

User Inputs:

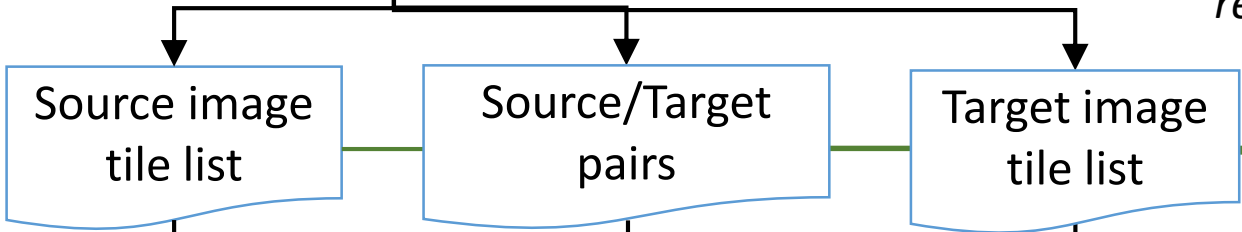


**Phase 1:  
Image Pre-processing**

- Generate source and target pyramids (if needed)\*
- Generate source and target tiles (write if needed)\*
- Generate folders in Scratch directory, store files
- Generate image-to-tile coordinate mapping
- Generate source-to-target tile pairs for matching

*\* Image pyramids and contrast enhancement are implemented, but may or may not be necessary in final implementation. Listed here as optional internal steps to include in final release.*

CSV text files, stored in Scratch directory:

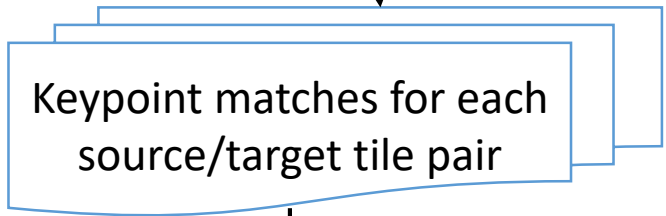


**Phase 2:  
Keypoint Generation**

- Contrast-enhance tiles (if needed)\*
- Generate keypoints on each image tile
- Generate keypoint-matches between source/target tile pairs

*(also uses Source & Target images and pyramids, arrows omitted for simplicity)*

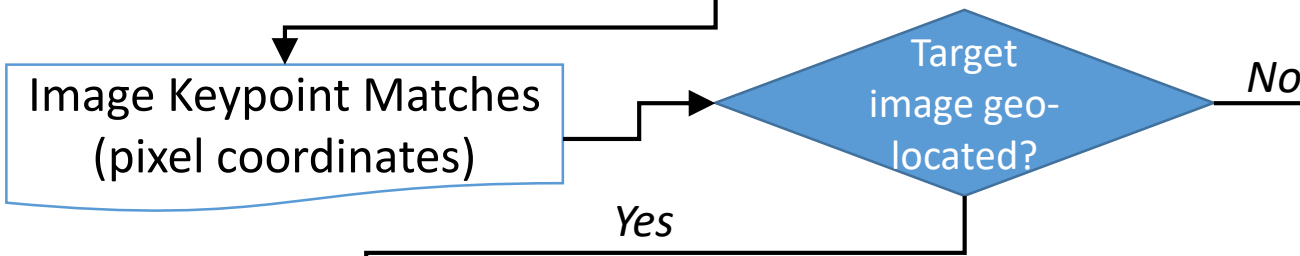
CSV text files, stored in Scratch directory:



**Phase 3:  
RANSAC Filtering**

- Filter keypoint matches for consistent homography
- Combine tile-tile results into image-image results
- Filter image keypoint matches for consistent homography

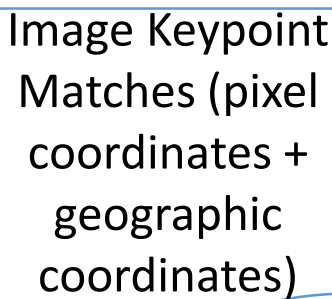
CSV text file, stored in Scratch directory:



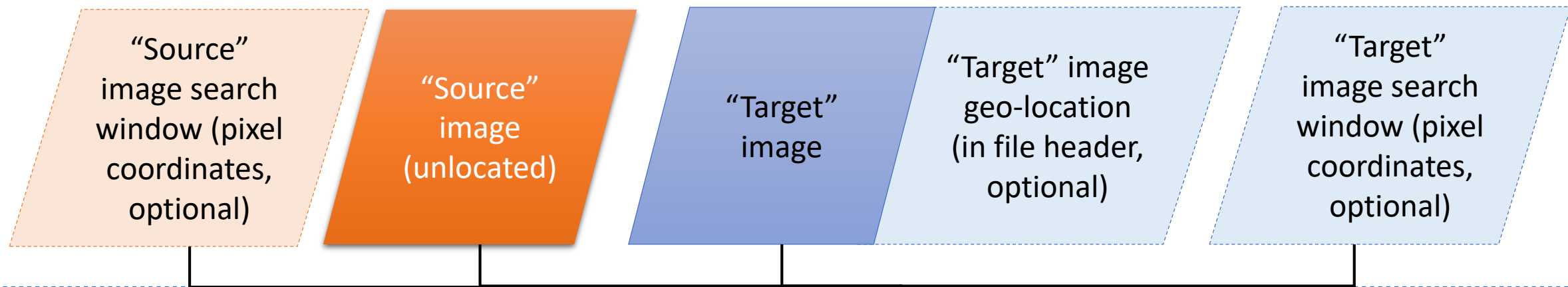
**Phase 4:  
Keypoint Geolocation**

- Retrieve geographic coordinates from pixel coordinates and target image geolocation information

*(also uses Target image, arrow omitted for simplicity)*

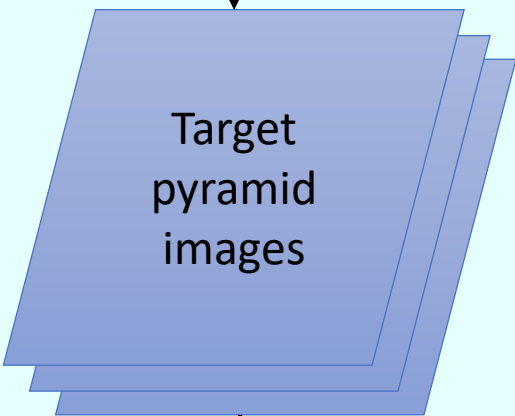
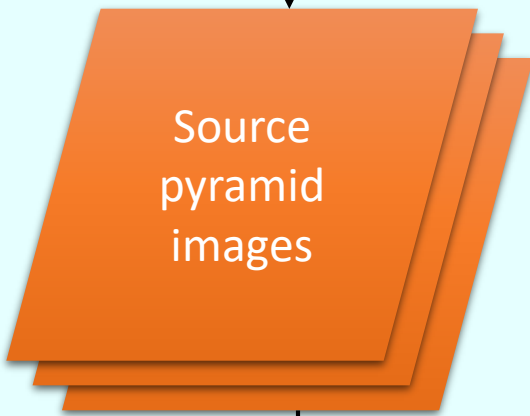


Return Keypoint Matches to user (CSV file, with or without geolocation)



**Phase 1:  
Image Pre-  
processing**

image\_pyramid.py (optional)



tile\_planner.py

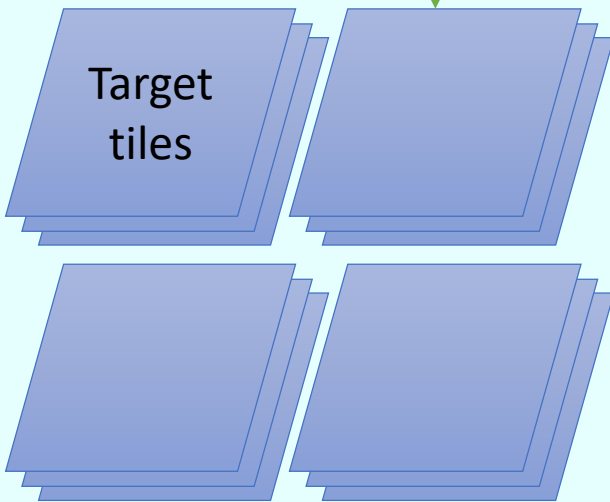
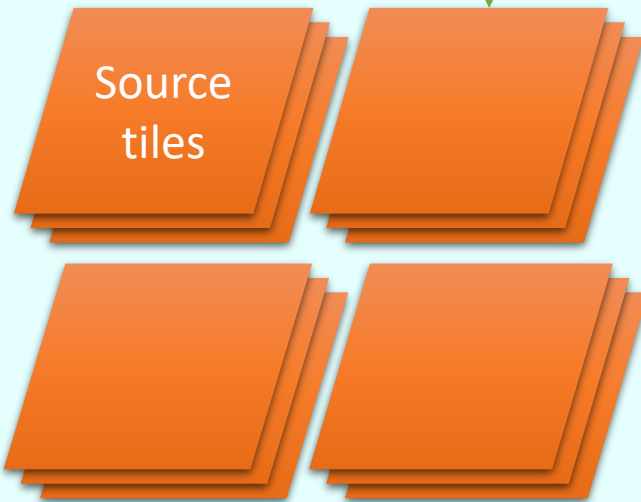
Source tile list

Target tile list

tile\_writer.py (optional)

run\_case\_planner.py

Source/Target  
pairs



Source/Target tiles only need to be written to disk for debugging purposes. tile\_write.py can be unused in release.

Source/Target  
pairs

Source tile list

Target tile list

CSV text files, as well as pyramid & tile output files, are written to the scratch directory, managed by `scratch_directory_manager.py`