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• Concepts of Stereophotogrammetry: by

→ Depth perception:

• Methods of judging depth:

1. Monoscopic.
2. Stereoscopic.

→ Monoscopic method:

1. Relative size of objects.
2. Hidden objects.
3. Shadows.
4. Difference in focusing of eye.

Stereoscopy / Stereovision.

* Stereoscopy is based on stereoscopic or binocular vision.

* Nearer the object - greater the parallax angle and vice a versa.

* Depth cues are given by object sizes, perspective occlusion, movement parallax and change in eye focus.

• Stereophotography depends on distance.

• Three basic types of stereoscopes:

- Pocket.
- Mirror.
- Scanning.

• Viewing Stereophotographs in Digital Environment:

→ Basic requirement for 3D stereo-viewing.

→ Methods of stereo display in digital environment

→ Split Screen View.

→ Anaglyph View.

→ Separation by polarization.

→ Alternating Images.

• Split screen viewing:

• Anaglyph viewing.

• Separation by polarisation:

Left polarisation, right eye sees a dark screen.

→ Right polarisation left eye sees a dark screen.

→ Combined effect → Stereo.

• Stereophotogrammetry is the general term applied to the science of measurement from photographs when an overlapping stereopair of photographs is used.

• Understanding the Rotation Matrix:

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

• Collinearity Condition:

The exposure station of a photograph, an object point and its photo image all lie along a straight line.

• Coplanarity Condition:

The two exposure stations of a stereopair any object point and its corresponding image points on the two photos, all lie in a common plane.

Orientation of Stereopair:

Recreating same condition as existed at time of photography.

Unknowns:

- Image Co-ordinates.
- Exposure Station Co-ordinates.
- Orientation of photographs.

• Interior Orientation:

SUNDAY • Elements of Interior Orientation:

• Exterior Orientation:

① Relative Orientation.

② Absolute Orientation.

- GCP Requirement: (3 GCP per model)
- Digitisation of 3D GIS: