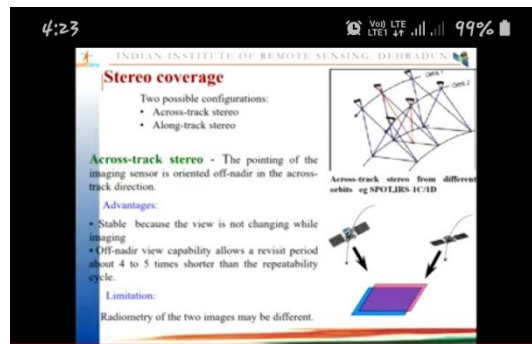


## DAILY ASSESSMENT FORMAT

Date:	01-07-2020	Name:	Kavyashree m
Course:	IIRS	USN:	4a115ec036
Topic:	Concepts of Satellite Photogrammetry	Semester & Section:	8 <sup>th</sup> A
Github Repository:	kavya		

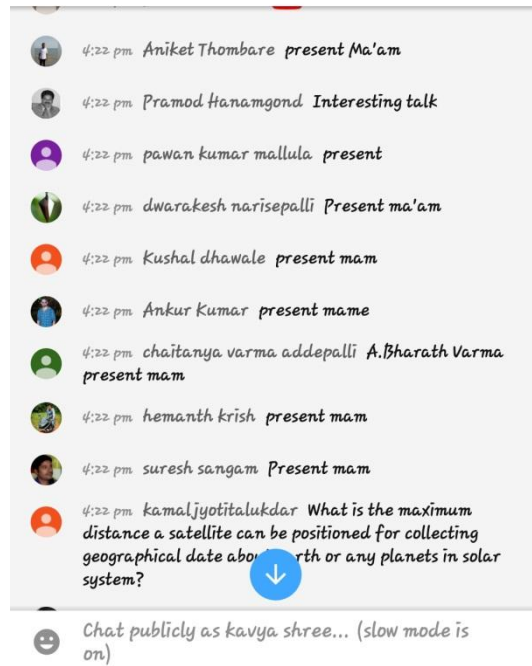
### FORENOON SESSION DETAILS

#### Image of session



#### Live chat

Top chat 5.3K



## **Satellite photogrammetry**

Satellite imagery forms one of the basic tools for remote sensing. The types of satellite images available to the geologist, environmental scientist, and others are expanding rapidly,

### **Key concepts:**

- Spatial resolution.
- Radiometric resolution.
- Spectral resolution.
- Temporal resolution
- Spatial resolution describes the ability of a sensor to identify the smallest size detail of a pattern on an image. In other words, the distance between distinguishable patterns or objects in an image that can be separated from each other and is often expressed in meters.
- Spectral resolution is the sensitivity of a sensor to respond to a specific frequency range. The frequency ranges covered often include not only visible light but also non-visible light and electromagnetic radiation. Objects on the ground can be identified by the different wavelengths reflected (interpreted as different colours) but the sensor used must be able to detect these wavelengths in order to see these features.
- Radiometric resolution is often called contrast. It describes the ability of the sensor to measure the signal strength or brightness of objects. The more sensitive a sensor is to the reflectance of an object as compared to its surroundings, the smaller an object that can be detected and identified.

Temporal resolution depends on several factors—how long it takes for a satellite to return to the same location in space, the swath of the sensor, and whether or not the sensor can be directed off-nadir. This is more formally known as the ‘revisit period’

## **DIGITAL PHOTOGRAMMETRY**

- Digital photogrammetry is applied to digital images that are stored and processed on a computer
- Digital photogrammetry is sometimes called softcopy photogrammetry
- The output products are in digital form, such as digital maps, DEMs, and digital orthophotos saved on computer storage media

## **STANDARD REQUIREMENTS:**

- Handling Image Display
- Measurement
  - Recording Pixel Coordinates
- Determination of Orientations
  - Inner Orientation including Calibration parameters
  - Relative and absolute orientations, Bundle Adjustment –
- Transformations
- Image Processing Functions
  - Image Matching
  - Edge Detection
- Digital Rectification
- Visualization

## **OPEN SOURCE SOFTWARE ENABLING PHOTOGRAMMETRIC PROCESSING:**

- ILWIS(Integrated Land and Water Information System) -

- stereoscopy, anaglyph and photogrammetry tools
- E-foto
- OSSIM: Open Source Software Image Map

## **ADVANTAGES OF IMAGING FROM SPACE:**

- Synoptic view
- Large swath, reactivity
- Constant scale, near orthonormal projection
- Negligible internal distortions
- Stable radiometry
- Formalities associated with aerial photography and flight arrangement are avoided here

## **STEREO IMAGING & TOPOGRAPHIC MAPPING**

- Stereo satellite images are captured
  - consecutively by a single satellite along the same orbit within a few seconds
  - by the same satellite (or different satellites) from different orbits in different dates
- The base-to-height (B/H) ratio should be close to 1 for high-quality stereo model with high elevation accuracy.
- Optimum base to height ratio is 0.6 to 1.0
- Atmospheric effects (refraction, optical thickness) become more significant at higher look angles
- Light rays in a bundle defined by the sensor are almost parallel- lessening the importance of the satellite's position

- The inclination angles of the cameras onboard the satellite become the critical data.
- Inclination is the angle between a vertical on the ground at the center of the scene and a light ray from the exposure station
- This angle defines the degree of off-nadir viewing when the scene was recorded
- The cameras can be tilted in increments of a minimum of 0.6 to a maximum of 27 degrees to the east (negative inclination) or west (positive inclination)
- A stereo scene is achieved when two images of the same area are acquired on different days from different orbits, one taken East of the other. For this to occur, there must be significant differences in the inclination recorded angles