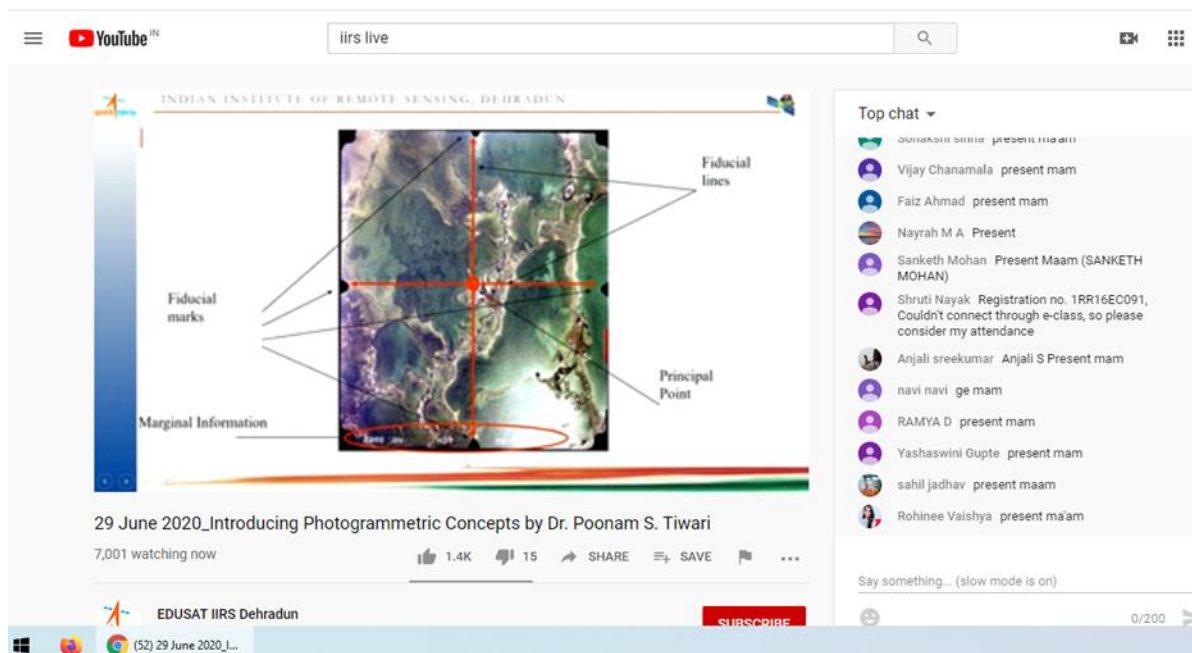


DAILY ASSESSMENT

Date:	29-6-2020	Name:	Kavyashree m
Course:	IIRS	USN:	4a115ec036
Topic:	Introduction to photogrammetry , branches of photogrammetry , types of photogrammetry , software used in photogrammetry , advantages ,applications	Semester & Section:	8 th A
Github Repository:	kavya		

SESSION DETAILS

Image of session



Introduction to photogrammetry

Photogrammetry is the science of making measurements from photographs. Photogrammetry means the measuring of features on a photograph.

This is concerned about metric or measurement aspect of the process. In addition to this photo interpretation aspect is also involved while the technology is used for mapping where feature collection is required.

The fundamental task of metric information is derived through establishing the geometric relationship between the image and the object as it existed at the time of the imaging. Once this is established other information of the object are derived.

Branches of photogrammetry

1. Aerial Photogrammetry: The camera is mounted in an aircraft and is usually pointed vertically towards the ground. Aerial photographs are taken from the air by special camera mounted in an aircraft flying over the area with the camera axis vertical or nearly so. Multiple overlapping photos of the ground are taken as the aircraft flies along a flight path. These photos are processed in a stereo-plotter (an instrument that lets an operator see two photos at once in a stereo view). These photos are also used in automated processing for Digital Elevation Model (DEM) creation.

2. Terrestrial Photogrammetry: is that branch of photogrammetry where photographs are taken from a fixed, and usually known, position on or near the ground and with the camera axis horizontal or nearly so. The position and orientation of the camera are often measured directly at the time of exposure. The instrument used for exposing such photograph is called photo theodolite.

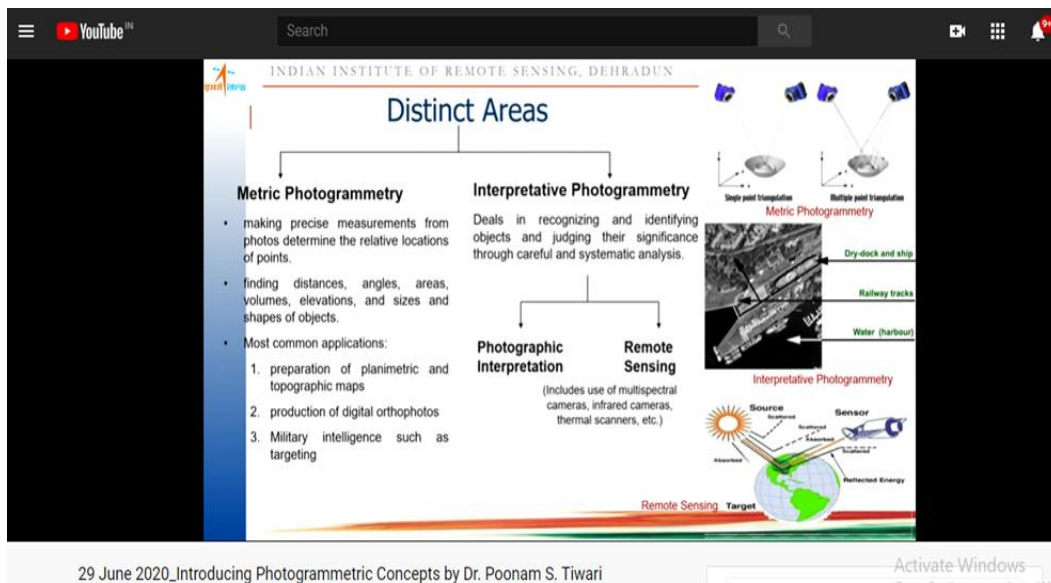
3. Space Photogrammetry: The space photogrammetry embraces all aspects of extraterrestrial photography and subsequent measurement wherein the camera may be fixed on earth, contained in an artificial satellite, or positioned on the moon or a planet. The term photo interpretation is applied to that branch of photogrammetry wherein aerial or terrestrial photographs are used to evaluate, analyze, classify, and interpret images of

objects which can be seen on the photographs. Consequently, photogrammetry must be considered as a combination of measurement and interpretation.

Types of Photogrammetry

There are two types of photogrammetry as follows:

1. Interpretative Photogrammetry.
2. Metric Photogrammetry.
 1. Planimetric mapping.
 2. Topographical mapping.



Interpretative Photogrammetry

Interpretative photogrammetry involves recognizing and identifying objects and judging their significance through careful and systematic analysis from photographic images.

- These images created from satellite imagery which senses energy in wavelengths
- Forms basis for remote sensing (art or science of gathering information about an object or image without actually coming into physical contact).

- Photo interpretation involves in the study of photographic images, while remote sensing involves not only the analysis of photography but also the use of data collected from remote sensing instruments.

Metric Photogrammetry

It consists of making precise measurements on photographs and other information to determine relative locations of points.

- Common application of Metric Photogrammetry consists of planimetric mapping and topographical mapping.
- Applications used to determine distances, elevations, areas, volumes, and cross-sections to compile topographical maps from photographic measurements
- The photographs used for this purpose are mostly aerial photographs, but terrestrial photographs also used sometimes.

Software used in photogrammetry

Agisoft Metashape

Agisoft Metashape, previously named Agisoft Photoscan, is a stand-alone software. This software offers many interesting features like photogrammetric triangulation, point cloud data, measurements for distances, volumes and areas, 3D model generation and textures, for example. Agisoft Metashape appears to be a complete software, useful for various applications such as cultural heritage documentation or visual effects production. You will have the choice between the professional version and the standard version. The standard edition is still quite complete, you will get all the basic software tools that you need! It is one of the most used photogrammetry software tools. If you already used this software before, you should certainly give it another try, because a few improvements have been made, such as processing times and the overall quality of captures.

MicMac

MicMac is an open-source photogrammetry software developed by the IGN (French National Geographic Institute) and ENSG (French national school for geographic sciences). Even if it's a free solution, MicMac is more adapted to experienced or academic users. This software is useful for projects involving environmental protection, cultural heritage imaging and preservation or forestry. From close-range to aerial footage, MicMac can process anything.

Meshroom

Meshroom is a free and open-source software offered by AliceVision, a photogrammetric computer vision framework. This 3D reconstruction software is easy to use, it allows you to run the whole photogrammetric pipeline. You just have to put your images and the software generates 3D models and textured mesh automatically, using a node-based workflow. It cannot be more simple!

3DF Zephyr Free

Here is the free version of the software 3DF Zephyr, a very complete and efficient software for photogrammetry. This software now has a free version specially made for beginners and personal use! It could be the best solution if you are just beginning with this 3D process and need to learn with great software. This free version of 3DF Zephyr is offering all the 3D reconstruction tools and basic editing tools that you will need as a beginner.

Visual SFM

Visual SFM is a 3D reconstruction tool, using structure from motion (SFM). This GUI application is an easy photogrammetry software to use, you will just have to add your

images, match them and make the automatic reconstruction. It is a quite simple software tool with an automatic process.

Colmap

Colmap is a general-purpose Structure-from-Motion (SfM) and Multi-View Stereo (MVS) pipeline. You can use it with its graphical user interface, or with its command-line interface. You can choose what is more convenient for you. You will access all the basic tools needed to create a 3D model using one or several photographs.

Regard3D

Regard3D is a free and open-source structure-from-motion program, allowing you to generate great 3D models from a series of photographs. This program is offering powerful tools and it might take you a while to really master it. All the tutorials available on their website are really useful to get started.

Advantages of Photogrammetry

1. Cover areas quickly.
2. Low costs.
3. Easy to obtain/access information from air.
4. Illustrates great detail.

Applications of Photogrammetry

1. To prepare planimetric topographical maps (Surveying/mapping).
2. To determine the space position of ground objects.
3. For acquisition of military intelligence (Military/artificial intelligence).
4. To classify soil (Forestry/agriculture).
5. For the interpretation of geology (Geology/archaeology).

6. Assessment of crop damage due to floods or other natural calamities.
7. To prepare a composite picture of ground.
8. To relocate existing property boundaries.
9. In the field of medicine.