	observations			no	drop dur.	flipped	sticky	board	cam	qualitative	new	time	computations				
exp#	*corner x*	*corner y*	*27.8–intercept*	pickup	rotation	@ release	release	crash	failure	observations	sheet		slope	angle (deg)	dx	dy	x0
1	0.7	–1.7	–3.0									7:08	–0.048	–2.751	–0.518	10.783	1.218
2					1								0.000	0.000	0.000	10.795	0.000
3	5.4	–1.5	4.5										0.268	15.725	2.926	10.391	2.474
4	1.1	–1.6	–2.7								W		–0.041	–2.362	–0.445	10.786	1.545
5	0.1	–1.4	–6.7										–0.191	–11.098	–2.078	10.593	2.178
6					1								0.000	0.000	0.000	10.795	0.000
7	1.2	–1.8	–1.8					1		board crash didn't affect experiment			0.000	0.000	0.000	10.795	1.200
8	1.0	–2.0	–1.6										0.015	0.855	0.161	10.794	0.839
9	1.3	–2.0	–2.0										0.000	0.000	0.000	10.795	1.300
10					1				1				0.000	0.000	0.000	10.795	0.000
11	0.9	–1.8	–1.7								W		0.004	0.213	0.040	10.795	0.860
12	–0.2	–1.6	–6.3										–0.168	–9.709	–1.820	10.640	1.620
13					1								0.000	0.000	0.000	10.795	0.000
14					1								0.000	0.000	0.000	10.795	0.000
15					1								0.000	0.000	0.000	10.795	0.000
16					1								0.000	0.000	0.000	10.795	0.000
17	0.3	–1.9	–2.1							began putting paper @0.0,–2.0 (no gap)			–0.007	–0.417	–0.079	10.795	0.379
18	0.8	–1.8	–1.7										0.004	0.212	0.040	10.795	0.760
19	1.9	–1.5	–1.2										0.012	0.664	0.125	10.794	1.775
20	0.1	–1.8	–4.0									7:25	–0.079	–4.560	–0.858	10.761	0.958
21	2.1	–1.8	3.1		1								0.191	11.058	2.071	10.595	0.029
22	1.8	–2.0	–1.8										0.008	0.441	0.083	10.795	1.717
23	1.2	–1.7	–1.7										0.000	0.000	0.000	10.795	1.200
24	1.4	–1.8	–1.2								W		0.023	1.302	0.245	10.792	1.155
25	0.3	–1.8	–1.7										0.004	0.208	0.039	10.795	0.261
26	1.4	–2.1	1.0						1				0.117	6.759	1.271	10.720	0.129
27					1								0.000	0.000	0.000	10.795	0.000
28	0.7	–2.0	–2.0										0.000	0.000	0.000	10.795	0.700
29	1.2	–1.5	1.1										0.098	5.618	1.057	10.743	0.143
30	0.7	–1.5	–1.7										–0.007	–0.423	–0.080	10.795	0.780
31	0.3	–1.5	–1.4										0.004	0.208	0.039	10.795	0.261
32	0.4	–1.7	–1.7										0.000	0.000	0.000	10.795	0.400
33	0.7	–1.4	–1.4										0.000	0.000	0.000	10.795	0.700
34	0.7	–1.4	–1.6								W		–0.007	–0.423	–0.080	10.795	0.780
35	1.3	–1.7	–1.4										0.011	0.649	0.122	10.794	1.178
36	0.3	–2	–2.1										–0.004	–0.208	–0.039	10.795	0.339
37	1.0	–1.8	–0.9										0.034	1.925	0.363	10.789	0.637

38						1							0.000	0.000	0.000	10.795	0.000
39					1								0.000	0.000	0.000	10.795	0.000
40	0.2	−1.8	−2.1										−0.011	−0.623	−0.117	10.794	0.317
41	0.3	−1.8	−2.1										−0.011	−0.625	−0.118	10.794	0.418
42	1.2	−1.8	−1.7										0.004	0.215	0.041	10.795	1.159
43	0.5	−1.1	−2.2									7:40	−0.040	−2.310	−0.435	10.786	0.935
44	0.2	−1	−3.6								W		−0.094	−5.413	−1.018	10.747	1.218
45	0.9	−2	−2										0.000	0.000	0.000	10.795	0.900
46	1.0	−1.9	−1.6										0.011	0.641	0.121	10.794	0.879
47	1.4	−2.2	−1.9										0.011	0.651	0.123	10.794	1.277
48	0.8	−1.8	−1.9										−0.004	−0.212	−0.040	10.795	0.840
49	0.9	−1.7	−1.4										0.011	0.639	0.120	10.794	0.780
50	1.0	−2.1	−1.8										0.011	0.641	0.121	10.794	0.879
51	0.7	−1.7	0.2										0.070	4.024	0.757	10.768	−0.057
52	1.0	−1.9	−1.8										0.004	0.214	0.040	10.795	0.960
53	−0.3	−1.8	−9.5			1							−0.274	−16.105	−2.995	10.371	2.695
54	0.2	−1.6	−2.1								W		−0.018	−1.038	−0.196	10.793	0.396
55	0.9	−1.7	0.2										0.071	4.054	0.763	10.768	0.137
56	0.8	−1.7	−1.1										0.022	1.273	0.240	10.792	0.560
57					1								0.000	0.000	0.000	10.795	0.000
58	0.3	−1.3	−1										0.011	0.625	0.118	10.794	0.182
59	0.4	−1.4	−0.8							robot origin = −0.2,1.0			0.022	1.255	0.236	10.792	0.164
60									1	never detached			0.000	0.000	0.000	10.795	0.000
61					1								0.000	0.000	0.000	10.795	0.000
62	0.8	−1.8	1.4										0.119	6.823	1.282	10.719	−0.482
63	0.2	−1.7	−1.1										0.022	1.246	0.235	10.792	−0.035
64											W		0.000	0.000	0.000	10.795	0.000
65	0.8	−1.8	1.7										0.130	7.469	1.403	10.703	−0.603
66	0.9	−1.4	0.6										0.074	4.268	0.803	10.765	0.097
67				1									0.000	0.000	0.000	10.795	0.000
68				1									0.000	0.000	0.000	10.795	0.000
69				1						orig @ 0,1			0.000	0.000	0.000	10.795	0.000
70				1									0.000	0.000	0.000	10.795	0.000
71				1									0.000	0.000	0.000	10.795	0.000
72					1								0.000	0.000	0.000	10.795	0.000
73					1							7:56	0.000	0.000	0.000	10.795	0.000
74	0.2	−1.7	−1.2								W		0.018	1.038	0.196	10.793	0.004
75	0.4	−1.5	−0.4										0.040	2.301	0.433	10.786	−0.033
76	0.8	−1.4	−0.1										0.048	2.761	0.520	10.782	0.280
77	0.8	−1.3	−0.1										0.044	2.548	0.480	10.784	0.320

78					1								0.000	0.000	0.000	10.795	0.000
79	3.7	–0.3	9.2		1								0.394	23.833	4.362	9.874	–0.662
80	2.3	–1.4	4.6		1								0.235	13.736	2.563	10.486	–0.263
81					1								0.000	0.000	0.000	10.795	0.000
82	0.7	–1.5	0.3										0.066	3.811	0.718	10.771	–0.018
83				1						it's twisty! tightened screw, now it			0.000	0.000	0.000	10.795	0.000
84	0.3	–1.8	–2							*sounds* much better.	W		–0.007	–0.417	–0.079	10.795	0.379
85	1.9	–2	–1.7										0.012	0.664	0.125	10.794	1.775
86	0.9	–1.8	–1.8										0.000	0.000	0.000	10.795	0.900
87	0.2	–1.7	–1.8										–0.004	–0.208	–0.039	10.795	0.239
88	0.8	–2.2	–1.8										0.015	0.849	0.160	10.794	0.640
89	0.6	–1.6	–1.4										0.007	0.421	0.079	10.795	0.521
90	0.2	–1.6	–1.6										0.000	0.000	0.000	10.795	0.200
91	0.4	–1.8	–1.2										0.022	1.255	0.236	10.792	0.164
92	1	–1.8	–1.4									8:12	0.015	0.855	0.161	10.794	0.839
93	0.6	–1.7	–1.1									8:34	0.022	1.264	0.238	10.792	0.362
94	0.4	–1.6	–1.4								W		0.007	0.418	0.079	10.795	0.321
95	0.6	–1.4	1										0.088	5.069	0.954	10.753	–0.354
96	0.3	–1.7	–1.5										0.007	0.417	0.079	10.795	0.221
97	0.7	–1.8	–0.9										0.033	1.904	0.359	10.789	0.341
98	0.5	–2	–2.8										–0.029	–1.679	–0.316	10.790	0.816
99	1.3	–2.1	–1.9										0.008	0.432	0.081	10.795	1.219
100									1	never released		8:37	0.000	0.000	0.000	10.795	0.000
101	1.4	–1.9	–1.7										0.008	0.434	0.082	10.795	1.318
102	0.3	–1.6	–1.5										0.004	0.208	0.039	10.795	0.261
103	1	–1.8	–1.8										0.000	0.000	0.000	10.795	1.000
104	1	–1.7	2.9				1				W		0.172	9.932	1.862	10.633	–0.862
105	0.7	–1.4	1.3				1						0.100	5.727	1.077	10.741	–0.377
106	1	–1.9	–1.7										0.007	0.428	0.081	10.795	0.919
107	0.3	–1.8	–2.1								W		–0.011	–0.625	–0.118	10.794	0.418
108	1.8	–2.1	0.4				1						0.096	5.526	1.040	10.745	0.760
109	0.8	–1.6	0.7										0.085	4.893	0.921	10.756	–0.121
110	0.6	–2.2	–2.1										0.004	0.211	0.040	10.795	0.560
111	0.3	–1.8	–1.8										0.000	0.000	0.000	10.795	0.300
112	0.3	–2.1	–1.2										0.033	1.876	0.353	10.789	–0.053
113									1			8:45	0.000	0.000	0.000	10.795	0.000
114	0.3	–2	–2										0.000	0.000	0.000	10.795	0.300
115	0.4	–2	–2										0.000	0.000	0.000	10.795	0.400
116	0.4	–2	–0.9										0.040	2.301	0.433	10.786	–0.033
117	0.3	–1.8	–1.8								W		0.000	0.000	0.000	10.795	0.300

118	1.4	−1.6	−1.4										0.008	0.434	0.082	10.795	1.318
119	0.3	−1.8	−1.7										0.004	0.208	0.039	10.795	0.261
120	1.1	−1.7	−1.8										−0.004	−0.215	−0.040	10.795	1.140
121	0.4	−1.8	−1.6										0.007	0.418	0.079	10.795	0.321
122									1				0.000	0.000	0.000	10.795	0.000
123	1	−1.7	−1.2										0.019	1.069	0.201	10.793	0.799
124	0.5	−1.6	−1.2										0.015	0.840	0.158	10.794	0.342
125									1				0.000	0.000	0.000	10.795	0.000
126	0.5	−1.7	−1.5										0.007	0.420	0.079	10.795	0.421
127	1	−1.4	2.7										0.153	8.834	1.658	10.667	−0.658
128	0.7	−1.9	−1.4										0.018	1.057	0.199	10.793	0.501
129	0.5	−1.8	−1.2										0.022	1.259	0.237	10.792	0.263
130	1.2	−1.6	−1.2										0.015	0.862	0.162	10.794	1.038
131	1.1	−1.6	1.8										0.127	7.336	1.378	10.707	−0.278
132	1	−1.7	−1.4										0.011	0.641	0.121	10.794	0.879
133	0.7	−2	0.7								W	9:01	0.100	5.727	1.077	10.741	−0.377
134	1	−1.7	2.5				1						0.157	9.053	1.699	10.661	−0.699
135	0.4	−1.7	−0.8										0.033	1.883	0.355	10.789	0.045
136	1.3	−1.4	3.4				1				W		0.181	10.493	1.966	10.614	−0.666
137	1.4	−1.5	−1.4										0.004	0.217	0.041	10.795	1.359
138	0.8	−1.7	1.1				1						0.104	5.963	1.121	10.737	−0.321
139	1	−1.8	1.6						1				0.127	7.308	1.373	10.707	−0.373
140	1	−1.9	2.1				1						0.149	8.616	1.617	10.673	−0.617
141	1.2	−1.8	2.2				1					9:10	0.150	8.681	1.629	10.671	−0.429
	95.20	*−193.90*	*−107.30*							*sum*				*194.89*	*36.50*	*1517.53*	*58.70*
	0.84	−1.72	−0.95							avg over valid data				1.72	0.32	13.43	0.52
	41.10	−95.70	−38.30							*sum over experiments 84–141*				*123.26*	*23.16*	*624.73*	*17.94*
	0.76	−1.77	−0.71							avg over valid data 84–141				2.28	0.43	11.57	0.33
	observations			no	drop dur.	flipped	sticky	board	cam	qualitative	new	time	computations				
exp#	*corner x*	*corner y*	*27.8−intercept*	pickup	rotation	@ release	release	crash	failure	observations	sheet		slope	angle (deg)	dx	dy	x0

		squared error				
y0	data valid	xc	yc	angle	x0	y0
9.083	1	0.020	0.000	20.028	0.488	6.922
10.795	0	0.710	2.944	2.975	0.270	0.844
8.891	1	20.771	0.047	196.008	3.822	7.967
9.186	1	0.066	0.013	16.700	1.051	6.389
9.193	1	0.551	0.100	164.434	2.751	6.352
10.795	0	0.710	2.944	2.975	0.270	0.844
8.995	1	0.128	0.007	2.975	0.463	7.390
8.794	1	0.025	0.081	0.756	0.102	8.525
8.795	1	0.209	0.081	2.975	0.609	8.518
10.795	0	0.710	2.944	2.975	0.270	0.844
8.995	1	0.003	0.007	2.285	0.116	7.391
9.040	1	1.087	0.013	130.726	1.212	7.146
10.795	0	0.710	2.944	2.975	0.270	0.844
10.795	0	0.710	2.944	2.975	0.270	0.844
10.795	0	0.710	2.944	2.975	0.270	0.844
10.795	0	0.710	2.944	2.975	0.270	0.844
8.895	1	0.294	0.034	4.586	0.020	7.946
8.995	1	0.002	0.007	2.288	0.058	7.391
9.294	1	1.118	0.047	1.126	1.576	5.853
8.961	1	0.551	0.007	39.499	0.193	7.577
8.795	1	1.581	0.007	87.119	0.240	8.520
8.795	1	0.917	0.081	1.648	1.434	8.520
9.095	1	0.128	0.000	2.975	0.463	6.857
8.992	1	0.311	0.007	0.178	0.403	7.406
8.995	1	0.294	0.007	2.299	0.067	7.391
8.620	1	0.311	0.148	25.345	0.152	9.570
10.795	0	0.710	2.944	2.975	0.270	0.844
8.795	1	0.020	0.081	2.975	0.033	8.518
9.243	1	0.128	0.047	15.160	0.142	6.103
9.295	1	0.020	0.047	4.612	0.068	5.851
9.295	1	0.294	0.047	2.299	0.067	5.850
9.095	1	0.196	0.000	2.975	0.014	6.857
9.395	1	0.020	0.100	2.975	0.033	5.376
9.395	1	0.020	0.100	4.612	0.068	5.377
9.094	1	0.209	0.000	1.158	0.433	6.860
8.795	1	0.294	0.081	3.737	0.032	8.518
8.989	1	0.025	0.007	0.040	0.014	7.424

10.795	0	0.710	2.944	2.975	0.270	0.844							
10.795	0	0.710	2.944	2.975	0.270	0.844							
8.994	1	0.413	0.007	5.511	0.041	7.394							
8.994	1	0.294	0.007	5.521	0.010	7.394							
8.995	1	0.128	0.007	2.278	0.410	7.391							
9.686	1	0.117	0.379	16.278	0.173	4.110							
9.747	1	0.413	0.513	50.953	0.489	3.868							
8.795	1	0.003	0.081	2.975	0.145	8.518							
8.894	1	0.025	0.034	1.173	0.129	7.948							
8.594	1	0.311	0.234	1.153	0.574	9.730							
8.995	1	0.002	0.007	3.752	0.103	7.391							
9.094	1	0.003	0.000	1.179	0.068	6.860							
8.694	1	0.025	0.148	1.173	0.129	9.116							
9.068	1	0.020	0.000	5.285	0.333	6.997							
8.895	1	0.025	0.034	2.283	0.194	7.944							
8.571	1	1.305	0.007	317.912	4.731	9.873							
9.193	1	0.413	0.013	7.633	0.015	6.352							
9.068	1	0.003	0.000	5.424	0.146	6.999							
9.092	1	0.002	0.000	0.204	0.002	6.871							
10.795	0	0.710	2.944	2.975	0.270	0.844							
9.494	1	0.294	0.173	1.209	0.114	4.925							
9.392	1	0.196	0.100	0.221	0.127	5.388							
10.795	0	0.710	2.944	2.975	0.270	0.844							
10.795	0	0.710	2.944	2.975	0.270	0.844							
8.919	1	0.002	0.007	25.989	1.004	7.812							
9.092	1	0.413	0.000	0.229	0.307	6.870							
10.795	0	0.710	2.944	2.975	0.270	0.844							
8.903	1	0.002	0.007	32.999	1.260	7.897							
9.365	1	0.003	0.100	6.467	0.179	5.515							
10.795	0	0.710	2.944	2.975	0.270	0.844							
10.795	0	0.710	2.944	2.975	0.270	0.844							
10.795	0	0.710	2.944	2.975	0.270	0.844							
10.795	0	0.710	2.944	2.975	0.270	0.844							
10.795	0	0.710	2.944	2.975	0.270	0.844							
10.795	0	0.710	2.944	2.975	0.270	0.844							
10.795	0	0.710	2.944	2.975	0.270	0.844							
9.093	1	0.413	0.000	0.471	0.265	6.866							
9.286	1	0.196	0.047	0.333	0.306	5.891							
9.382	1	0.002	0.100	1.074	0.057	5.434							
9.484	1	0.002	0.173	0.678	0.040	4.969							

10.795	0	0.710	2.944	2.975	0.270	0.844							
9.574	1	8.165	2.005	488.773	1.396	4.575							
9.086	1	2.124	0.100	144.267	0.613	6.902							
10.795	0	0.710	2.944	2.975	0.270	0.844							
9.271	1	0.020	0.047	4.354	0.288	5.965							
10.795	0	0.710	2.944	2.975	0.270	0.844							
8.995	1	0.294	0.007	4.586	0.020	7.392							
8.794	1	1.118	0.081	1.126	1.576	8.522							
8.995	1	0.003	0.007	2.975	0.145	7.390							
9.095	1	0.413	0.000	3.734	0.079	6.857							
8.594	1	0.002	0.234	0.767	0.015	9.733							
9.195	1	0.059	0.013	1.699	0.000	6.344							
9.195	1	0.413	0.013	2.975	0.102	6.343							
8.992	1	0.196	0.007	0.221	0.127	7.404							
8.994	1	0.025	0.007	0.756	0.102	7.397							
9.092	1	0.059	0.000	0.212	0.025	6.870							
9.195	1	0.196	0.013	1.707	0.039	6.344							
9.353	1	0.059	0.100	11.182	0.762	5.573							
9.095	1	0.294	0.000	1.711	0.089	6.858							
8.989	1	0.020	0.007	0.032	0.032	7.423							
8.790	1	0.117	0.081	11.588	0.088	8.545							
8.695	1	0.209	0.148	1.670	0.489	9.113							
10.795	0	0.710	2.944	2.975	0.270	0.844							
8.895	1	0.311	0.034	1.666	0.638	7.946							
9.195	1	0.294	0.013	2.299	0.067	6.343							
8.995	1	0.025	0.007	2.975	0.231	7.390							
8.933	1	0.025	0.000	67.361	1.908	7.730							
9.341	1	0.020	0.100	16.022	0.804	5.628							
8.895	1	0.025	0.034	1.682	0.160	7.946							
8.994	1	0.294	0.007	5.521	0.010	7.394							
8.645	1	0.917	0.148	14.452	0.058	9.417							
9.156	1	0.002	0.013	10.036	0.410	6.543							
8.595	1	0.059	0.234	2.292	0.002	9.726							
8.995	1	0.294	0.007	2.975	0.048	7.390							
8.689	1	0.294	0.148	0.023	0.328	9.146							
10.795	0	0.710	2.944	2.975	0.270	0.844							
8.795	1	0.294	0.081	2.975	0.048	8.518							
8.795	1	0.196	0.081	2.975	0.014	8.518							
8.786	1	0.196	0.081	0.333	0.306	8.569							
8.995	1	0.294	0.007	2.975	0.048	7.390							

9.195	1	0.311	0.013	1.666	0.638	6.345	
8.995	1	0.294	0.007	2.299	0.067	7.391	
9.095	1	0.066	0.000	3.761	0.386	6.857	
8.995	1	0.196	0.007	1.707	0.039	7.392	
10.795	0	0.710	2.944	2.975	0.270	0.844	
9.093	1	0.025	0.000	0.430	0.078	6.866	
9.194	1	0.117	0.013	0.783	0.032	6.349	
10.795	0	0.710	2.944	2.975	0.270	0.844	
9.095	1	0.117	0.000	1.703	0.010	6.858	
9.267	1	0.025	0.100	50.549	1.386	5.986	
8.893	1	0.020	0.034	0.445	0.000	7.954	
8.992	1	0.117	0.007	0.216	0.066	7.405	
9.194	1	0.128	0.013	0.745	0.269	6.349	
9.107	1	0.066	0.013	31.485	0.636	6.796	
9.094	1	0.025	0.000	1.173	0.129	6.860	
8.741	1	0.020	0.081	16.022	0.804	8.835	
8.961	1	0.025	0.000	53.711	1.484	7.579	
9.089	1	0.196	0.000	0.025	0.225	6.887	
9.214	1	0.209	0.100	76.885	1.405	6.245	
9.295	1	0.311	0.047	2.273	0.705	5.850	
9.037	1	0.002	0.000	17.965	0.707	7.166	
8.907	1	0.025	0.007	31.175	0.797	7.875	
8.773	1	0.025	0.034	47.486	1.292	8.646	
8.871	1	0.128	0.007	48.397	0.900	8.078	
1323.63	113	0.811	0.893	4.741	0.717	2.723	<– std dev
11.71	80 %	<–success rate					
529.03	54	0.477	0.509	3.295	0.637	2.734	<– std dev
9.80	93 %	<–success rate					
		squared error					
y0	data valid	xc	yc	angle	x0	y0	