Keypoints detector SHITOMASI			Keypoints descriptors BRISK			BRIEF
number of keypoints	1	time in ms	Matched pts		time in ms	Matched pts
,,	125	42,0977	·		1,77734	•
	118	26,3241		95	2,60485	115
	123	27,8315		88	2,69764	111
	120	28,64		80	2,73345	104
	120	21,8177		90	, 2,7188	101
	113	31,3984		82	4,13463	102
	114	28,6932		79	2,55989	102
	123	22,5906		85	2,6597	100
	111	19,5002		86	2,53776	109
	112	23,609		82	2,52265	100
HARRIS			BRISK			BRIEF
number of keypoints	1	time in ms	Matched pts		time in ms	Matched pts
	17	28,3792			0,589355	
	14	32,6843		12	1,40593	14
	18	32,7942		10	2,20982	11
	21	30,7491		14	1,79599	15
	26	33,8281		15	1,86525	20
	43	59,2363		16	1,34164	24
	18	24,6506		16	2,06668	26
	31	37,361		15	1,71834	16
	26	31,6786		23	1,65624	24
	34	42,9805		21	1,91658	23
FAST			BRISK			BRIEF
number of keypoints	t	time in ms	Matched pts		time in ms	Matched pts
	149	0,963288			2,62316	
	152	1,31781		97	3,0567	119
	150	1,03218	-	104	2,53411	130
	155	1,26562	-	101	3,35859	118
	149	1,20588		98	2,25453	126
	149	0,930502		85	1,96427	108
	156	1,14513	-	107	2,06022	123
	150	1,27626	-	107	3,1695	131
	138	1,03429	·	100	2,90582	125
	143	2,09801	-	100	2,09884	119
BRISK			BRISK			BRIEF
number of keypoints	1	time in ms	Matched pts		time in ms	Matched pts
	264	42,8021			3,67	
	282	41,6923		171	3,32	178
	282	42,447		176	3,46	205
	277	42,08		157	6,6	185
	297	69,8223		176	3,443	179
	279	45,6821		174	5,32	183
	289	40,2603		188	3,07	195
	272	40,39		173	3,28	207
	266	43,129	-	171	2,946	189
	254	68,27		184	3,634	183

ORB			BRISK			BRIEF
number of keypoints		time in ms	Matched pts		time in ms	Matched pts
	92	9,58783			2,112	
	102	11,2402		73	1,3899	49
	106	9,111		74	1,35021	43
	113	7,27233		79	1,4593	45
	109	6,81303		85	1,83543	59
	125	7,3332		79	1,62212	53
	160	19,0001		92	1,72827	78
	129	8,54963		90	2,39376	68
	127	10,737		88	1,70353	84
	128	15,118		91	1,6838	66
AKAZE			BRISK			BRIEF
number of keypoints		time in ms	Matched pts		time in ms	Matched pts
	166	242,478			3,28752	
	157	240,643		137	3,70142	
	161	160,442		125	2,42771	
	155	157,635		129	3,12617	
	163	141,466		129	2,87278	130
	164	230,659		131	3,27935	
	173	148,928		132	3,12447	
	173	151,314		124	· ·	150
	177	131,699		146	•	
	179	146,118		144	3,40917	152
SIFT			BRISK			BRIEF
number of keypoints		time in ms	Matched pts		time in ms	Matched pts
	138	204,123			1,85413	
	132	197,817		64	1,77102	
	124	170,42		66	3,32289	
	137	152,286		62	1,82141	76
	134	181,383		66	2,26986	85
	140	223,49		59	3,10577	69
	137	324,673		64	3,15571	74
	148	153,577		64	1,94262	
	159	276,368		67	3,367431	70
	137	237,395		80	3,42656	88

	ORB		FREAK		AKAZE	
time in ms	Matched pts	time in ms	Matched pts	time in ms	Matched pts	time in ms
1,08766	•	2,75695		68,7236	, , , , , , , , , , , , , , , , , , ,	
4,64839			86			
2,29353		-	90	•		
3,51627		•	86	-		
2,82316		-	88	-		
2,4285		-	86	•		
2,86796		•	80	•		
3,15556		•	81	•		
1,95042		-	86	-		
2,3066		•	85	-		
2,3000	ORB	1,1 1307	FREAK	73,013	AKAZE	
time in ms	Matched pts	time in ms	Matched pts	time in ms	Matched pts	time in ms
0,57529	•	1,51924	Waterica pts	66,6871	Waterica pts	time in ins
1,9465		-	13	•		
2,10985			13	-		
7,12934		•	15	-		
2,2		-	15	•		
1,94202		•	17	-		
2,21961		-	20	•		
1,89092		-	12	-		
2,13831			21	•		
1,98245		•	18	•		
1,36243	ORB	•	FREAK	70,43	AKAZE	
time in ms	Matched pts		Matched pts	time in ms	Matched pts	time in me
3,52863	•	1,28917	Matched pts	50,2112	iviaterieu pts	time in ms
2,27418			98			
1,93951		-	99	-		
2,69328		•	91	-		
1,13241		1 (14/17/1		50 00 /X		
		•		· ·		
	126	2,1378	98	53,2607		
2,4157	126 106	2,1378 1,0133	98 85	53,2607 58,9544		
2,4157 1,63251	126 106 122	2,1378 1,0133 1,13547	98 85 99	53,2607 58,9544 59,3146		
2,4157 1,63251 1,28881	126 106 122 122	2,1378 1,0133 1,13547 1,22327	98 85 99 102	53,2607 58,9544 59,3146 60,6274		
2,4157 1,63251 1,28881 1,24212	126 106 122 122 123	2,1378 1,0133 1,13547 1,22327 1,38529	98 85 99 102 101	53,2607 58,9544 59,3146 60,6274 56,1742		
2,4157 1,63251 1,28881	126 106 122 122 123 119	2,1378 1,0133 1,13547 1,22327 1,38529	98 85 99 102 101 105	53,2607 58,9544 59,3146 60,6274 56,1742	ΔΚΔ7Ε	
2,4157 1,63251 1,28881 1,24212 1,24741	126 106 122 122 123 119 ORB	2,1378 1,0133 1,13547 1,22327 1,38529 1,34782	98 85 99 102 101 105 FREAK	53,2607 58,9544 59,3146 60,6274 56,1742 48,8024	AKAZE Matched pts	time in ms
2,4157 1,63251 1,28881 1,24212 1,24741 time in ms	126 106 122 122 123 119 ORB Matched pts	2,1378 1,0133 1,13547 1,22327 1,38529 1,34782 time in ms	98 85 99 102 101 105	53,2607 58,9544 59,3146 60,6274 56,1742 48,8024 time in ms	AKAZE Matched pts	time in ms
2,4157 1,63251 1,28881 1,24212 1,24741 time in ms 2,813	126 106 122 122 123 119 ORB Matched pts	2,1378 1,0133 1,13547 1,22327 1,38529 1,34782 time in ms 7,895	98 85 99 102 101 105 FREAK Matched pts	53,2607 58,9544 59,3146 60,6274 56,1742 48,8024 time in ms 53,05		time in ms
2,4157 1,63251 1,28881 1,24212 1,24741 time in ms 2,813 1,327	126 106 122 122 123 119 ORB Matched pts	2,1378 1,0133 1,13547 1,22327 1,38529 1,34782 time in ms 7,895 6,12	98 85 99 102 101 105 FREAK Matched pts	53,2607 58,9544 59,3146 60,6274 56,1742 48,8024 time in ms 53,05 57,2177		time in ms
2,4157 1,63251 1,28881 1,24212 1,24741 time in ms 2,813 1,327 1,156	126 106 122 122 123 119 ORB Matched pts	2,1378 1,0133 1,13547 1,22327 1,38529 1,34782 time in ms 7,895 6,12 6,09	98 85 99 102 101 105 FREAK Matched pts	53,2607 58,9544 59,3146 60,6274 56,1742 48,8024 time in ms 53,05 57,2177 58,2067		time in ms
2,4157 1,63251 1,28881 1,24212 1,24741 time in ms 2,813 1,327 1,156	126 106 122 122 123 119 ORB Matched pts	2,1378 1,0133 1,13547 1,22327 1,38529 1,34782 time in ms 7,895 6,12 6,09 7,281	98 85 99 102 101 105 FREAK Matched pts 160 177 155	53,2607 58,9544 59,3146 60,6274 56,1742 48,8024 time in ms 53,05 57,2177 58,2067 56,6117		time in ms
2,4157 1,63251 1,28881 1,24212 1,24741 time in ms 2,813 1,327 1,156 1,155 2,19212	126 106 122 122 123 119 ORB Matched pts 162 175 158 167	2,1378 1,0133 1,13547 1,22327 1,38529 1,34782 time in ms 7,895 6,12 6,09 7,281 6,511	98 85 99 102 101 105 FREAK Matched pts 160 177 155 173	53,2607 58,9544 59,3146 60,6274 56,1742 48,8024 time in ms 53,05 57,2177 58,2067 56,6117 57,12		time in ms
2,4157 1,63251 1,28881 1,24212 1,24741 time in ms 2,813 1,327 1,156 1,155 2,19212 1,2556	126 106 122 122 123 119 ORB Matched pts 162 175 158 167 160	2,1378 1,0133 1,13547 1,22327 1,38529 1,34782 time in ms 7,895 6,12 6,09 7,281 6,511 12,07	98 85 99 102 101 105 FREAK Matched pts 160 177 155 173 161	53,2607 58,9544 59,3146 60,6274 56,1742 48,8024 time in ms 53,05 57,2177 58,2067 56,6117 57,12 57,37		time in ms
2,4157 1,63251 1,28881 1,24212 1,24741 time in ms 2,813 1,327 1,156 1,155 2,19212 1,2556 1,395	126 106 122 122 123 119 ORB Matched pts 162 175 158 167 160 182	2,1378 1,0133 1,13547 1,22327 1,38529 1,34782 time in ms 7,895 6,12 6,09 7,281 6,511 12,07 5,608	98 85 99 102 101 105 FREAK Matched pts 160 177 155 173 161 183	53,2607 58,9544 59,3146 60,6274 56,1742 48,8024 time in ms 53,05 57,2177 58,2067 56,6117 57,12 57,37 49,95		time in ms
2,4157 1,63251 1,28881 1,24212 1,24741 time in ms 2,813 1,327 1,156 1,155 2,19212 1,2556 1,395 1,1261	126 106 122 122 123 119 ORB Matched pts 162 175 158 167 160 182 167	2,1378 1,0133 1,13547 1,22327 1,38529 1,34782 time in ms 7,895 6,12 6,09 7,281 6,511 12,07 5,608 6,435	98 85 99 102 101 105 FREAK Matched pts 160 177 155 173 161 183 169	53,2607 58,9544 59,3146 60,6274 56,1742 48,8024 time in ms 53,05 57,2177 58,2067 56,6117 57,12 57,37 49,95 57,12		time in ms
2,4157 1,63251 1,28881 1,24212 1,24741 time in ms 2,813 1,327 1,156 1,155 2,19212 1,2556 1,395	126 106 122 122 123 119 ORB Matched pts 162 175 158 167 160 182 167	2,1378 1,0133 1,13547 1,22327 1,38529 1,34782 time in ms 7,895 6,12 6,09 7,281 6,511 12,07 5,608 6,435 6,228	98 85 99 102 101 105 FREAK Matched pts 160 177 155 173 161 183	53,2607 58,9544 59,3146 60,6274 56,1742 48,8024 time in ms 53,05 57,2177 58,2067 56,6117 57,12 57,37 49,95 57,12 59,799		time in ms

	ORB		FREAK		AKAZE	
time in ms	Matched pts	time in ms	Matched pts	time in ms	Matched pts	desc ms
1,70952		7,96255		52,1071		
0,519415	67	6,77302	42	51,2726		
0,954962	70	6,40856	36	64,3322		
0,632916	72	8,234	44	68,9229		
1,20375	84	10,9406	47	70,9775		
8,63894	91	15,6767	44	60,7096		
1,54657	101	5,71003	51	62,3943		
1,11621	92	4,32482	52	60,3579		
1,57644	93	13,1852	48	58,7772		
1,45874	93	5,05721	56	72,0677		
	ORB		FREAK		AKAZE	
time in ms	Matched pts	time in ms	Matched pts	time in ms	Matched pts	time in ms
2,8924		7,33239		65,3399		117,401
3,31623	131	6,19312	126	65,7274	138	112,567
1,51899	129	7,30775	129	85,4556	138	133,004
1,37268		•	127	·	133	· ·
1,62445	117	6,72293	121	-	127	•
1,77086		•	122	74,9613	129	159,22
3,49065	131	5,55181	133	71,3775	146	123,805
5,12285		•	144		147	•
1,53847		· ·	147		151	· ·
1,80686		6,95304	138	75,7142	150	184,941
	ORB		FREAK		AKAZE	
time in ms	Matched pts	time in ms	Matched pts		Matched pts	time in ms
0,970927				58,3618		
1,04496			65	•		
1,29686			72	•		
1,34435			64	•		
1,50289			66			
0,883481			59	79,665		
2,27874			59	67,0515		
1,28777			64	68,8745		
1,5891			65	·		
1,34681			79	78,9497		

SIFT
Matc

Matched pts	time in ms
'	39,5051
11	
10	
10	
10	
9	
10	•
9	
10	
9	•
SIFT	23,0031
Matched pts	time in ms
	42,8876
1	4 36,3153
1	1 43,8718
1	
1	9 37,7566
2	
	2 33,6676
	3 40,1789
2	
2	•
	2 30,7074
SIFT	
SIFT Matched pts	time in ms
	time in ms 33,0099
	33,0099
Matched pts	33,0099 8 34,5987
Matched pts 11 12	33,0099 8 34,5987 3 46,0045
Matched pts 11 12 11	33,0099 8 34,5987 3 46,0045 0 35,7623
Matched pts 11 12 11 11	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913
Matched pts 11 12 11 11 11	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501
Matched pts 11 12 11 11 11	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637
Matched pts 11 12 11 11 11 11 11	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816
Matched pts 11 12 11 11 11 11 11 12 11 11 12	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816 7 29,8301
Matched pts 11 12 11 11 11 11 11	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816 7 29,8301
Matched pts 11 12 11 11 11 11 12 11 10 SIFT	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816 7 29,8301
Matched pts 11 12 11 11 11 11 12 11 10 SIFT	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816 7 29,8301 3 36,8
Matched pts 11 12 11 11 11 11 12 11 10 SIFT	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816 7 29,8301 3 36,8 5 time in ms 73,3431
Matched pts 11 12 11 11 11 12 11 10 SIFT Matched pts	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816 7 29,8301 3 36,8 6 time in ms 73,3431 2 67,2029
11 12 11 11 11 11 12 11 10 SIFT Matched pts	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816 7 29,8301 3 36,8 5 time in ms 73,3431 2 67,2029 3 96,3124
Matched pts 11 12 11 11 11 12 11 10 SIFT Matched pts	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816 7 29,8301 3 36,8 5 time in ms 73,3431 2 67,2029 3 96,3124 9 74,8846
Matched pts 11 12 11 11 11 12 11 10 SIFT Matched pts 18 19 16	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816 7 29,8301 3 36,8 6 time in ms 73,3431 2 67,2029 3 96,3124 9 74,8846 3 93,1744
11 12 11 11 11 12 11 10 SIFT Matched pts 18 19 16 18	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816 7 29,8301 3 36,8 6 time in ms 73,3431 2 67,2029 3 96,3124 9 74,8846 3 93,1744 1 74,4171
Matched pts 11 12 11 11 11 12 11 10 SIFT Matched pts 18 19 16 18 17	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816 7 29,8301 3 36,8 6 time in ms 73,3431 2 67,2029 3 96,3124 9 74,8846 3 93,1744 1 74,4171 5 69,5776
Matched pts 11 12 11 11 11 11 12 11 10 SIFT Matched pts 18 19 16 18 17	33,0099 8 34,5987 3 46,0045 0 35,7623 9 41,9913 4 42,9501 9 35,637 3 50,3816 7 29,8301 3 36,8 6 time in ms 73,3431 2 67,2029 3 96,3124 9 74,8846 3 93,1744 1 74,4171 5 69,5776 4 72,4525

SIFT

SIFT	
Matched pts	time in ms
	89,5034
67	76,2952
79	108,16
78	110,642
79	98,9473
82	112,031
95	114,199
95	120,881
94	107,171
94	131,061
SIFT	
Matched pts	time in ms
	40,4904
134	52,4264
134	49,2921
130	88,4674
136	66,0216
137	59,0221
147	65,6723
147	57,6655
154	73,3589
151	58,9479
SIFT	
Matched pts	time in ms
	139,2
82	112,105
81	147,469
85	128,66
93	149,766
90	152,237
81	109,537
82	107,811
102	103,347
104	105,127