

# Supplementary Materials

Article

## A Study on the Feasibility of Robotic Harvesting for Chile Pepper

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**Table S1: Harvesting Results**

The following table shows all the chile pepper which was in the reachable location for the robot arm. A total 22 chile pepper were not reachable, so the robot did not attempt to harvest those. But as per the metric of performance defined in the paper, those 22 were also considered in total data for the calculation of localization success rate and harvest success rate.

Sr	Chile ID	Diameter (mm)	Location of chile pepper estimated by MATLAB			Value of pitch angle Arduino algorithm solved for (target is 0 for all)	Localized	Harvest	Damage
			x	y	z				
1	1	6.3	163.30	-18.76	274.44	0	0	0	0
2	1	6.3	164.44	-33.19	299.93	0	1	1	0
3	2	7.8	191.14	31.96	268.60	0	1	0	0
4	2	7.8	195.45	28.59	272.35	0	1	1	0
5	3	4.7	150.06	47.22	299.04	0	0	0	0
6	3	4.7	158.35	81.71	297.98	0	1	0	0
7	3	4.7	171.32	68.96	310.95	0	1	1	0
8	4	5.6	203.07	110.02	355.78	21	0	0	0
9	4	5.6	196.03	110.17	356.66	20	0	0	0
10	4R	5.6	154.34	95.72	354.71	15	0	0	0
11	4R	5.6	157.99	96.95	350.46	13	0	0	0
12	4R	5.6	158.62	76.01	346.24	11	0	0	1
13	5	4.7	161.37	-169.39	317.91	5	0	0	0
14	6	4.7	128.55	-116.08	276.00	0	1	1	0
15	7	4.8	96.97	80.97	305.23	0	1	1	0
16	8	5.2	127.63	9.59	313.95	0	1	1	0
17	9	5.1	140.06	-94.42	376.90	24	0	0	0
18	9	5.1	152.77	-107.67	383.68	28	0	0	0
19	9	5.1	164.15	-123.42	379.29	28	0	0	0

20	9R	5.1	145.42	-104.42	383.73	27	1	1	0
21	10	5.4	169.13	-79.77	280.23	0	0	0	0
22	10	5.4	169.13	-79.77	280.23	0	1	1	0
23	11	4.7	103.54	-106.65	373.70	22	1	1	0
24	12	5.2	148.83	-108.97	342.66	10	1	1	0
25	13	4.8	127.97	185.05	305.22	0	0	0	0
26	14	7.3	134.65	93.26	289.98	0	1	0	0
27	15	4.9	143.41	-66.50	264.29	0	0	0	0
28	15	4.9	147.53	-58.65	247.27	0	0	0	0
29	15	4.9	152.16	-62.90	245.71	1	0	0	0
30	15	4.9	152.94	-64.16	237.16	4	1	1	0
31	16	5.3	90.89	-258.23	334.45	21	0	0	0
32	16	5.3	104.66	49.00	324.67	4	1	1	0
33	17	12.8	159.68	12.09	302.67	0	1	1	0
34	18	6.2	82.92	-85.19	392.12	29	0	0	0
35	18	6.2	95.51	-115.20	383.54	26	0	0	0
36	19	5.6	176.97	-147.77	291.93	0	1	1	0
37	20	9	315.75	-16.33	158.46	0	1	0	0
38	20	9	315.75	-16.33	158.46	0	1	0	0
39	20	9	315.75	-16.33	158.46	0	1	0	0
40	20	9	315.75	-16.33	158.46	0	1	0	0
41	20	9	315.75	-16.33	158.46	0	1	0	0
42	20	9	315.75	-16.33	158.46	0	1	1	0
43	21	7	308.28	19.36	125.76	0	1	1	0
44	22	5.2	350.02	111.85	196.42	13	0	0	0
45	22	5.2	350.02	111.85	196.42	13	0	0	0
46	22	5.2	350.02	111.85	196.42	13	0	0	0
47	22	5.2	350.02	111.85	196.42	13	0	0	1
48	23	7	188.56	-47.20	229.79	4	1	0	0
49	23	7	188.56	-47.20	229.79	4	1	0	0
50	23	7	188.56	-47.20	229.79	4	1	0	0
51	23	7	188.56	-47.20	229.79	4	0	0	0
52	23	7	188.56	-47.20	229.79	4	0	0	0
53	23	7	188.56	-47.20	229.79	4	0	1	0
54	24	4.9	164.12	-16.64	185.37	25	1	1	0
55	25	6.7	175.71	29.16	180.11	26	1	1	0

Summary of the results is as follows

	Total Chile Pepper	Local- ized	Har- vested	Dam- aged
In reachable space	55	29	19	2

Not in reachable space	22	0	0	0
<b>Grand Total</b>	<b>77</b>	<b>29</b>	<b>19</b>	<b>2</b>

**Table S2: Chile Pepper 3D Location**

Following is the 3D location data

Sr	X	Y	Z
1	-163.08	-45.93	437.98
2	-139.57	-136.35	384.8
3	-102.43	-147.25	408.8
4	-77.35	-0.68	472.17
5	-75.91	56.32	448.16
6	-65.98	31.29	383.52
7	-56.01	-18.09	425.91
8	-36.74	62.62	338.75
9	-30.08	-73.04	365.1
10	-29.42	18.6	339.94
11	-23.17	-18.02	392.9
12	-0.29	-65.24	406.85
13	5.85	-77.77	286.81
14	11.37	-30.7	340.82
15	15.15	86.6	470.88
16	31.54	-49.21	378.8
17	35.92	-15.03	281.04
18	39.51	-17.38	339.55
19	45.51	18.21	371.22
20	58.2	7.3	408.96
21	59.49	-55.25	387.16
22	66.61	-77.16	338.37
23	73.07	-27.69	401.78
24	82.92	-85.19	392.12
25	86.07	16.82	409.87
26	90.89	-258.23	334.45
27	95.51	-115.20	383.54
28	-83.03	80.97	365.2286
29	-76.58	14.09	467.19
30	-76.46	-106.65	493.70
31	-75.34	49.00	444.67
32	-74.99	18.06	572.66
33	-52.37	9.59	373.9524
34	-52.03	185.05	425.22
35	-51.45	-116.08	336.002
36	-45.35	93.26	409.98

37	-39.94	-94.42	436.9015
38	-36.59	-66.50	384.29
39	-36.31	1.58	465.63
40	-34.58	-104.42	443.7324
41	-32.47	-58.65	367.27
42	-29.94	47.22	359.0359
43	-27.84	-62.90	365.71
44	-27.23	-107.67	443.6764
45	-25.66	95.72	414.7102
46	-22.01	96.95	410.4555
47	-21.65	81.71	357.9807
48	-21.38	76.01	406.2439
49	-20.32	12.09	422.67
50	-18.63	-169.39	377.9138
51	-15.85	-123.42	439.2926
52	-15.56	-33.19	359.9253
53	-10.87	-79.77	400.23
54	-8.68	68.96	370.9483
55	-3.03	-147.77	411.93
56	11.14	31.96	328.6021
57	16.03	110.17	416.6578