Homework 2 Writeup

Instructions

- This write-up is intended to be 'light'; its function is to help us grade your work.
- Please describe any interesting or non-standard decisions you made in writing your algorithm.
- Show your results and discuss any interesting findings.
- List any extra credit implementation and its results.
- Feel free to include code snippets, images, and equations.
- Use as many pages as you need, but err on the short side.
- **Please make this document anonymous.**

Assignment Overview

In this project, we were responsible for creating a program that creates a local feature matching algorithm to match multiple views of real-world scenes. Here, we were told to implement a simplified version of SIFT. SIFT is an algorithm used to detect, describe, and match local features in images.

Implementation Detail

This project asked us to implement the three major methods of local feature matching:

- getfeaturepoints
  - Here we were asked to implement the Harris corner detector algorithm. The Harris corner detector uses approximations and linear algebra to reduce the cost of calculating a corner score for each point in the image.
- getfeaturedescriptors
  - For this method we were asked to implement a SIFT-like local feature descriptor. This told us that we had to compute the similarities between images. According to the handout, features consist of an interest point and it tells us about a point's immediate neighbor.

- matchfeatures
  - For the third implementation we were asked to do, we had to implement a nearest neighbor distance ratio. This algorithm, as described in its name, returns the distance between two features. With this, we would be able to match different features to one another.

Result

1. Notre Dame
   - Matches:1275
   - Accuracy on 50 most confident: 92%
   - Accuracy on 100 most confident: 73%
   - Accuracy on all matches: 16%

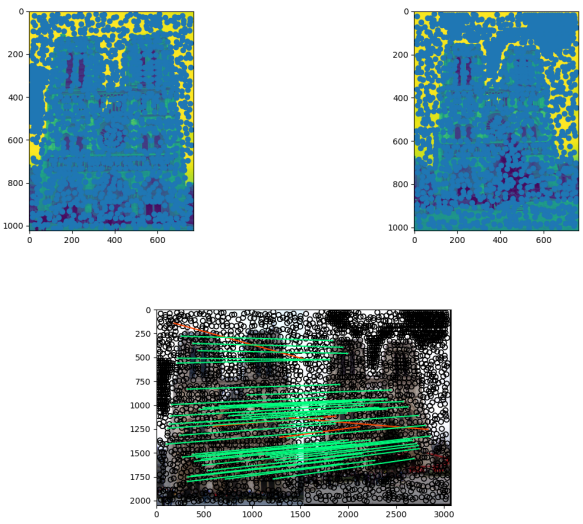

Figure 1: My results for Notre Dame

2. Mount Rushmore
   - Matches: 2022
   - Accuracy on 50 most confident: 78%
   - Accuracy on 100 most confident: 71%
   - Accuracy on all matches: 8%

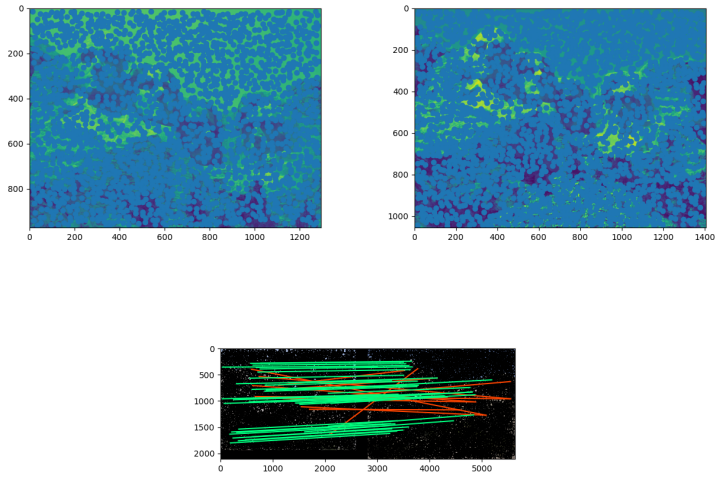

Figure 2: My results for Mount Rushmore