Speed Limit Sign Detection

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CS 495

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Objective

- Given a series of images, detect speed limit signs and produce an output text file with the name of the image that contains the x and y coordinates of the sign location

Approach

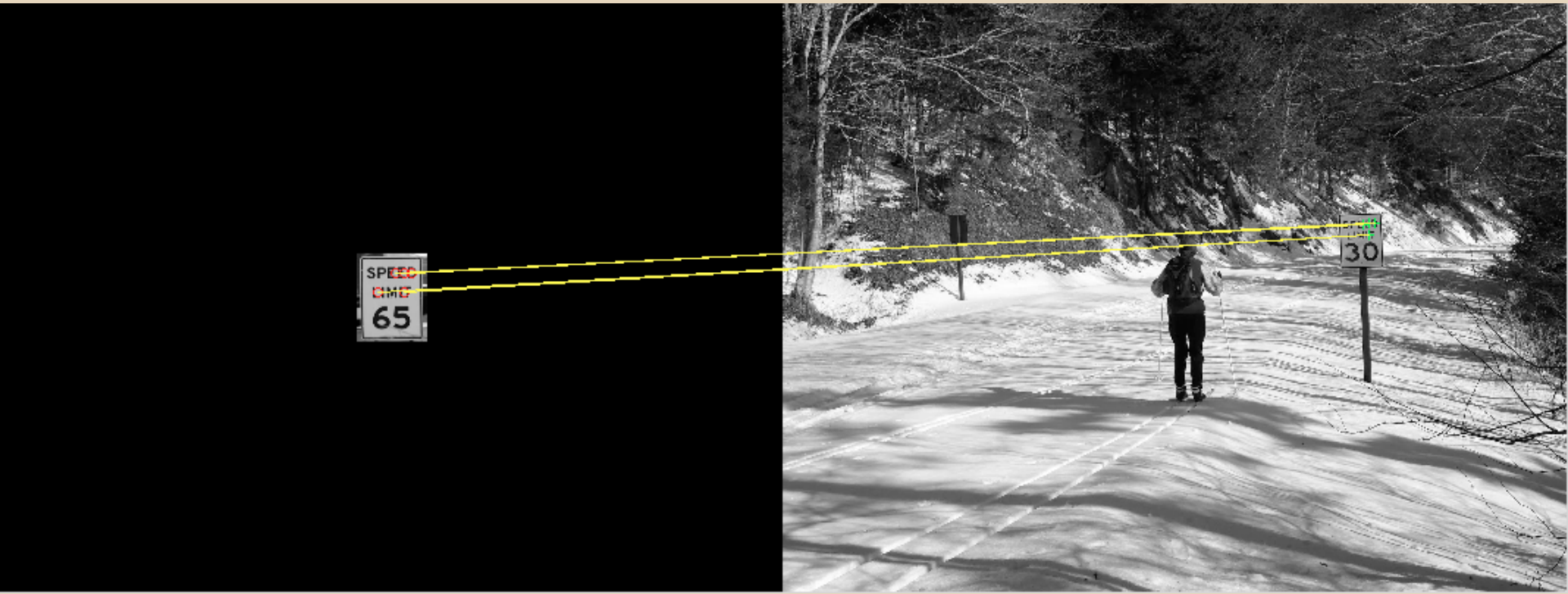
- implemented SURF (Speeded Up Robust Features) detection algorithm.
  - SURF Feature detection requires images to be grayscale

- utilized eight different templates for a comparison with each image
- detected similar features between the template signs and the potential signs in the test images

- created a counter for keeping track of how many comparisons found a sign match with the current tested image.
  - a hard-coded threshold of 75% feature match (6 out of 8 templates) to remove false positives and assure accuracy, if less than 6 templates, matches are ignored

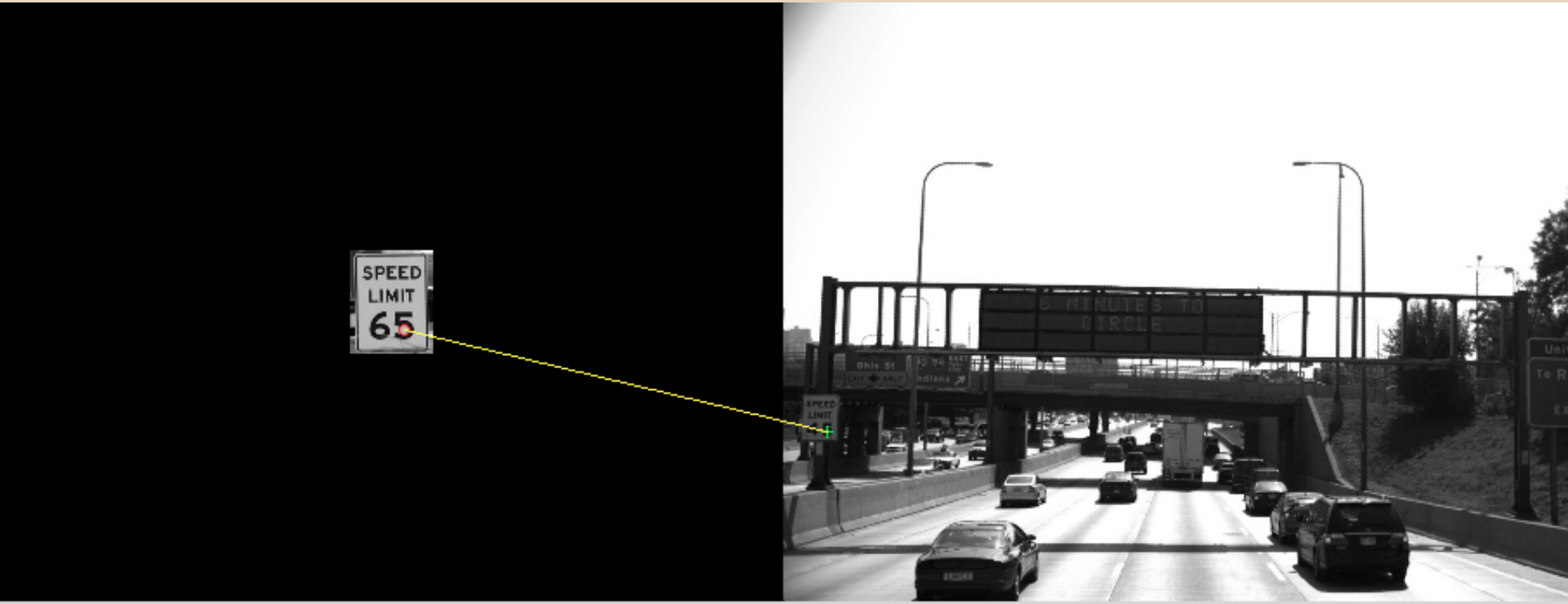
Sample Image 1

Results: Image 1



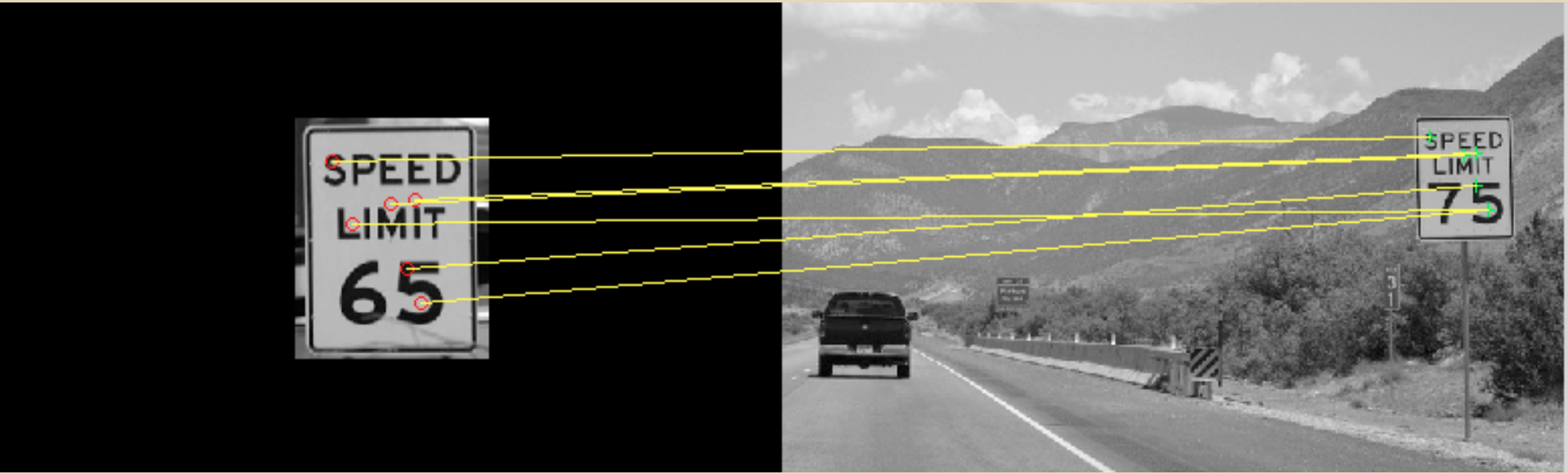
Sample Image 2

Results: Image 2



Sample Image 3

Results: Image 3



Results: Output Text File

Screenshot of ‘result.txt’

x9 - image 1

test6 - image 2

x1 - image 3

```
>>>x9.jpg : x =1197.2666, y =459.5597
>>>test6.jpg : x =75.8341, y =734.2704
>>>x1.jpg : x =511.2048, y =128.4769
```

Conclusion

- On some occasions the script detects false positives and finds the white color on the sign and incorrectly compares it with random bright spots in the test image, thus not detecting a sign.

- However, accuracy-wise the script works correctly on >90% of images