

## DAILY ASSESSMENT REPORT

Date:	30 June 2020	Name:	Gagan M K
Course:	Satellite Photogrammetry and its Application	USN:	4AL17EC032
Topic:	<ul style="list-style-type: none"> <li>Concepts of Stereophotogrammetry</li> </ul>	Semester & Section:	6 <sup>th</sup> sem & 'A' sec
GitHub Repository:	Alvas-education-foundation/Gagan-Git		

### FORENOON SESSION DETAILS

#### Image of session

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Presenter: Dr. Poonam S. Tiwari

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Some StereoView

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**Report – Report can be typed or hand written for up to two pages.**

### **Stereophotogrammetry:**

- Stereophotogrammetry is the general term applied to the science of measurement from photographs when an overlapping stereopair of photograph is used.
- In contrast to single photographs which can only extract 2D information.
- Stereophotogrammetry allows 3D information to be extracted.
- An overlapping stereopair is a pair of photographs on which the same object or area of terrain is pictured, but from different views or perspectives.

#### **Anaglyph viewing:**

- About 3D view
- Multiple glasses are fitted
- We can get 3D model easily

#### **Separation by polarization:**

- Light can be defined in term of practical and also waves
- Vibrates: Non polarized
- Doesn't vibrate :Polarized

#### **Alternating images:**

- Right and left images are differentiated using shutters
- Rotation matrix

#### **Collinearity Condition:**

- The points will be in a straight
- The image should be perfectly oriented

#### **Coplanarity Condition:**

- The exposure stations lie on same plane.

#### **Orientation of stereoplane:**

- Recreate the same condition as existed at the time of photography.
- The present work emphasizes on using collinearity condition, coplanarity condition and DLT method for determining the camera exterior orientation parameters.
- The derivation of the mathematical formulation based on each suggested methods is explained. The comparison of the results of the methods was performed based on accuracy aspects using mathematical and actual photogrammetric data.
- The used data shows that the suggested methods are suitable for camera exterior orientation parameters determination for a block of photographs of any size.
- The results of this investigation prove that the accuracy of using coplanarity equations is slightly better than using collinearity equations or DLT method.
- Although the results of the DLT method are less accurate than those of using collinearity or coplanarity equation, DLT method is essential when the necessary information for the collinearity or coplanarity model is not available.


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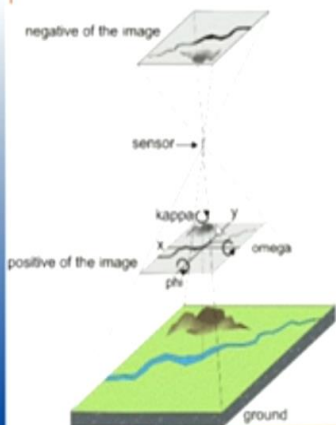
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## Understanding the Rotation Matrix



negative of the image

sensor

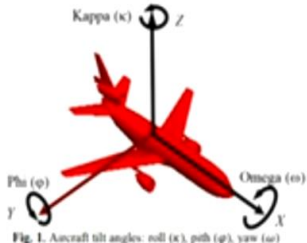
positive of the image

κ (kappa)

φ (phi)

ω (omega)

ground



κ (kappa)


φ (phi)

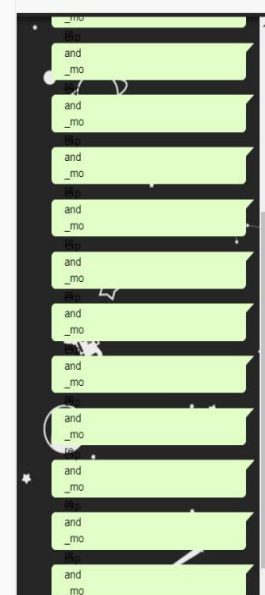
ω (omega)

Fig. 1. Aircraft tilt angles: roll (κ), pitch (φ), yaw (ω)

$$M = \begin{bmatrix} m_{11} & m_{12} & m_{13} \\ m_{21} & m_{22} & m_{23} \\ m_{31} & m_{32} & m_{33} \end{bmatrix}$$

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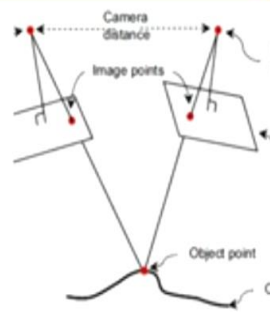
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## Orientation of Stereopair:

Recreating same condition as existed at time of photography





**Unknowns:**

- Image coordinates
- Exposure station Coordinates
- Orientation of photographs

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