Daily Assessment format

Date: 30/06/2020

Name: Jyoth S Donne
USN: 4AL17EC037

Course: IIRS

Topic: Concepts of stereophotogrammetry

Github Repository: jyoth-course

Report

Parallax

→ Apparent shift in the position of object due to shift in the position of observation.

→ Elements of exterior orientation
the collinearity conditions involve 9 unknowns
1 Exposure station attitude (omega, phi, kappa)
2 Exposure station coordinates (X_L, Y_L, Z_L) &
3 object point cordinates (X_A, Y_A, Z_A)
of these, we first need to compute the position & attitude of the exposure station, also known as the elements of exterior orientation.

→ Digitization in 3D: measuring capability
- free-hand device for moving the cursor in the xyz directions.
- used for carrying photogrammetric operations
- features includes a mouse-style trackball for the xy movements & a z-wheel for z movements.

→ Absolute orientation of mobel

purpose
make the reconstructed model fit to the terrain.

Method
transforms coordinates measured in the model to the terrain coordinate systems.

→ Interior orientation

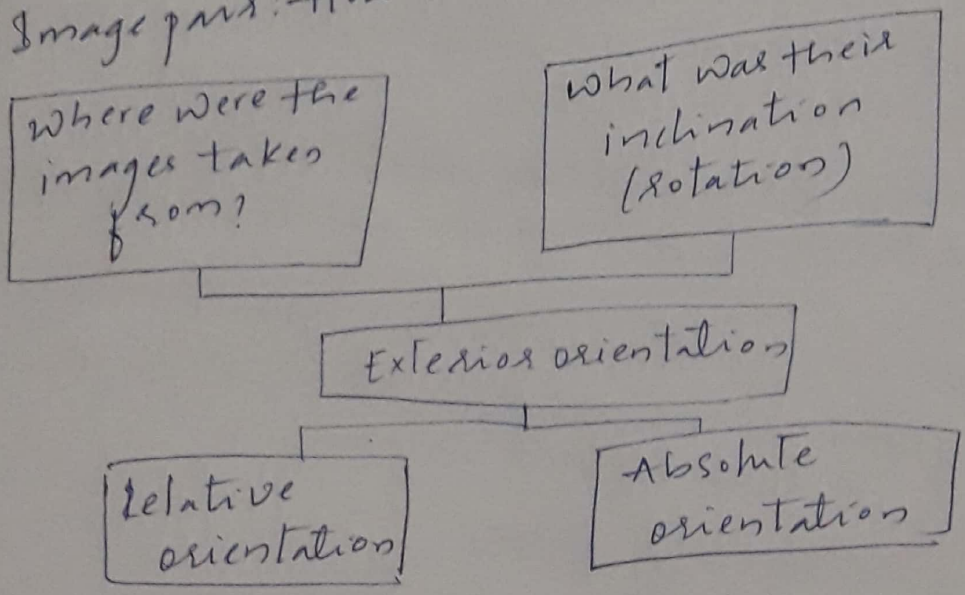
Purpose
allow reconstruction of the bundle of rays, which formed the image.

Method
transform coordinates measured in the image to the camera coordinate system.

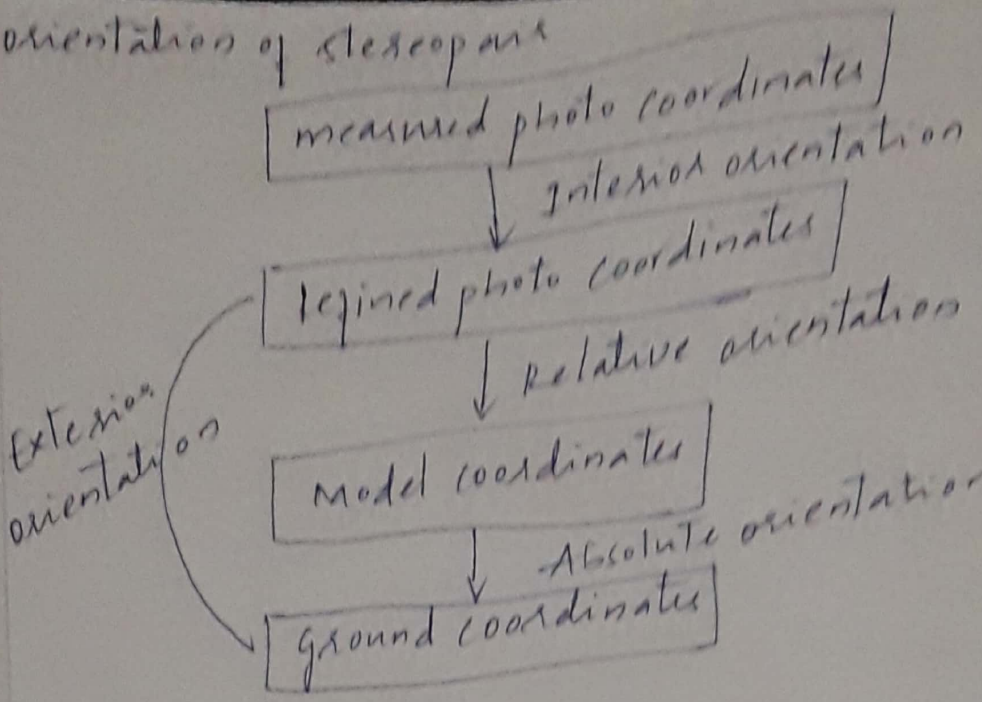
Result
corrected image coordinates

→ Elements of Interior orientation
1 calibrated focal length
2 principal point location
3 fiducial mark coordinates
4 symmetric radial lens coordinates
5 decentering lens distortion.

→ Image pair: How to know?



→ orientation of stereopair



→ stereophotogrammetry
- stereophotogrammetry is the general term applied to the science of measurement from photographs when an overlapping stereopair of photographs is used.
- In contact to single photographs which can only extract 2D information, stereophotogrammetry allows 3D information to be extracted.

→ collinearity condition
→ coplanarity condition
the two exposure stations of a stereopair, any object point & its corresponding image points on two photos all lie in a common plane.

→ Understanding the rotation matrix
→ separation by polarisation
→ viewing stereophotographs in Analog environment
- Three basic types of stereoscopes
pocket,
mirror &
scanning.

→ Split screen viewing
→ viewing stereophotographs in digital environment
Method of stereodisplay in digital environment
- Split screen view
- Anaglyph view
- Separation by polarization
- Alternating Images

→ Depth perception
- methods of judging depth

1 Monoscopic
2 stereoscopic

Monoscopic method
- Relative size of objects
- Hidden objects
- shadows
- Difference in focusing of eye.

→ In the brain