DAILY ASSESSMENT

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Course:	IIRS	USN:	4al15ec036
Topic:	Concepts of stereophotogrammetry	Semester & Section:	8th A
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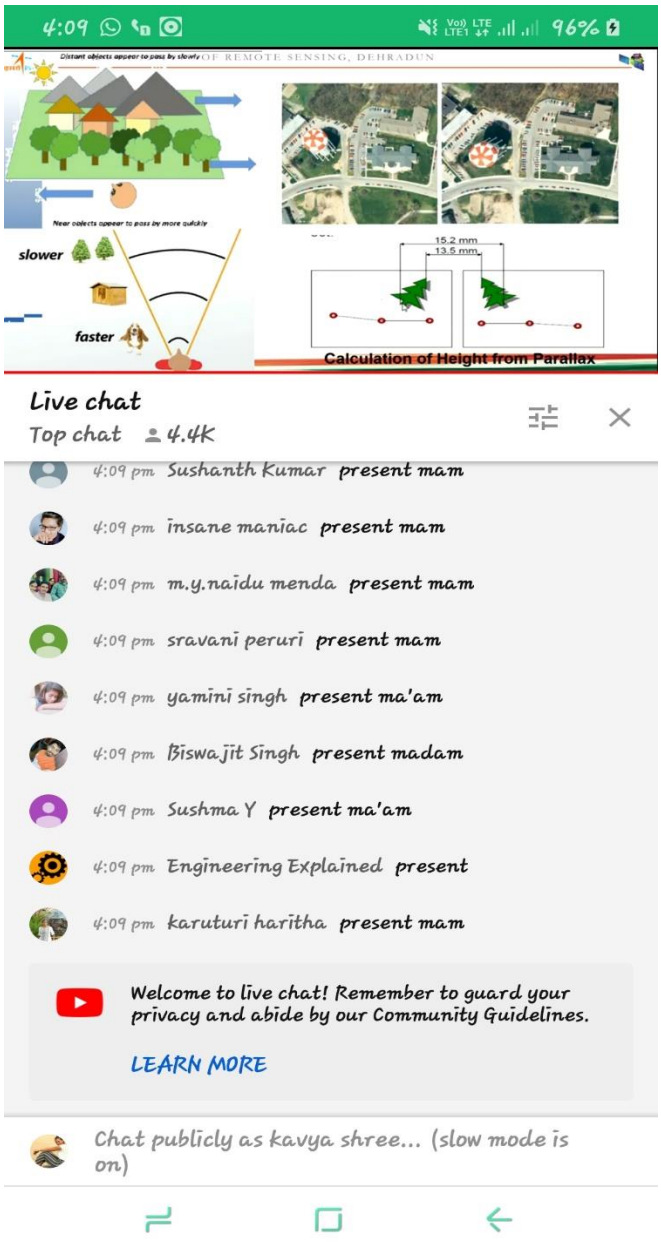
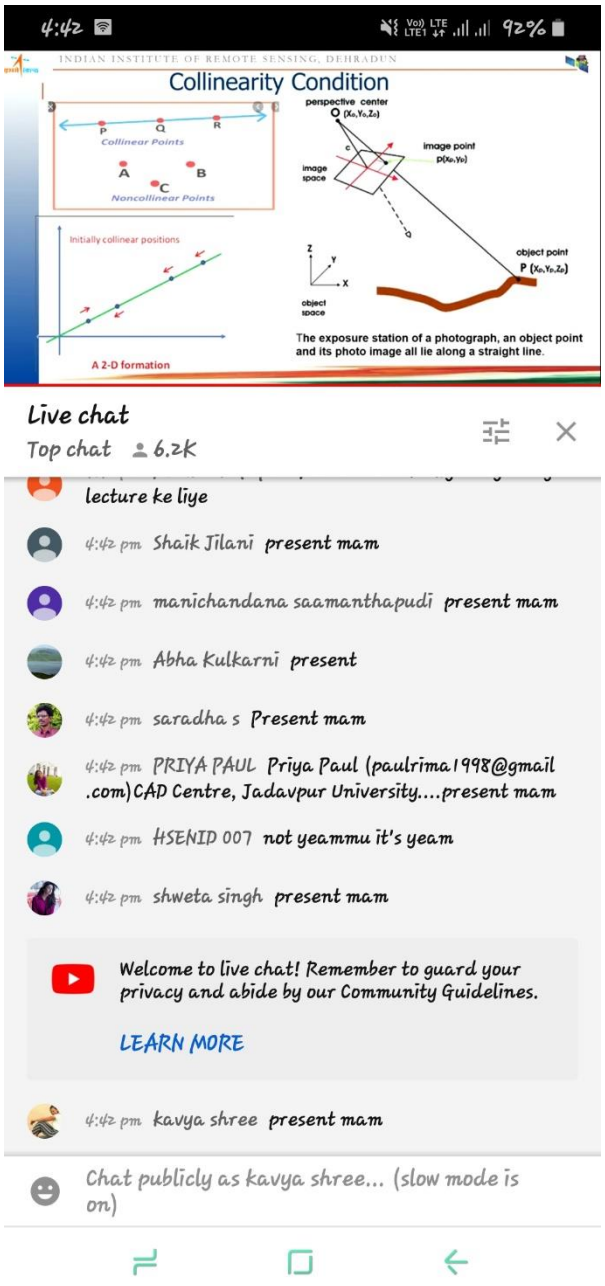
SESSION DETAILS
Image of session





Concepts of stereophotogrammetry

The introduction of 3D stereophotogrammetry (3D camera technology) provides a practical method for objectively comparing surgical results. Stereophotogrammetry involves estimating the 3D coordinates of points on an object (the face, in our case),

employing measurements made in two or more photographic images taken from different positions. The image is calculated from a collection of points obtained along an x, y, and z coordinate system. The data, besides rendering a 3D image, is easily obtained and, thanks to included software, can be utilized to perform anthropometric analyses of facial soft tissue landmarks with a reliability of less than 1 mm.[41]

This technology offers a unique tool in the field of FGCS for visual communication with the patient and makes it possible to enhance the process of clinical documentation. Thanks to 3D simulation and evaluation tools, the patient's own image can be used to explore possible outcomes, educate them about their options, explain limitations, and establish appropriate expectations.

In some cases, we recommend the use of stereolithographic 3D models to improve preoperative planning as the standardized incorporation of 3D printing is an important advance in diagnosis. The 3D printing of CT scans of skulls allows for model surgery to be practiced, which enables surgeons to refine the precise procedures that should be performed on the patient on the day of surgery. The combination of 3D technologies, facial scanning, and skull printing allow for a high standard of surgical planning

A special case, called stereophotogrammetry, involves estimating the three-dimensional coordinates of points on an object employing measurements made in two or more photographic images taken from different position . Common points are identified on each image. A line of sight can be constructed from the camera location to the point on the object. It is the intersection of these rays that determines the three-dimensional location of the point. More sophisticated algorithms can exploit other information about the scene that is known a priori, for example symmetries, in some cases allowing reconstructions of 3D coordinates from only one camera position. Stereophotogrammetry is emerging as a robust non-contacting measurement technique to determine dynamic characteristics and mode shapes of non-rotating and rotating structures.

Mapping

Photomapping is the process of making a map with "cartographic enhancements" that have been drawn from a photomosaic that is "a composite photographic image of the ground" or more precisely as a controlled photomosaic where "individual photographs are rectified for tilt and brought to a common scale" .

Rectification of imagery is generally achieved by "fitting the projected images of each photograph to a set of four control points whose positions have been derived from an existing map or from ground measurements. When these rectified, scaled photographs are positioned on a grid of control points, a good correspondence can be achieved between them through skillful trimming and fitting and the use of the areas around the principal point where the relief displacements are at a minimum."

"It is quite reasonable to conclude that some form of photomap will become the standard general map of the future." go on to suggest that, "photomapping would appear to be the only way to take reasonable advantage" of future data sources like high altitude aircraft and satellite imagery. The highest resolution aerial photomaps on GoogleEarth are approximately 2.5 cm (0.98 in) spatial resolution images. The highest resolution photomap of ortho images was made in Hungary in 2012 with a 0.5 cm (0.20 in) spatial resolution.

How To Make a 3D Model from Photos in 5 Easy Steps

The scanning app that is mentioned in this blog post is not available for download anymore.

Looking for turning a photo into a 3D model? You can easily create 3D printable objects and 3D models from images and photos nowadays. In this tutorial, we will show you how you can turn ordinary 2D pictures of everyday objects into extraordinary 3D models. Turning 2D into 3D has never been easier as this project requires no coding

experience and runs 100% on free software. If you think about 3D printing these 3D models, you don't even have to buy a 3D printer and you can do it all without leaving your house.

Step 1: Capture the object through Digital Phot**os.**

The first step is to capture your object by taking pictures of it. These images will serve as the foundation for the rest of your project and will later become a 3D model. You can do this step either with a digital camera or your mobile phone.

In order to make a 3D print based on photos, we first need to get the right images.

- Place your object in the middle and take photos in a loop, moving completely around the object.
- Shoot another loop from a different angle to make sure you cover the top of the object. Aim for 30-40 total sequential photos.
- For best results, add newspaper or sticky notes around your subject to help 3D building software distinguish where the bottom is.
- Try to maintain consistent lighting, object position and focus in all pictures.
- Avoid overexposed or underexposed photos.
- Avoid plain, reflective, transparent surfaces and objects. They don't make good 3D models.

Step 2: Create a 3D Model from Photos.

Upload your images to Autodesk 123D Catch

Autodesk's 123D Catch is a free tool which will help you piece together your 3D model from the pictures you just took. 123D Catch will automatically identify common features from your photographs and convert them into a single 3D design. Your model will be uploaded and saved to Autodesk's cloud storage.

Step 3: Review and clean up your 3D model.

Give yourself a pat on the back for making it this far, you're halfway through. The next step is to clean up and fix any errors your model might have in 123D Catch. Sometimes the pictures capture extra elements that you don't want to be included in your model, but you can clean it up with the "lasso" and "heal" tools. The lasso tool will help you select and remove unwanted areas. The heal tool will help you fill in any holes in your model and fix them.

Step 4 : Edit your 3D Model and Tap into Your Creative Spark

Is your model missing something? Want to add wings or robot arms? Take it to the next level with Autodesk sister app Meshmixer which allows you to mix , mash, mix, sculpt, stamp or paint 3D designs super easily, starting from over 10,000 models in the Gallery.

Step 5: 3D Printing Based on your Images: Print your 3D Model with i.materialise.

We are ready to print! When you're happy with your model, click on the 123 Catch drop down menu in the top left and select "Export STL" which will generate your 3D model file in a format 3D printers understand.