BISAG Seminar

14th July, 2014

Pattern Recognition Algorithms

Automating stitching needs identification of common features in the given images and constructing a correspondence function from the matched points.

To find matches, different feature detection algorithms are used.

Popular Feature Detection Algorithms

SIFT : Scale - Invariant Feature Transform

SURF: Speeded-Up Robust Features

Feature Matching

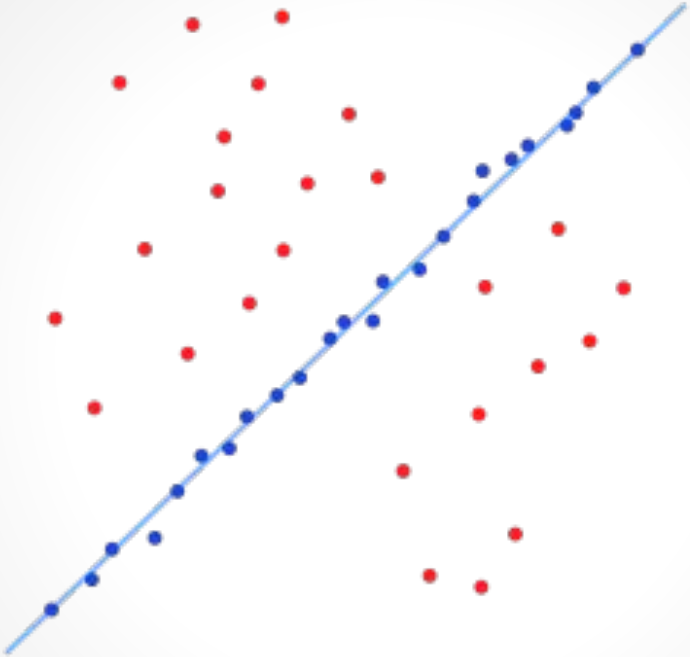
After identifying the features, feature descriptor vectors are built describing the neighbourhood of keypoints.

BF Matcher : Brute Force

FLANN: Fast Library for Approximate Nearest Neighbour

Building the Homography

Using RANSAC: RAndom SAmple Consensus for fitting a Homography to transform the images such that they align with each other.



Problems

- Loss of Data
- Very Slow
- Inaccurate
- Probability based (no guaranteed to work).

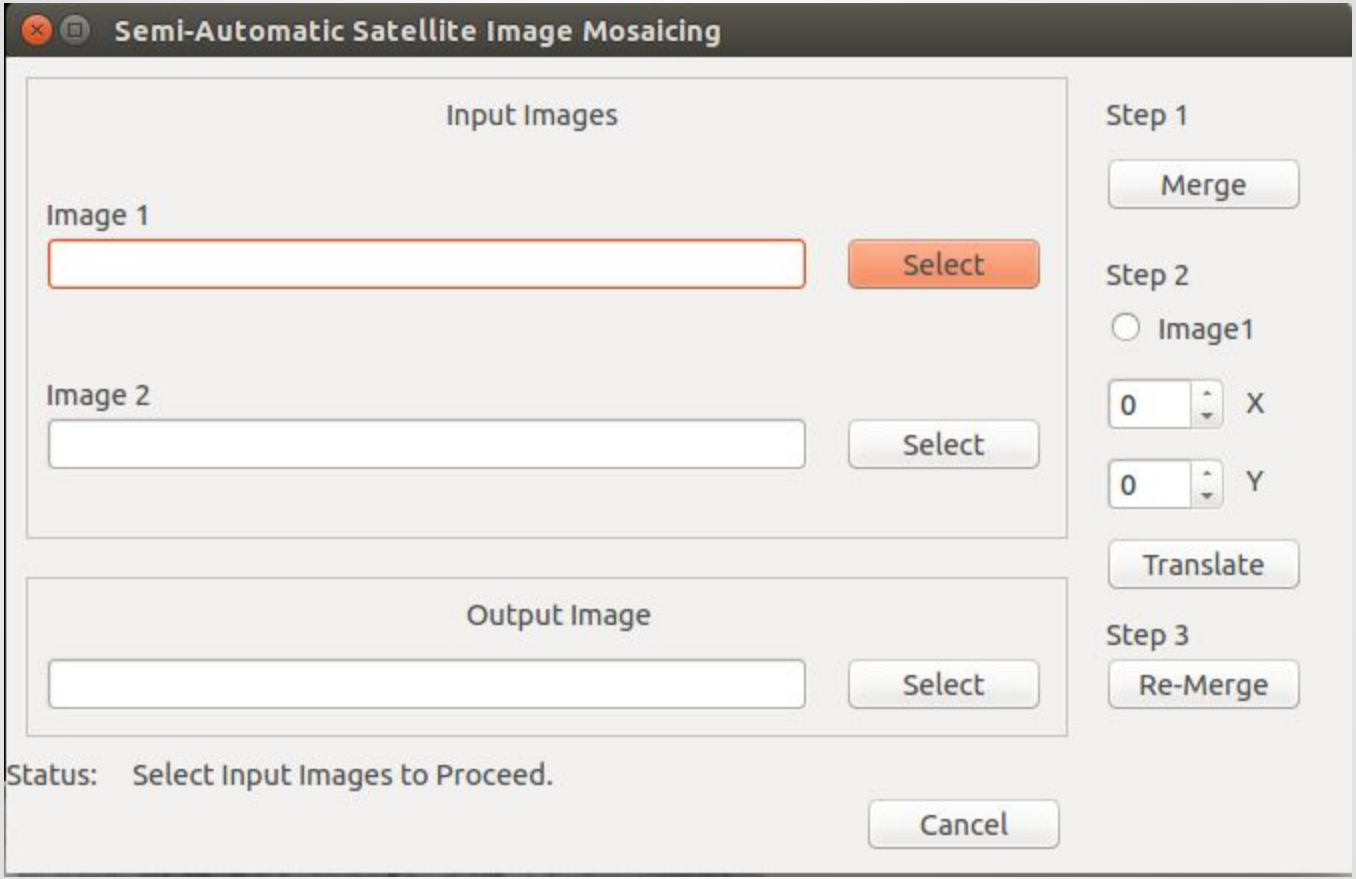
Alternatives

User involvement to reduce the error.

Error modelled by using a linear translation.

Script using GDAL.

GUI built using Qt.


Semi-Automatic Satellite Image Mosaicing
Input Images
Image 1
Select
Image 2
Select
Output Image
Select
Status: Select Input Images to Proceed.
Cancel
Step 1
Merge
Step 2
Image1
0
X
0
Y
Translate
Step 3
Re-Merge