

# **‘Photogrammetry’**

## **Lecture-1**

### **Introduction to photogrammetry**

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## **Outline**

- **Definition of photogrammetry**
- **Why photogrammetry?**
- **Type of photogrammetry?**
- **History of photogrammetry**
- **Who uses photogrammetry?**
- **Objective of photogrammetry**
- **Principal of photogrammetry**

## ➤ Definition of photogrammetry

**Photogrammetry:** It is the art, science and technology of obtaining reliable information about physical objects and the environment through processes of recording, measuring, and interpreting photographic images and patterns of recorded radiant electromagnetic energy and other phenomena

- ❖ The origin of the word of photogrammetry is derived from three Greek words
- Phot or phos: means light (that comes from the object).
- Gramma: which means letter or something written or drawn.
- Metrein: it means that measurements.

## ➤ Why photogrammetry?

- Photogrammetry, used to obtain reliable measurements (XYZ) and produce planimetric and topographic maps from two dimensional images.
- photographs, without going to the field, it measure the objects.
- Photogrammetry products (e.g. maps) are considered as the reference for most GIS applications.
- Specified to cover large area quickly.
- Specified to be lower cost than others (e.g. geodetic survey).
- The data can be obtained easier from image than the fields.

## ➤ Type of photogrammetry?

### ❖ Space Imagery



### ❖ Terrestrial (Close Range) Imagery



### ❖ Aerial Imagery



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## ➤ History of photogrammetry

Developed at the same time of developing photography in 1851 by Aimé Laussedat, French inventor. The development started with:

- **Plane table photogrammetry:** consists essentially in taking a photograph of the area to be mapped from each of the two or three stations
- **Analogue photogrammetry:** the imaging geometry is reconstructed through optical or mechanical devices.



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- **Analytical photogrammetry:** is a term used to describe the rigorous mathematical calculation of coordinates of points in object space based upon camera parameters, measured photo coordinates, and ground control.
- **Digital photogrammetry:** is a well-established technique for acquiring dense 3D geometric information for real-world objects from stereoscopic image overlap.

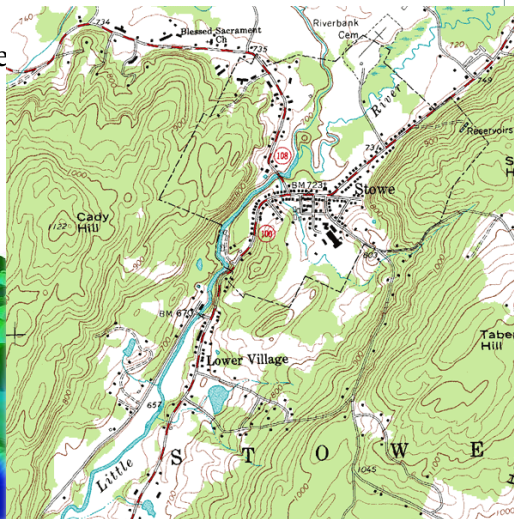
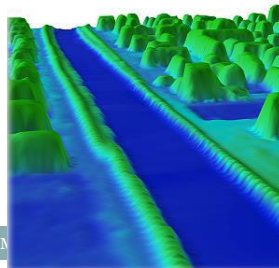


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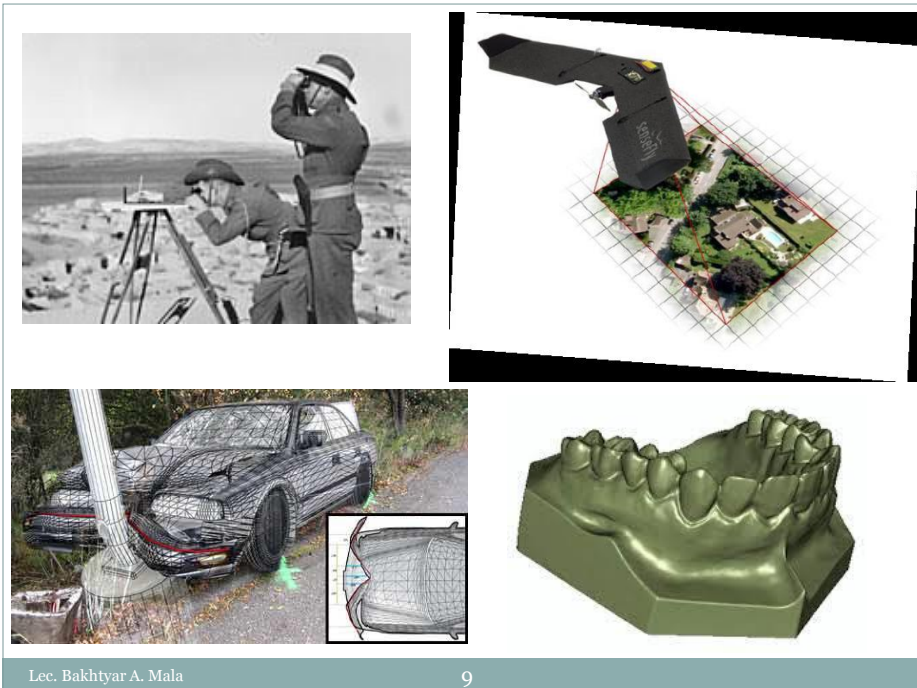
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### ➤ Who uses photogrammetry?

- Geology/archeology
- Forestry/agriculture
- Military/artificial intelligence
- Surveying/mapping
- Forensic investigation
- Medical treatment



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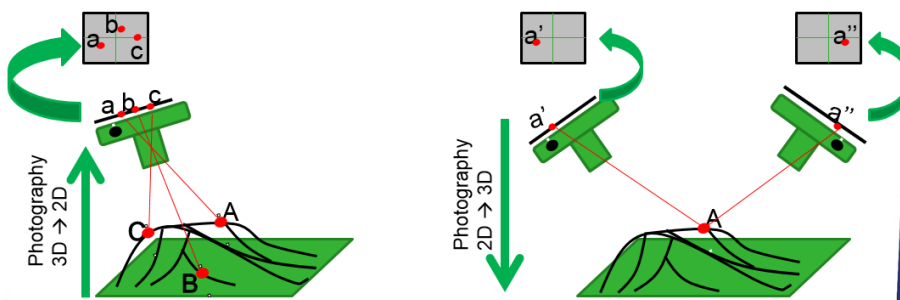


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## ➤ Objective of photogrammetry

It is the technique that Inverse the process of photography, in order to generate object space from the imagery, consequently lead to derive 3D coordinates from 2D coordinates.



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### ➤ Principal of photogrammetry

The fundamental principle used by photogrammetry is triangulation. By taking photographs from at least two different locations, so-called “lines of sight” can be developed from each camera to points on the object.

The human visual system uses image matching for tasks like depth perception and object recognition.

