	1	1	1	1	1			
yvel	40	30.2	20.4	10.6	0.8	-9	-18.8	-28.6	-38.4	-48.2			
dxpos/dc1	0	1	2	3	4	5	6	7	8	9	-126		
dypos/dc1	0	0	0	0	0	0	0	0	0	0			
dxvel/dc1	1	1	1	1	1	1	1	1	1	1			
dyvel/dc1	0	0	0	0	0	0	0	0	0	0			
dxpos/dc2	0	0	0	0	0	0	0	0	0	0	129.6		
dypos/dc2	0	1	2	3	4	5	6	7	8	9			
dxvel/dc2	0	0	0	0	0	0	0	0	0	0			
dyvel/dc2	1	1	1	1	1	1	1	1	1	1			
xpos	0	2.26	4.52	6.78	9.04	11.3	13.56	15.82	18.08	20.34	38.762896		
ypos	0	38.704	67.608	86.712	96.016	95.52	85.224	65.128	35.232	-4.464			
xvel	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26			
yvel	38.704	28.904	19.104	9.304	-0.496	-10.296	-20.096	-29.896	-39.696	-49.496			
dxpos/dc1	0	1	2	3	4	5	6	7	8	9	78.12		
dypos/dc1	0	0	0	0	0	0	0	0	0	0			
dxvel/dc1	1	1	1	1	1	1	1	1	1	1			
dyvel/dc1	0	0	0	0	0	0	0	0	0	0			
dxpos/dc2	0	0	0	0	0	0	0	0	0	0	-80.352		
dypos/dc2	0	1	2	3	4	5	6	7	8	9			
dxvel/dc2	0	0	0	0	0	0	0	0	0	0			
dyvel/dc2	1	1	1	1	1	1	1	1	1	1			
xpos	0	1.4788	2.9576	4.4364	5.9152	7.394	8.8728	10.3516	11.8304	13.3092	14.900457222		
ypos	0	39.50752	69.21504	89.12256	99.23008	99.5376	90.04512	70.75264	41.66016	2.76768			
xvel	1.4788	1.4788	1.4788	1.4788	1.4788	1.4788	1.4788	1.4788	1.4788	1.4788			
yvel	39.50752	29.70752	19.90752	10.10752	0.30752	-9.49248	-19.29248	-29.09248	-38.89248	-48.69248			
dxpos/dc1	0	1	2	3	4	5	6	7	8	9	-48.4344		
dypos/dc1	0	0	0	0	0	0	0	0	0	0			
dxvel/dc1	1	1	1	1	1	1	1	1	1	1			
dyvel/dc1	0	0	0	0	0	0	0	0	0	0			
dxpos/dc2	0	0	0	0	0	0	0	0	0	0	49.81824		
dypos/dc2	0	1	2	3	4	5	6	7	8	9			
dxvel/dc2	0	0	0	0	0	0	0	0	0	0			
dyvel/dc2	1	1	1	1	1	1	1	1	1	1			
xpos	0	1.963144	3.926288	5.889432	7.852576	9.81572	11.778864	13.742008	15.705152	17.668296	5.7277357563		
ypos	0	39.0093376	68.2186752	87.6280128	97.2373504	97.046688	87.0560256	67.2653632	37.6747008	-1.7159616			
xvel	1.963144	1.963144	1.963144	1.963144	1.963144	1.963144	1.963144	1.963144	1.963144	1.963144			
yvel	39.0093376	29.2093376	19.4093376	9.6093376	-0.1906624	-9.9906624	-19.7906624	-29.5906624	-39.3906624	-49.1906624			
dxpos/dc1	0	1	2	3	4	5	6	7	8	9	30.029328		
dypos/dc1	0	0	0	0	0	0	0	0	0	0			
dxvel/dc1	1	1	1	1	1	1	1	1	1	1			
dyvel/dc1	0	0	0	0	0	0	0	0	0	0			
dxpos/dc2	0	0	0	0	0	0	0	0	0	0	-30.8873088		
dypos/dc2	0	1	2	3	4	5	6	7	8	9			
dxvel/dc2	0	0	0	0	0	0	0	0	0	0			
dyvel/dc2	1	1	1	1	1	1	1	1	1	1			
xpos	0	1.66285072	3.32570144	4.98855216	6.65140288	8.3142536	9.97710432	11.63995504	13.30280576	14.96565648	2.2017416247		
ypos	0	39.318210688	68.836421376	88.554632064	98.472842752	98.59105344	88.909264128	69.427474816	40.145685504	1.063896192			
xvel	1.66285072	1.66285072	1.66285072	1.66285072	1.66285072	1.66285072	1.66285072	1.66285072	1.66285072	1.66285072			
yvel	39.318210688	29.518210688	19.718210688	9.918210688	0.118210688	-9.681789312	-19.481789312	-29.281789312	-39.081789312	-48.881789312			
dxpos/dc1	0	1	2	3	4	5	6	7	8	9	-18.61818336		
dypos/dc1	0	0	0	0	0	0	0	0	0	0			
dxvel/dc1	1	1	1	1	1	1	1	1	1	1			
dyvel/dc1	0	0	0	0	0	0	0	0	0	0			
dxpos/dc2	0	0	0	0	0	0	0	0	0	0	19.150131456		
dypos/dc2	0	1	2	3	4	5	6	7	8	9			
dxvel/dc2	0	0	0	0	0	0	0	0	0	0			
dyvel/dc2	1	1	1	1	1	1	1	1	1	1			
xpos	0	1.8490325536	3.6980651072	5.5470976608	7.3961302144	9.245162768	11.09419532	12.943227875	14.792260429	16.641292982	0.8463494805		
ypos	0	39.126709373	68.453418747	87.98012812	97.706837494	97.633546867	87.760256241	68.086965614	38.613674988	-0.659615639			
xvel	1.8490325536	1.8490325536	1.8490325536	1.8490325536	1.8490325536	1.8490325536	1.8490325536	1.8490325536	1.8490325536	1.8490325536			
yvel	39.126709373	29.326709373	19.526709373	9.7267093734	-0.073290627	-9.873290627	-19.67329063	-29.47329063	-39.27329063	-49.07329063			
dxpos/dc1	0	1	2	3	4	5	6	7	8	9	11.543273683		
dypos/dc1	0	0	0	0	0	0	0	0	0	0			
dxvel/dc1	1	1	1	1	1	1	1	1	1	1			
dyvel/dc1	0	0	0	0	0	0	0	0	0	0			
dxpos/dc2	0	0	0	0	0	0	0	0	0	0	-11.8730815		
dypos/dc2	0	1	2	3	4	5	6	7	8	9			
dxvel/dc2	0	0	0	0	0	0	0	0	0	0			
dyvel/dc2	1	1	1	1	1	1	1	1	1	1			



In this example, we controlled a object flying through the air under the influence of gravity. Each iteration, we measure derivatives and update the initial velocity opposite the direction of the gradient.