Mastering Photogrammetry: Turning Photos into 3D Models

Photogrammetry is the art and science of extracting 3D data from 2D images. By capturing multiple overlapping photos of a subject or scene, you can generate accurate 3D models using specialised software. Once reserved for scientists and surveyors, photogrammetry is now accessible to photographers thanks to powerful computing and dedicated apps.

What Photogrammetry Actually Involves

- Capturing many overlapping images from different angles.
- Feeding them into software that reconstructs depth using triangulation.
- Producing a textured 3D model that can be exported or 3D printed.
- Typically done with drones, DSLRs, or mirrorless cameras on tripods.

The Pros of Photogrammetry

- **Detailed 3D models**: Great for architecture, archaeology, and gaming.
- **Accessible tools**: Software like Meshroom, RealityCapture, or Agisoft.
- **No specialist hardware needed**: Just a good camera and patience.
- **Accurate spatial data**: Useful in mapping, design, and creative art.
- **Creative possibilities**: Combine it with animation, VR, or 3D printing.

The Limitations

- **Processing time**: Rendering models can take hours or more.
- **Lighting consistency**: Uneven lighting can disrupt reconstruction.
- **Requires lots of images**: Dozens to hundreds may be needed.
- **Large file sizes**: Outputs can be massive and require good hardware.
- **Learning curve**: Software can be complex at first.

How to Use Photogrammetry Wisely

- **Use manual exposure**: Keep settings consistent across all shots.
- **Shoot with overlap**: Aim for at least 60–80% coverage between photos.
- **Avoid reflective or transparent surfaces**: These confuse the software.
- **Plan your walk-around**: Capture all angles—top, sides, details.
- **Use stable lighting**: Cloudy days work well for outdoor subjects.

Testing & Hands-On Experiment

1. **Choose a small object like a statue or chair.**
2. **Set your camera to manual mode, use a mid-aperture like f/8.**
3. **Photograph it in a circle, every 10–15 degrees—overlap is key.**
4. **Upload images to free software like Meshroom or Polycam.**
5. **Render the model and rotate it in 3D to explore your creation.**
6. **Adjust your technique and try again with a larger object.**

Camera Manufacturer Symbols Table

Manufacturer	Photogrammetry-Friendly Features	Additional Notes
Canon	Manual Mode (M)	Allows locked exposure across many frames.
Sony	Focus Peaking, Manual Mode	Ensures sharp, consistent shots, great for tethered capture.
Nikon	M Mode + Grid Lines	Grid helps align and maintain consistent framing.
Fujifilm	Film Simulation Off, Manual Mode	Keeps colour grading neutral for accurate texture mapping.
Panasonic	Post Focus & Focus Stacking Modes	Can assist in enhancing sharpness across frames when depth is needed.