

Supplementary Table S1. Location results of images containing adjacent apples

Image number	Apple number	Location of real symmetry axes (°)	Location of symmetry axes (°)	Location error (°)	Runtime (s)
a	1	86.3	86.7	0.4	11.5
	2	87.4	87.8	0.4	
b	3	-57.1	84.8	38.1	3.0
	4	61.6	69.9	8.3	
c	5	-84.1	-44.5	39.6	2.5
	6	76.9	65.3	11.6	
d	7	-67.7	-47.2	20.5	5.0
	8	-85.9	84.0	10.1	
e	9	-79.3	-75.2	4.1	6.6
	10	-55.1	-31.7	23.4	
	11	76.6	41.2	35.4	
	12	85.2	88.7	3.5	
Average				16.3	
RMSE			21.6		

Supplementary Table S2. Location results of apples captured in panorama

Image number	Apple number	Location of real symmetry axes (°)	Location of symmetry axes (°)	Location error (°)	Runtime (s)
a	1	-53.3	-53.3	0.0	4.9
	2	-54.1	-64.9	10.8	
	3	-63.8	-66.1	2.3	
	4	85.6	77.6	8.0	
	5	85.9	80.9	5.0	
	6	-65.6	-71.4	5.8	
	7	-86.9	-57.0	29.9	
	8	87.4	58.8	28.6	
	9	85.8	-89.2	5.0	
b	1	-84.4	-75.8	8.6	5.9
	2	-79.6	-45.0	34.6	
	3	82.7	68.5	14.2	
	4	79.1	-81.4	19.5	
	5	-63.9	-89.5	25.6	
	6	52.5	50.6	1.9	
	7	70.6	69.2	1.4	
c	1	53.8	49.8	4.0	4.6
	2	75.4	76.7	1.3	
	3	51.1	48.5	2.6	
	4	54.9	48.4	6.5	
	5	-87.5	88.0	4.5	
	6	77.7	84.9	7.2	
	7	-86.6	56.6	36.8	
	8	-84.1	-72.9	11.2	
d	1	-62.3	-43.8	18.5	5.4
	2	-66.6	-70.1	3.5	
	3	78.7	76.3	2.4	
	4	82.9	55.3	27.6	
	5	87.0	64.0	23.0	
	6	84.4	49.3	35.1	
	7	-77.0	-50.5	26.5	
e	1	-63.8	-59.0	4.8	8.7
	2	79.4	79.3	0.1	
	3	-85.8	-81.8	4.0	
	4	-82.5	59.5	38.0	
	5	-44.5	-27.5	17.0	
	6	-89.3	-75.1	14.2	
	7	81.4	83.8	2.4	
f	1	-72.0	79.4	28.6	5.0
	2	81.7	70.2	11.5	
	3	-86.0	-50.7	35.3	
	4	78.2	62.4	15.8	
	5	74.7	75.1	0.4	
	6	76.6	44.0	32.6	
	7	32.4	29.8	2.6	
Average				13.8	
RMSE			18.4		