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

Step 1
Merge

Step 2
Image1
0 X
0 Y
Translate

Step 3
Re-Merge

Status: Select Input Images to Proceed.