

BRISK detector shows the highest number of keypoints detected, while HARRIS detects the fewest. With HARRIS corner detection, all keypoints detected were in the upper half of the car. However, FAST and ORB detectors take much less runtime while performing reasonably well for keypoint detection. Keypoint matching seems to perform generally better with BRISK detector than ORB detector.

Top 3 detector-descriptor combinations considering both latency and number of keypoints detected/matched:

- 1. FAST + BRIEF
- 2. FAST+ORB
- 3. ORB+ORB

| Task 1. | Number of keypoints | | | | | | | | | | Detector |
|--------------------|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------------|
| Time: 18.82 ms | 125 | 118 | 123 | 120 | 120 | 113 | 114 | 123 | 111 | 112 | Shi-Tomasi |
| Time: 21 ms | 17 | 14 | 18 | 21 | 26 | 43 | 18 | 31 | 26 | 34 | HARRIS |
| Avg Time: 0.972 ms | 149 | 152 | 150 | 155 | 149 | 149 | 156 | 150 | 138 | 143 | FAST |
| Avg Time: 374 ms | 264 | 282 | 282 | 277 | 297 | 279 | 289 | 272 | 266 | 254 | BRISK |
| Avg Time: 7.5 ms | 92 | 102 | 106 | 113 | 109 | 125 | 130 | 129 | 127 | 128 | ORB |
| Avg Time: 77 ms | 166 | 157 | 106 | 161 | 155 | 163 | 164 | 173 | 175 | 177 | AKAZE |
| Avg Time: 134 ms | 138 | 132 | 124 | 137 | 134 | 140 | 137 | 148 | 159 | 137 | SIFT |
| Task 2. | Number of matches keypoints | | | | | | | | | | |
| | Detector: Shi-Tomasi | | | | | | | | | | Descriptor |
| Time: 343 ms | 125 | 95 | 88 | 80 | 90 | 82 | 79 | 85 | 86 | 82 | BRISK |
| Time: 1.6 ms | 125 | 115 | 111 | 104 | 101 | 102 | 102 | 100 | 109 | 100 | BRIEF |
| Time: 1.15 ms | 125 | 106 | 102 | 99 | 102 | 103 | 97 | 98 | 104 | 97 | ORB |
| Time: 42 ms | 125 | 86 | 90 | 86 | 88 | 86 | 80 | 81 | 86 | 85 | FREAK |
| Time: 74 ms | 125 | 112 | 111 | 101 | 106 | 105 | 101 | 99 | 108 | 96 | AKAZE |
| Time: 19 ms | 125 | 112 | 109 | 104 | 103 | 99 | 101 | 96 | 106 | 97 | SIFT |
| | Detector: HARRIS | | | | | | | | | | |
| Time: 330 ms | 17 | 12 | 10 | 14 | 15 | 16 | 16 | 15 | 23 | 21 | BRISK |
| Time: 1.67 ms | 17 | 14 | 11 | 15 | 20 | 24 | 26 | 16 | 24 | 23 | BRIEF |
| Time: 0.96 ms | 17 | 12 | 12 | 15 | 18 | 24 | 20 | 15 | 24 | 22 | ORB |
| Time: 40.5 ms | 17 | 13 | 13 | 15 | 15 | 17 | 20 | 12 | 21 | 18 | FREAK |
| Time: 80 ms | 17 | 14 | 14 | 18 | 17 | 23 | 27 | 14 | 26 | 24 | AKAZE |
| Time: 21 ms | 17 | 14 | 11 | 16 | 19 | 22 | 22 | 13 | 24 | 22 | SIFT |
| | Detector: FAST | | | | | | | | | | |
| Time: 342 ms | 149 | 97 | 104 | 101 | 98 | 85 | 107 | 107 | 100 | 100 | BRISK |
| Time: 1.15 ms | 149 | 119 | 130 | 118 | 126 | 108 | 123 | 131 | 125 | 119 | BRIEF |
| Time: 1.19 ms | 149 | 118 | 123 | 112 | 126 | 106 | 122 | 122 | 123 | 119 | ORB |
| Time: 43.29 ms | 149 | 98 | 99 | 91 | 98 | 85 | 99 | 102 | 101 | 105 | FREAK |
| Time: 71.9 | 149 | 128 | 132 | 121 | 133 | 119 | 127 | 133 | 126 | 115 | AKAZE |
| Time: 26.33 | 149 | 118 | 123 | 110 | 119 | 114 | 119 | 123 | 117 | 103 | SIFT |

| | | | | | | | | | | | | |
|---------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| | Detector: BRISK | | | | | | | | | | | |
| Time: 333 ms | | 262 | 171 | 176 | 157 | 176 | 174 | 188 | 173 | 171 | 184 | BRISK |
| Time: 1.69 ms | | 236 | 178 | 205 | 185 | 179 | 183 | 195 | 207 | 189 | 183 | BRIEF |
| Time: 5.8 ms | | 264 | 162 | 175 | 158 | 167 | 160 | 182 | 167 | 171 | 172 | ORB |
| Time: 42.8 ms | | 240 | 160 | 177 | 155 | 173 | 161 | 183 | 169 | 178 | 168 | FREAK |
| Time: 70 ms | | 264 | 148 | 157 | 147 | 142 | 146 | 150 | 152 | 146 | 151 | AKAZE |
| Time: 46 ms | | 264 | 182 | 193 | 169 | 183 | 171 | 195 | 194 | 176 | 183 | SIFT |
| | Detector: ORB | | | | | | | | | | | |
| Time: 318 ms | | 83 | 73 | 74 | 79 | 85 | 79 | 92 | 90 | 88 | 91 | BRISK |
| Time: 0.69 ms | | 66 | 49 | 43 | 45 | 59 | 53 | 78 | 68 | 84 | 66 | BRIEF |
| Time: 4.8 ms | | 92 | 67 | 70 | 72 | 84 | 91 | 101 | 92 | 93 | 93 | ORB |
| Time: 38 ms | | 46 | 42 | 36 | 44 | 47 | 44 | 51 | 52 | 48 | 56 | FREAK |
| Time: 70.5 ms | | 83 | 42 | 53 | 57 | 55 | 49 | 54 | 74 | 60 | 61 | AKAZE |
| Time: 48.5 ms | | 83 | 67 | 79 | 78 | 79 | 82 | 95 | 95 | 94 | 94 | SIFT |
| | Detector: AKAZE | | | | | | | | | | | |
| Time: 315 ms | | 166 | 137 | 125 | 129 | 129 | 131 | 132 | 142 | 146 | 144 | BRISK |
| Time: 2.1 ms | | 158 | 141 | 134 | 131 | 130 | 134 | 146 | 150 | 148 | 152 | BRIEF |
| Time: 3.4 ms | | 166 | 131 | 129 | 127 | 117 | 130 | 131 | 137 | 135 | 145 | ORB |
| Time: 43 ms | | 166 | 126 | 129 | 127 | 121 | 122 | 133 | 144 | 147 | 138 | FREAK |
| Time: 68 ms | | 166 | 138 | 137 | 131 | 128 | 128 | 145 | 147 | 149 | 149 | AKAZE |
| Time: 29 ms | | 166 | 134 | 134 | 130 | 136 | 137 | 147 | 147 | 154 | 151 | SIFT |
| | Detector: SIFT | | | | | | | | | | | |
| Time: 325 ms | | 95 | 64 | 66 | 62 | 66 | 59 | 64 | 64 | 67 | 80 | BRISK |
| Time: 0.95 ms | | 96 | 86 | 78 | 76 | 85 | 69 | 74 | 76 | 70 | 88 | BRIEF |
| Time: 43.73 | | 95 | 65 | 72 | 64 | 66 | 59 | 59 | 64 | 65 | 79 | FREAK |
| Time: 63 ms | | 62 | 41 | 41 | 33 | 44 | 40 | 35 | 50 | 51 | 47 | AKAZE |
| Time: 87 ms | | 138 | 82 | 81 | 85 | 93 | 90 | 81 | 82 | 102 | 104 | SIFT |