**Exercise 11 - Image Processing**

Author: [Recep Sülüker]

Matrickel-Nr: [2807796]

Date: [19.07.2023]

Part 1:

Part 2: SIFT features

I have used Landsat data from the provided sources (https://landsat.gsfc.nasa.gov/data/where-to-get-data/) for this assignment. The task involved working with two satellite images of the same area, California, USA, taken at different times.

To begin, I followed the provided to-do list step by step. Firstly, I downloaded the images and stored them in the Python code file called "***SIFT.py***". This code file includes the implementation of the SIFT feature detector, which is used to detect keypoints in both images. Additionally, it computes the feature description of the keypoints.

A close-up of a screen

Description automatically generated

After completing the previous steps, I proceeded to the fifth to-do list item. For this, I prepared a Python code file called "***DescriptorMatcher.py***". This file incorporates the Descriptor Matcher and computes correspondences between the features of both images. By utilizing the DescriptorMatcher, the code finds matches between the descriptors obtained from the keypoints in the images.

A graph of matches

Description automatically generated

Finally, I addressed the last item on the to-do list. The code file named "***Best\_K\_Matches.py"*** generates an image that showcases both images with the detected features and matches. To ensure clarity, only the best k matches are shown, where k is chosen to preserve the recognizability of the feature matches. This approach strikes a balance between displaying sufficient detail and maintaining visibility of the features and images.

A close-up of a graph

Description automatically generated

In summary, the code provides a comprehensive visualization of the satellite images, highlighting the detected features and their matches. By adjusting the number of matches displayed, users can control the level of detail while still recognizing the correspondences between the scenes captured in the images.

this is just a sample of training :D

A cat with its eyes wide open

Description automatically generated