



Technical Design Photogrammetry

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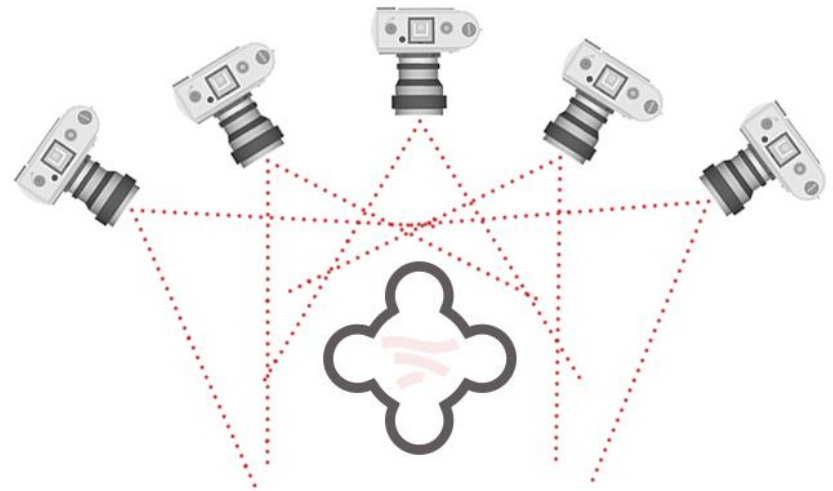
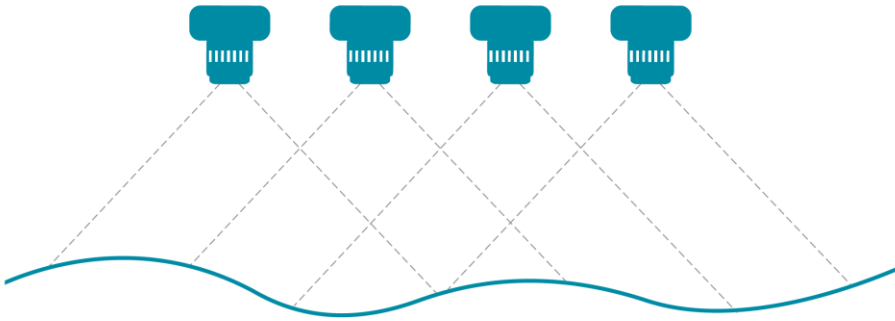
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Photogrammetry

Photogrammetry is the science of making measurements from photographs.

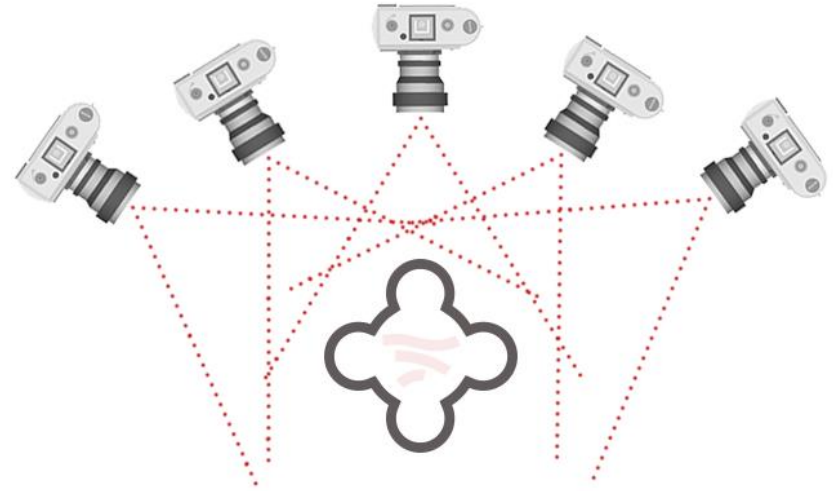
The input to photogrammetry is photographs, and the output is typically a map, a drawing, a measurement, or a 3D model of some real-world object or scene. Many of the maps we use today are created with photogrammetry and photographs taken from aircraft.



Photogrammetry

Benefits

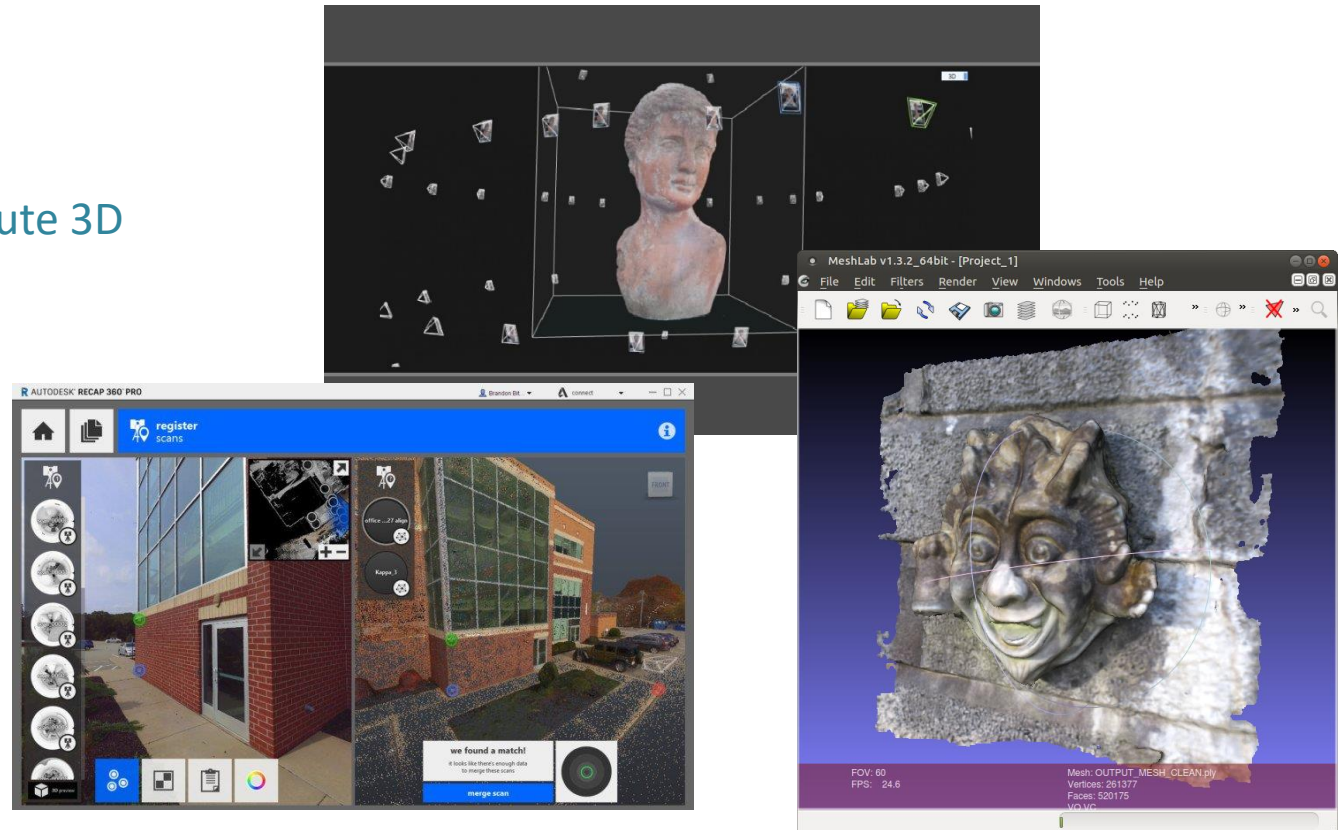
- **Speed.** From start to finish, photogrammetry projects move faster.
- **Cost savings.** When all costs are considered, photogrammetry projects tend to be less expensive.
- **Comfort.** Photogrammetry requires you to spend less time in the field.
- **Flexibility.** No project is too large or too small for photogrammetry.



Photogrammetry

- Software platforms

- Context Capture & Acute 3D
- PhotoModeler
- PhotoScan
- Pix4dMapper
- Reality Capture
- Recap photo
- 3DF Zephyr



Photogrammetry

Types of Photogrammetry

Photogrammetry can be classified several ways but one standard method is to split the field based on camera location during photography. On this basis we have Aerial Photogrammetry, and Terrestrial (or Close-Range) Photogrammetry.

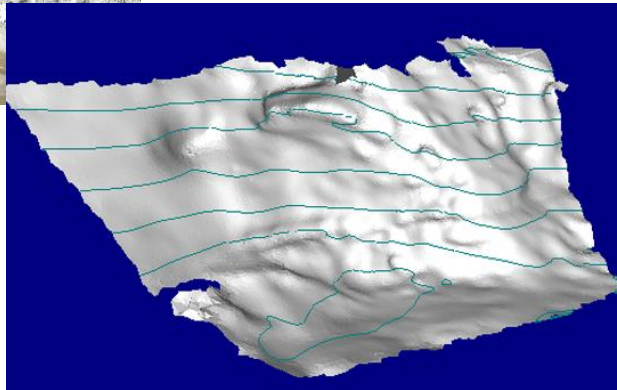
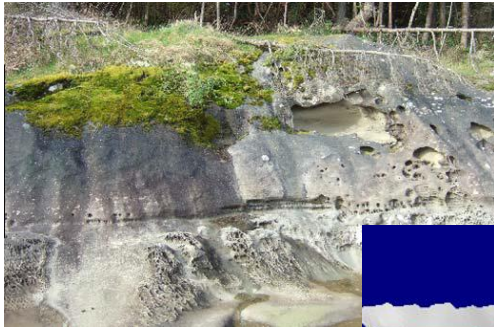
Aerial Photogrammetry, the camera is mounted in an aircraft and is usually pointed vertically towards the ground. Multiple overlapping photos of the ground are taken as the aircraft flies along a flight path. Works in conjunction with GPS systems

Terrestrial and Close-range Photogrammetry, the camera is located on the ground, and hand held, tripod or pole mounted. In the computer vision community, this type of photogrammetry is sometimes called Image-Based Modeling

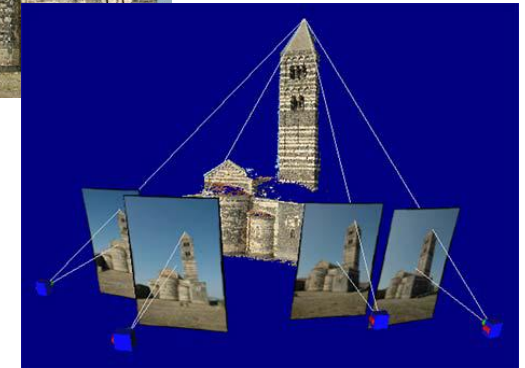
Photogrammetry

Areas using photogrammetry

Topographic - products like terrain models or topographic maps



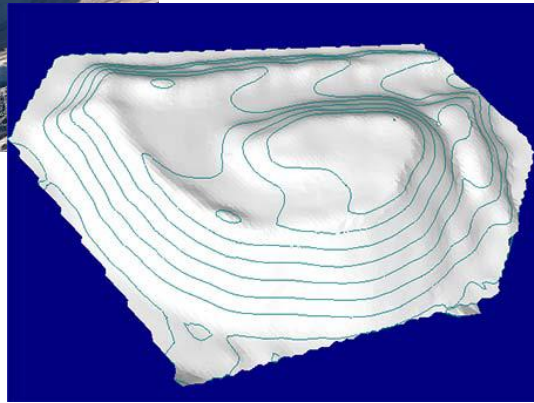
measure buildings - engineering structures



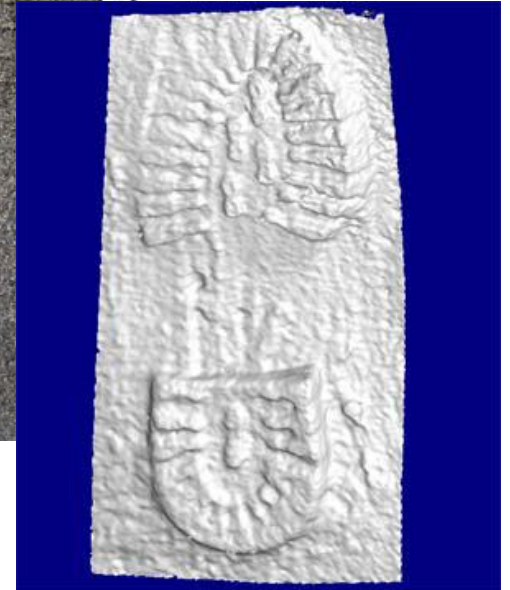
Photogrammetry

Areas using photogrammetry

Mines - earth-works, stock-piles



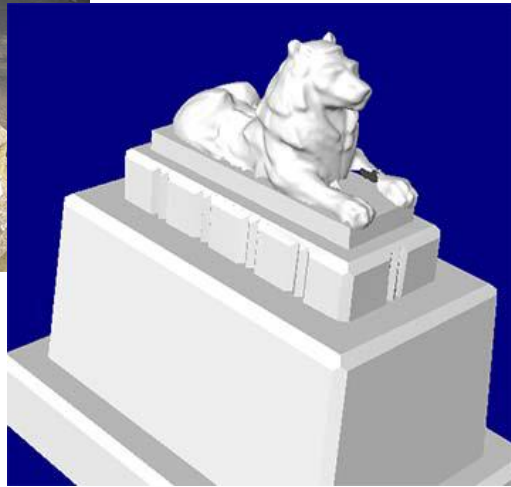
Forensic - accident scenes



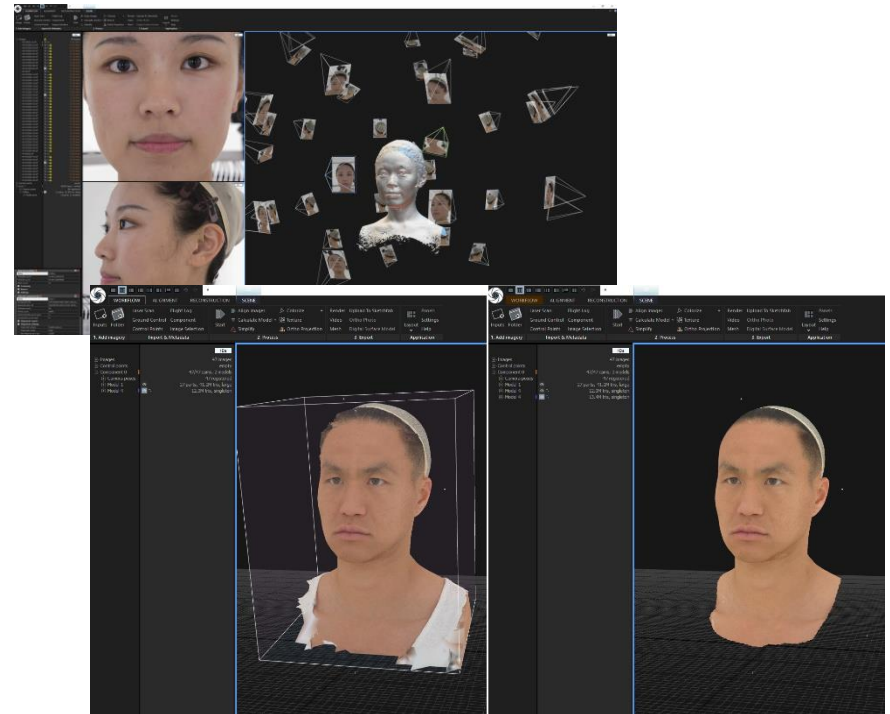
Photogrammetry

Areas using photogrammetry

Archaeological – artefacts



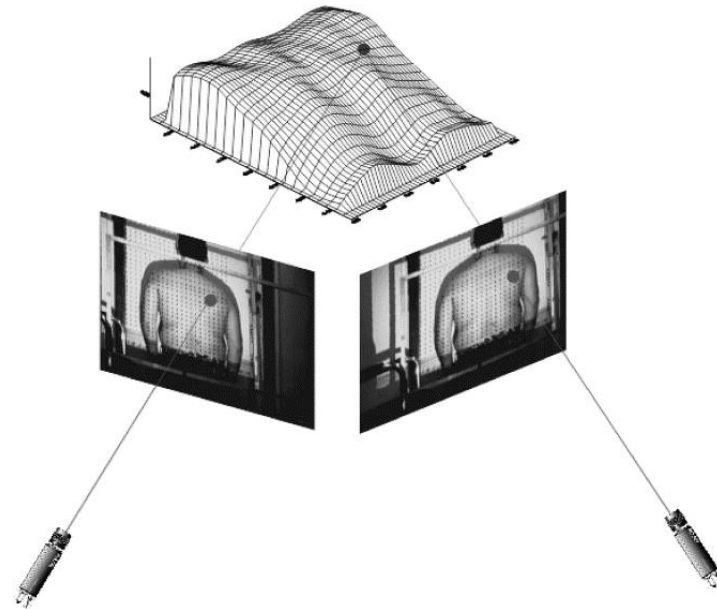
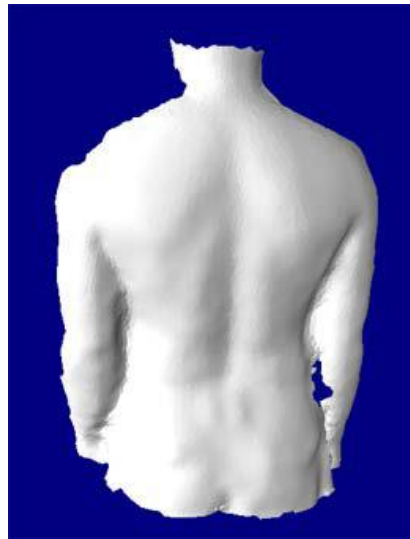
film sets – animation and games



Photogrammetry

Areas using photogrammetry

Medical



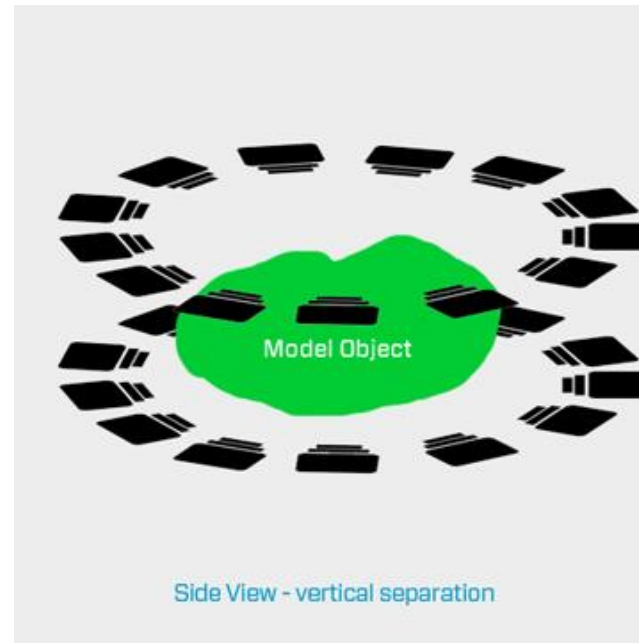
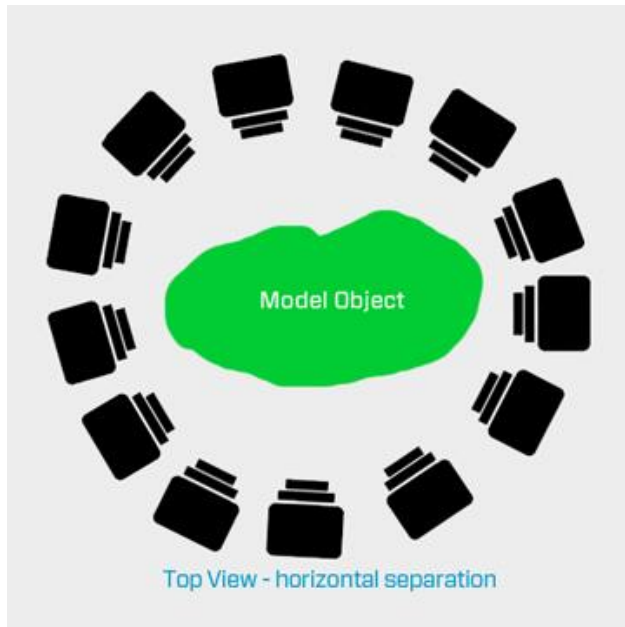
Photogrammetry

Workflow

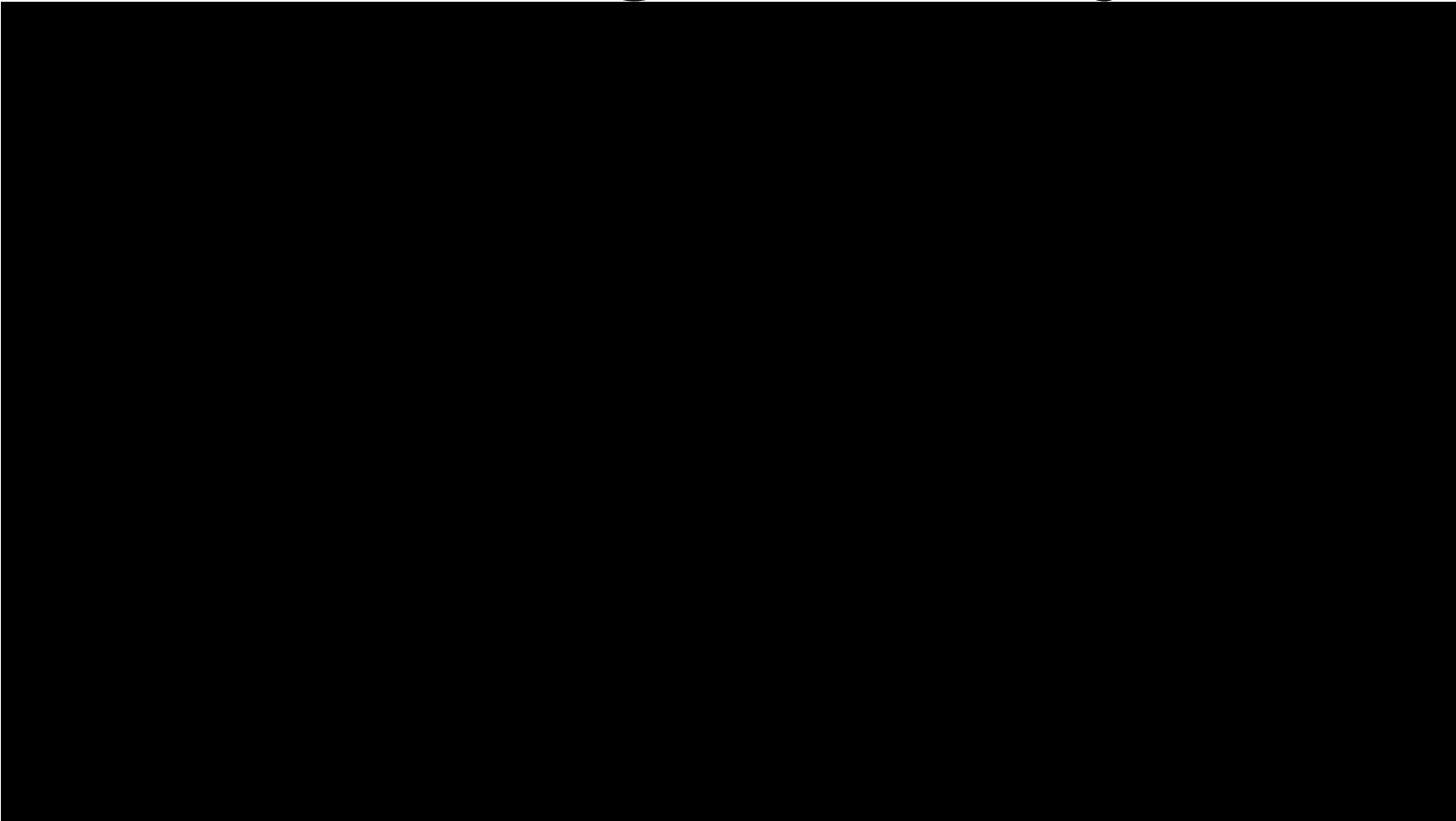
1. Ensure the object or scene has a suitable **pattern or texture** on the surface.(no shiny surfaces)
2. Ensure good and **consistent lighting** during photography.
3. If there are no pattern or textures, use easily-identifiable points around the scene or object
4. Take multiple photographs of the object or scene - these are often taken **at 10 degree intervals** at varying angles
5. Edit photos if necessary– **remove blurry photos**
6. Load the photographs into the photo-based scanning software.
7. Initiate the software's automated scanning/matching step on selected photos
8. The resulting 3D point cloud can be meshed (to **convert to a triangulated surface**), or merged with other point clouds.
9. Export the result, perform measurements, or visualize with projected photo-textures.

Photogrammetry

Typical photogrammetry layout



Photogrammetry



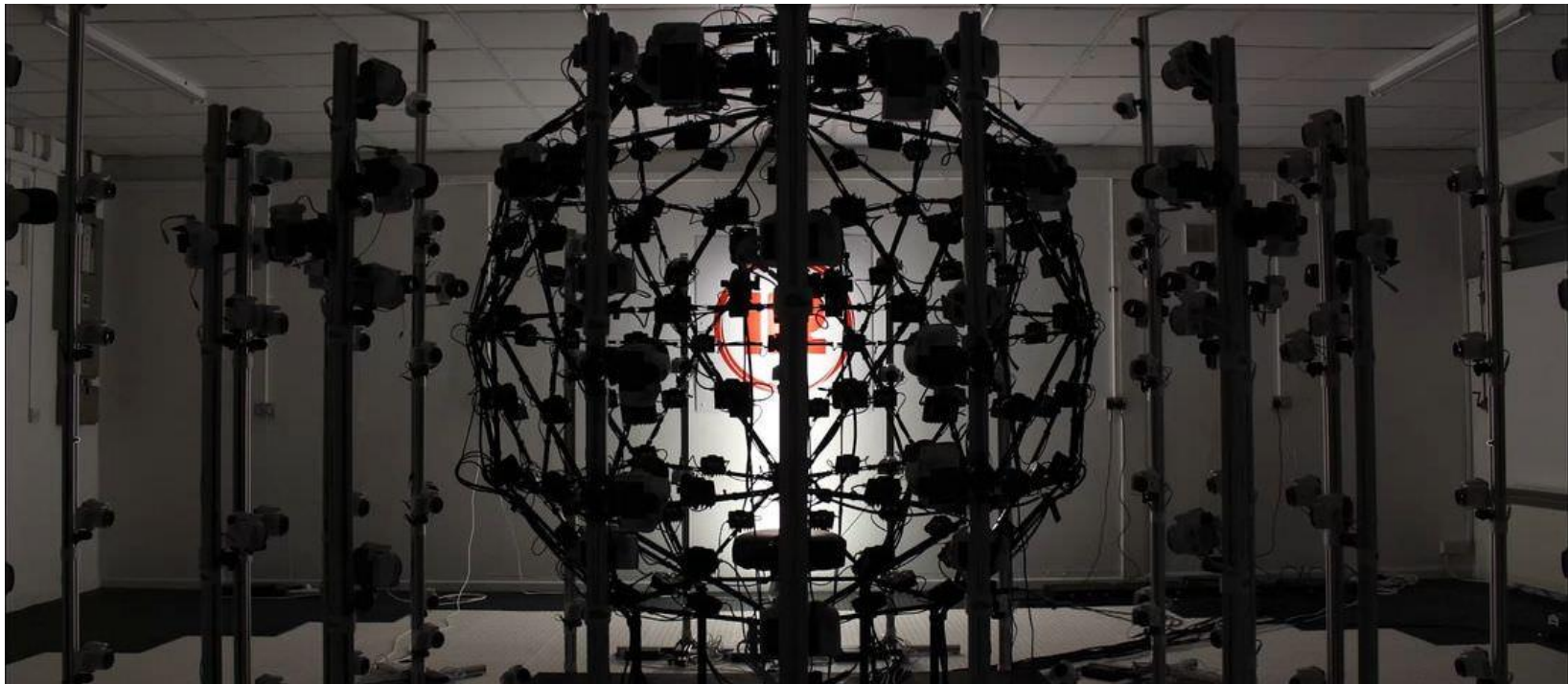
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Photogrammetry

Photogrammetry rig - Single point
capture system for dynamic 3d
scanning





Thank You



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