

# DAILY ASSESSMENT FORMAT

Date:	03-07-2020	Name:	Roshni A B
Course:	IIRS Outreach Programme	USN:	4AL17EC080
Topic:	Satellite Photogrammetry and its Applications	Semester & Section:	6th SEM & 'B' SEC
Github Repository:	Roshni-online		

## FORENOON SESSION DETAILS

### Image of session

The screenshot shows the IIRS E-CLASS live session interface. The main content area displays a presentation slide titled "Uses of DEM" by Dr. Anil Kumar, listing various applications like contour lines, orthophoto generation, and slope models. A video feed of the presenter is visible in the bottom right. The left sidebar shows navigation options like Live Session, Offline Session, Study Material, Attendance Status, Course Guidelines, and Feedback. The right sidebar shows a chat window with messages from participants like Saksham Raj, MANAN NEEMA, and Ayush Choudhary.



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**E-CLASS**  
ELECTRONIC COLLABORATIVE LEARNING AND KNOWLEDGE SHARING SYSTEM

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Presenter: Dr. Anil Kumar Live Now

### DEM Precision

INDIAN INSTITUTE OF REMOTE SENSING, DEHRADUN

0.1 m precision  
0% 17%

1.0 m precision  
0%

Ask Question

Saksham Raj  
Present sir 3:55 PM

MANAN NEEMA  
good afternoon everyone 3:55 PM

Ayush Choudhary Choudhary  
Watch offline lecture to get the attendance 3:55 PM

Vaishnavi M  
Watch offline lectures you will get the attendance ...  
Nihal Tadakamadadi  
I watched but i did not

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### Automatic DTM Point Collection

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**Least Squares Correlation:**  
When least squares correlation fits a search window to the reference window, both radiometric (pixel gray values) and geometric (location, size, and shape of the search window) transformations are calculated.

Where:  
 $c_r, r_r$  = the pixel coordinate in the reference window  
 $c_s, r_s$  = the pixel coordinate in the search window  
 $g_r(c_r, r_r)$  = the gray value of pixel  $(c_r, r_r)$   
 $g_s(c_s, r_s)$  = the gray value of pixel  $(c_s, r_s)$   
 $a_0, a_1, a_2$  = linear gray value transformation parameters  
 $b_0, b_1, b_2$  = affine geometric transformation parameters

Based on this assumption, the error equation for each pixel is derived, as shown in the following equation:  

$$v = (a_1 + a_2 c_1 + a_3 r_1) g_c + (b_1 + b_2 c_1 + b_3 r_1) g_r - b_1 - b_2 g_s(c_s, r_s) + \Delta g$$
 with  $\Delta g = g_s(c_s, r_s) - g_r(c_r, r_r)$   
 where  $g_r$  and  $g_s$  are the gradients of  $g_s(c_s, r_s)$ .

$$g_s(c_s, r_s) = h_0 + h_1 g_r(c_r, r_r)$$
  

$$c_s = a_0 + a_1 c_1 + a_2 r_1$$
  

$$r_s = b_0 + b_1 c_1 + b_2 r_1$$

Ask Question

please watch class in offline in e-class portal and attendance will be updated 3:55 PM

JYOTHI K G  
Good evening sir 3:55 PM

KARAN JADAV  
Present 3:55 PM

Archanaa P  
Sir today is the last session of this course 3:55 PM

afroz basha shaik  
I have attended all sessions but not sir





Hemalatha Dand  
HALITEC035  
6 Sem, A Sec

papergrid

Date: / /

## SIRS Outreach programme

### Satellite Photogrammetry & its applications

Days: 03/07/2020 - Friday

Dr. Anil Kumar

#### Uses of DEM

- Derivation of contour lines
- Orthorectification
- Prediction of visibility

#### Automatic DSM Point Collection

##### Image Matching Techniques

- > Area - based matching
- > Feature based matching
- > Relation based matching

#### Automatic DSM Point Collection

##### Least square correlation

##### Feature based matching

- Feature based matching determines the correspondence between two image patches

#### Ortho rectification

#### Planimetrically correct Orthorectified



## > Advantages of use of Digital Orthophotos

### Input of generating an Orthophoto

The input data required for the orthophoto generation using aerial photographs (Aerial photography):

- > Photo length
- > Lens distortion
- > Fiducial marks coordinates
- > Ground

### • Least square correlation:

When least square correlation is used, each window to the reference window, both coordinates (pixel values) & geometry (location, size & shape of the search window) transformation are calculated.

- Product which can be readily interpreted like a photograph.
- Product in which data distortions, angles & area can be measured & mapped in digital format.

