Examen | Evaluación Módulo 1

Oscar Ortiz Torres A01769292

Implementación de robótica inteligente

Grupo 501

Tecnológico de Monterrey Campus Puebla

Jueves 24 de abril de 2025

Ejercicio 1

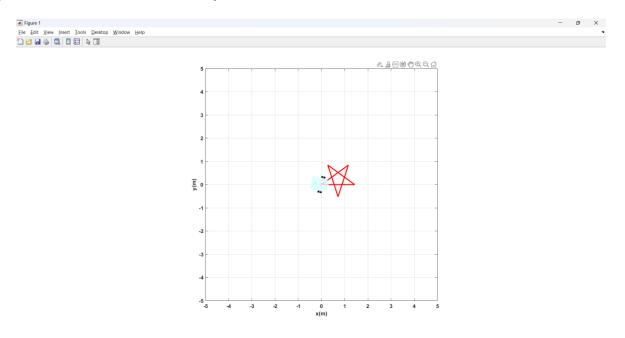
a) Obtener la pose del robot en cada paso de tiempo.

Indice	x_pose	y_pose	th_pose		
0	0	0	0		
1	1.432	0	0		
2	1.432	0	143.98		
3	0.27372	0.84203	143.98		
4	0.27372	0.84203	287.97		
5	0.71548	-0.52013	287.97		
6	0.71548	-0.52013	71.953		
7	1.1591	0.84142	71.953		
8	1.1591	0.84142	215.94		
9	-0.00031834	0.00098158	215.94		
10	-0.00031834	0.00098158	345.52		

b) Calcular la pose final (x, y, θ) del robot tras completar los 10 pasos

Pose final
$$\approx (0,0,345^{\circ})$$

c) Generar la simulación de la trayectoria recorrida en Matlab

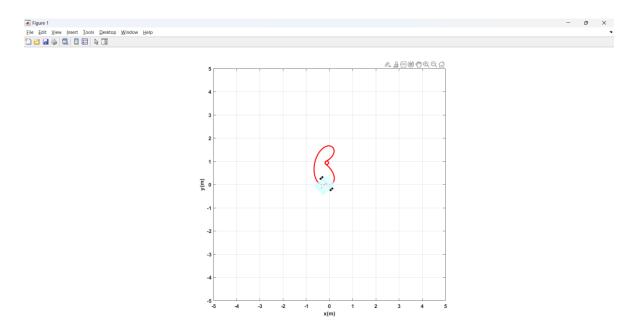


Ejercicio 2

a) Completar la tabla (respuestas en hoja física)

t(s)	v (m/s)	w (rad/s)	w_R (rad/s)	w_L (rad/s)	ж (m)	y (m)	th (°)	
0	NaN	NaN	NaN	NaN	0	0	0	
1	0.17815	0.67222	4.582	1.701	0.13838	0.065172	45.853	
2	0.22418	0.44861	4.773	2.353	0.2066	0.22616	84.368	
3	0.2704	0.30667	5.291	3.676	0.17372	0.44604	110.07	
4	0.3027	0.24222	5.96	4.856	0.040118	0.67992	127.64	
5	0.31418	-4.1397	6.49	5.618	-0.17443	0.89242	141.52	
6	0.3027	-4.1211	-1.168	13.735	-0.042696	0.91818	-95.668	
7	0.2704	0.30667	-1.364	13.472	-0.13415	1.0114	-331.79	
8	0.22418	0.44861	5.96	4.856	0.078472	1.1767	-314.22	
9	0.17815	0.67222	5.291	3.676	0.18991	1.3691	-288.52	
10	0.15707	0.80028	4.773	2.353	0.18177	1.5437	-250	
11	0.17815	0.67222	4.582	1.701	0.073203	1.6515	-204.15	
12	0.22418	0.44861	4.773	2.353	-0.10141	1.6605	-165.63	
13	0.2704	0.30667	5.291	3.676	-0.29678	1.5544	-139.93	
14	0.3027	0.24222	5.96	4.856	-0.47087	1.3489	-122.36	
15	0.31418	0.22361	6.49	5.618	-0.59717	1.0746	-108.48	
16	0.3027	0.24222	6.686	5.881	-0.65932	0.76732	-95.668	
17	0.2704	0.30667	6.49	5.618	-0.64897	0.46553	-81.79	
18	0.22418	0.44861	5.96	4.856	-0.5663	0.20918	-64.219	
19	0.17815	0.67222	5.291	3.676	-0.42364	0.038666	-38.515	
20	0.15707	0.80028	4.773	2.353	-0.25673	-0.013423	1.2563e-13	
21	0.15707	0.80028	4.582	1.701	-0.12929	0.040478	41.267	

b) Generar la simulación de la trayectoria en Matlab



Ejercicio 3

a) Obtener al tabla de entrada ω_R (rad/s) y ω_L (rad/s) requeridas en cada instante de muestreo si se desea obtener una trayectoria circular con un radio de 15 m, cuyo centro sea el origen (0,0)

						58	298.08	301.68						
						59	298.08	301.68	88	298.08	301.68			
			28	298.08	301.68	60	298.08	301.68	89	298.08	301.68			
	2000		29	298.08	301.68	61	298.08	301.68	90	298.08	301.68			
Indice	w_1	w_r	30	298.08	301.68	62	298.08	301.68	91	298.08	301.68			
			31	298.08	301.68				92	298.08	301.68			
1	299.07	300,87	32	298.08	301.68	63	298.08	301.68	93	298.08	301.68			
2	298.53	300.87	33	298.08	301.68	64	298.08	301.68	94	298.08	301.68			
3	298.08	301.23	34	298.08	301.68	65	298.08	301.68	95	298.08	301.68			
4	298.08	301.68	35	298.08	301.68	66	298.08	301.68	96	298.08	301.68			
5	298.08	301.68	36	298.08	301.68	67	298.08	301.68	97	298.08	301.68			
6	298.08	301.68	37	298.08	301.68	68	298.08	301.68	98	298.08	301.68			
7	298.08	301.68	38	298.08	301.68	69	298.08	301.68	99	298.08	301.68			
8	298.08	301.68	39	298.08	301.68	70	298.08	301.68	100	298.08	301.68			
9	298.08	301.68	40	298.08	301.68	71	298.08	301.68	101	298.08	301.68			
10	298.08	301.68	41	298.08	301.68	72	298.08	301.68	102	298.08	301.68			
11	298.08	301.68	42	298.08	301.68	73	298.08	301.68	103	298.08	301.68			
12	298.08	301.68	43	298.08	301.68	74	298.08	301.68	104	298.08	301.68			
13	298.08	301.68	44	298.08	301.68	7.5	298.08	301.68	105	298.08	301.68			
14	298.08	301.68	45	298.08	301.68	76	298.08	301.68	106	298.08	301.68			
15	298.08	301.68	46	298.08	301.68	77	298.08	301.68						
16	298.08	301.68	47	298.08	301.68	78	298.08	301.68		298.08	301.68			
17	298.08	301.68	48	298.08	301.68	79				298.08	301.68			
18	298.08	301.68	49	298.08	301.68		298.08	301.68		298.08	301.68	118	298.08	301.68
19	298.08	301.68	50	298.08	301.68	80	298.08	301.68		298.08		119	298.08	301.68
20	298.08	301.68	51	298.08	301.68	81	298.08	301.68		298.08	301.68	120	298.08	301.68
21 22	298.08 298.08	301.68	52	298.08	301.68	82	298.08	301.68		298.08	301.68	121	298.08	301.68
23	298.08	301.68	53	298.08	301.68	83	298.08	301.68	113	298.08	301.68	122	298.08	301.68
24	298.08	301.68	54	298.08	301.68	84	298.08	301.68	114	298.08	301.68	123	298.08	301.68
25	298.08	301.68	55	298.08	301.68	85	298.08	301.68	115	298.08	301.68	124	298.08	301.68
26	298.08	301.68	56	298.08	301.68	86	298.08	301.68	116	298.08	301.68	125	298.53	301.23
27	298 08	301.68	57	298.08	301.68	87	298.08	301.68	117	298.08	301.68	126	299.07	300.87

b) Generar la simulación en Matlab

