Vision Aided Navigation 2024 - Exercise 1

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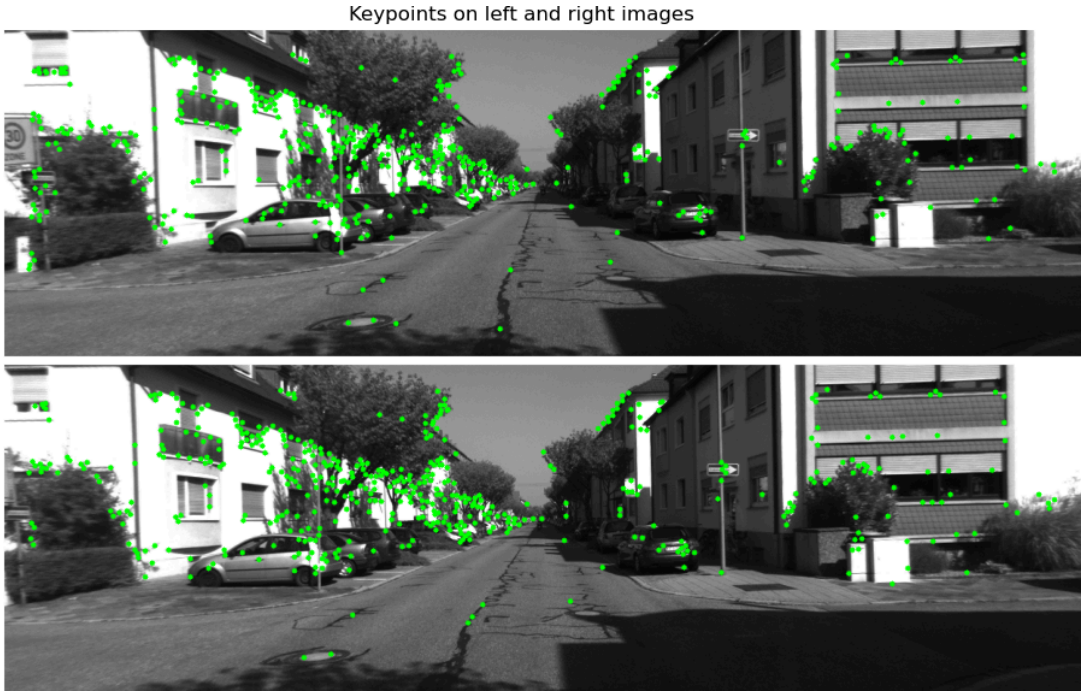
https://github.com/AmitaiOvadia/SLAMProject/blob/main/VAN_ex/code/Ex1.py

(1.1)

Here are 500 features detected using the AKAZE feature extraction algorithm:



(1.2)

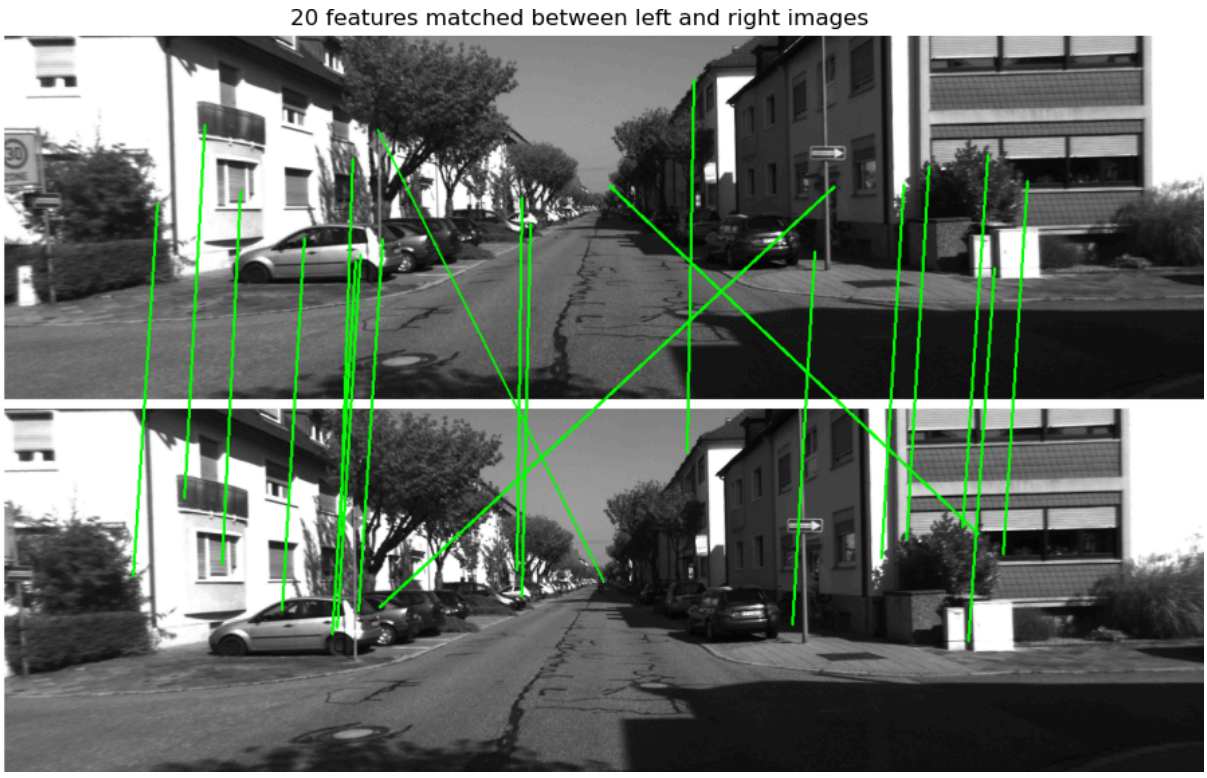
I calculated descriptors using the AKAZE algorithm. Here is how the first 2 descriptors look like:

```
first feature descriptor:
[ 67 253 205 100   0 179  33  38 211 188  73  31 143  99 244 223  57  99
 140 136  16   0 240 156 115 102   0  32 220  27 160 152  49 102 196 140
 206 121 206  25  49  50 186 111 136 252 115 220  24 159 227  49 142 177
 247 239 143 131 176 255  15]

second feature descriptor:
[ 33  18 124  52 140  17   0 129 101   1 112  30   4   0 224 247 253  65
 119 232  14 238 240 135   1   2   0  28   6   0   0  34 128 171 112  21
  87  13 128  42  84  84   3 106 209 248  31 158   7 247 224  15 127 128
   1   2   0 224 121 255  63]
```

(1.3)

Here are 20 matches between the descriptors of the key-points found in the left and right images.
The distance function used was a simple L2 norm between the descriptor vectors.



(1.4)

- Now I used a significance test to reject matches.
- Here are the first 20 matches as given by the AKAZE algorithm in cv2 (green), after using a ratio of 0.4
- Out of 1523 matches, 1276 were discarded and 247 remained.
- In red, there is an example of a discarded point that appears nevertheless to have been a good match. Its ratio score was 0.77 which is well above the 0.4 threshold.