Defining the workflow

Executive summary

- We used an inward-facing orbit at multiple heights with 70–80% overlap, then added ceiling/floor and corner shots.
- High overlap and convergent geometry delivered stable alignment with fewer non-estimated cameras and fewer holes.
- Uniform walls needed reference markers; reflections and mixed lighting were controlled.
- Camera was run fully manual (f/8–f/11, ISO 100–200, 1/60s+, WB fixed, RAW).
- For a 2×1 m room, ~120–140 photos covered the scene cleanly.

Why the inward-facing orbit worked

- High overlap and multi-angle coverage improved feature matching and reduced n on-estimated cameras.
- Convergent geometry (camera aimed slightly inward)
  increased parallax on walls/corners and improved vertical reconstruction.
- Systematic path at consistent heights and lens settings produced uniform, alignable data.
- Full perimeter passes plus ceiling/floor minimized blind spots and mesh holes.

Marker points (what we used and why)

- Purpose: add distinct, high-contrast features so alignment stays stable on uniform surfaces (white walls, smooth floors).
- Type: simple bold black “X” or dot on A4; optionally coded circles if using software that supports auto-target detection.
- Placement principles:
- Walls: 3–4 per wall, spread horizontally and vertically; eye/mid/near-floor; avoid perfect grids.
- Corners: offset 20–30 cm from edges so they’re visible from multiple angles.
- Floor/near ceiling: a few for 3D reference.

- Glass: avoid sticking to glass; place near it on floor/ceiling or use matte tape if necessary.
- No duplicates: rotate/label to avoid identical targets.

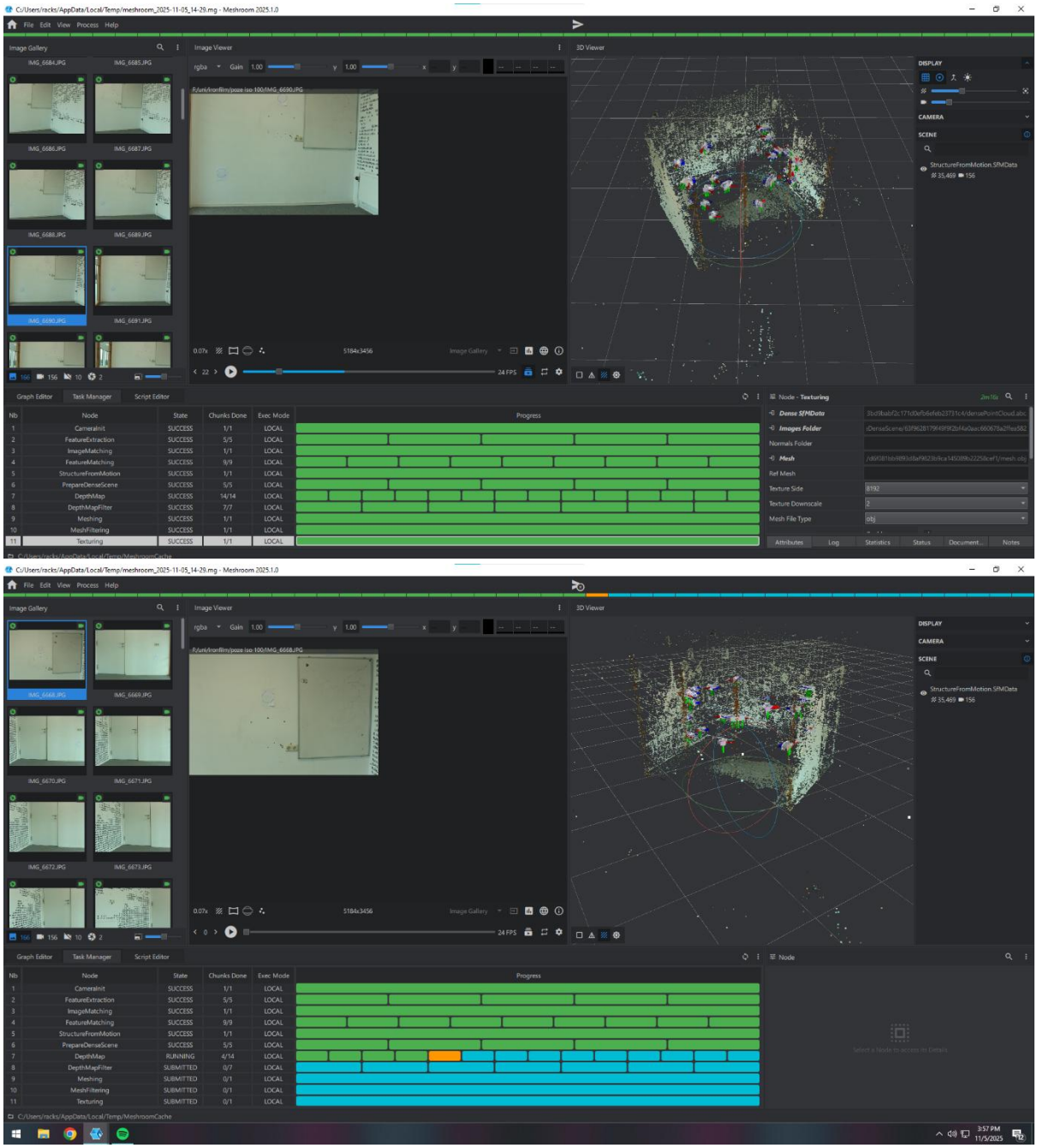
Camera and capture settings (Canon EOS 650D)

- Mode: Manual.
- Aperture: f/8–f/11 for depth of field.
- Shutter: 1/60s or faster (avoid blur).
- ISO: 100–200 (keep noise low).
- White balance: fixed (not Auto).
- Focus: manual (prevent focus shifts).
- Format: RAW (CR2), convert later for processing; JPEG acceptable for quick tests.
- Stabilization: off when on tripod.

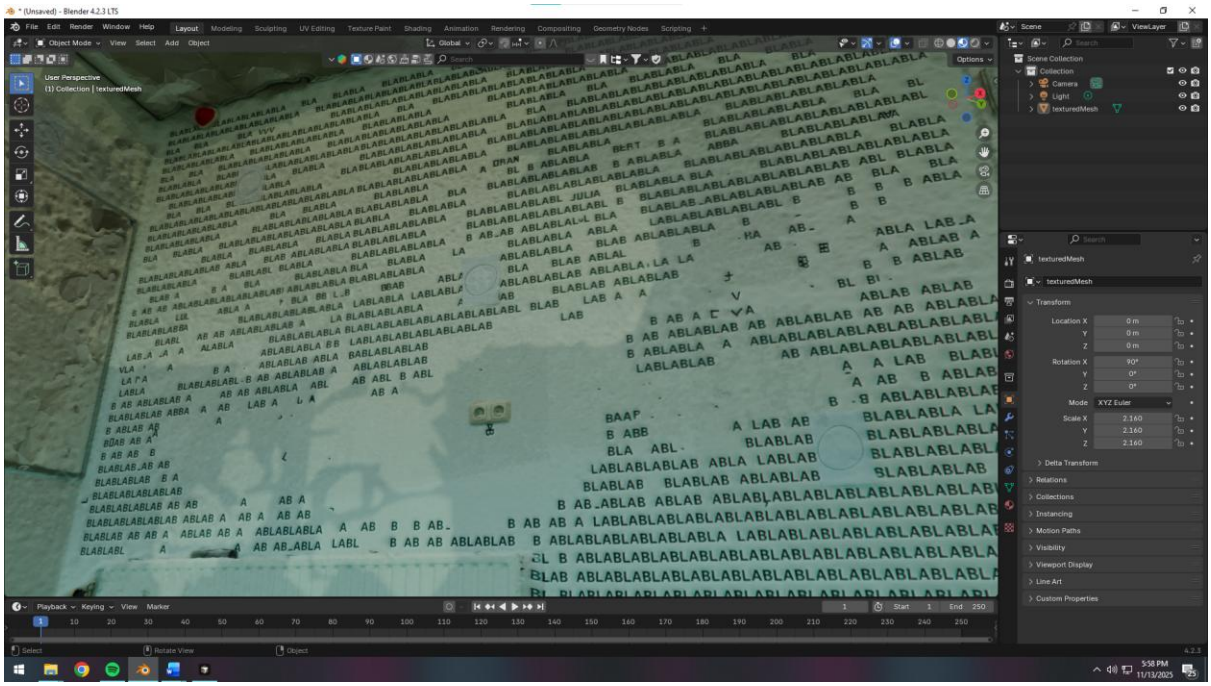
Shooting plan used

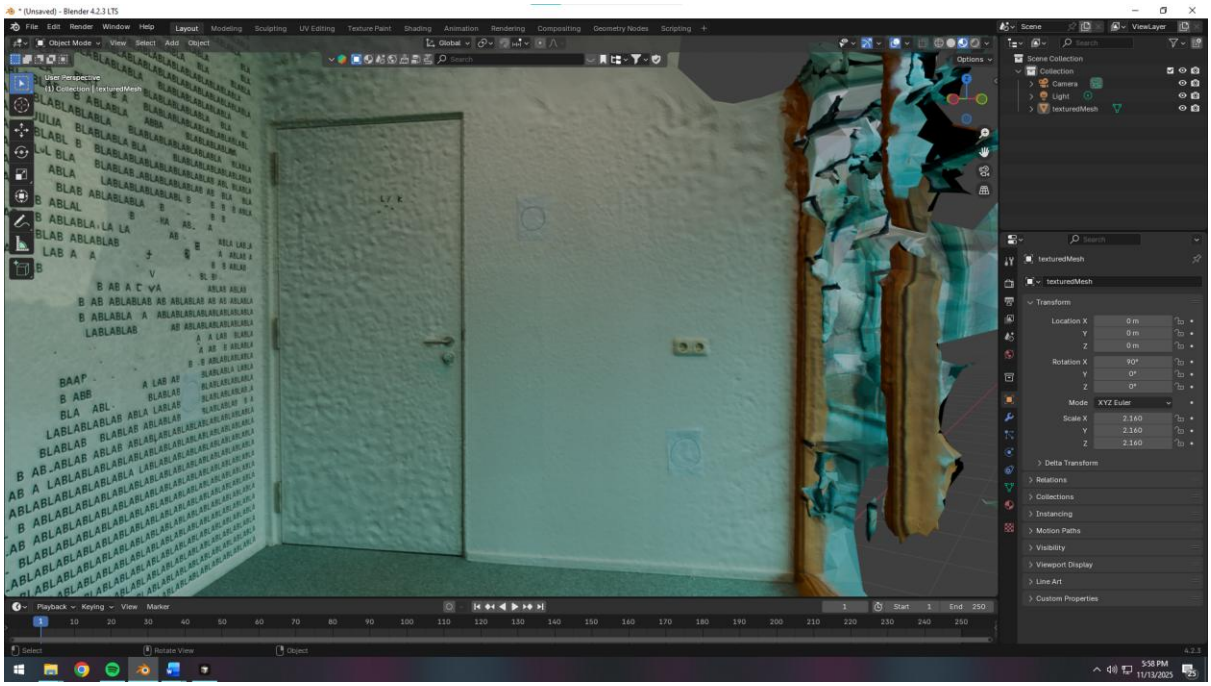
- Three orbits around the room, camera slightly inward:
- Low: ~0.5–0.7 m
- Mid: ~1.3 m
- High: ~1.8 m
- Take a shot every 20–30 cm; maintain ~70–80% overlap.
- Ceiling and floor:
- From centre, 4–6 upward shots toward corners; repeat angled down for floor; include some wall in frame for context.
- Corner reinforcement:
- 2–3 angled shots per corner from ~1 m, with small variations in tilt/distance.

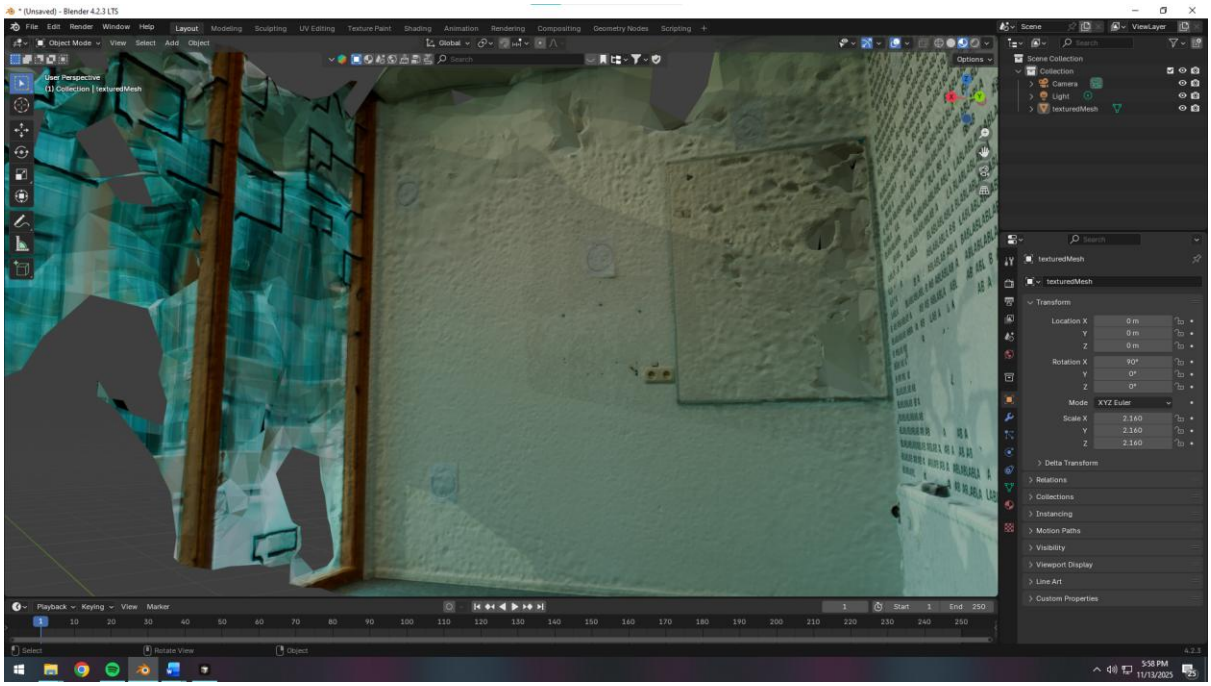
ISO 100


C:/Users/racks/AppData/Local/Temp/meshroom_2025-11-05_14-29.mg - Meshroom 2025.1.0
File Edit View Process Help
Image Gallery
Image Viewer
3D Viewer
Graph Editor
Task Manager
Script Editor
Node
State
Chunks Done
Exec Mode
Progress
CameraInit
FeatureExtraction
ImageMatching
FeatureMatching
StructureFromMotion
PrepareDenseScene
DepthMap
DepthMapFilter
Meshing
MeshFiltering
Texturing
SUCCESS
LOCAL

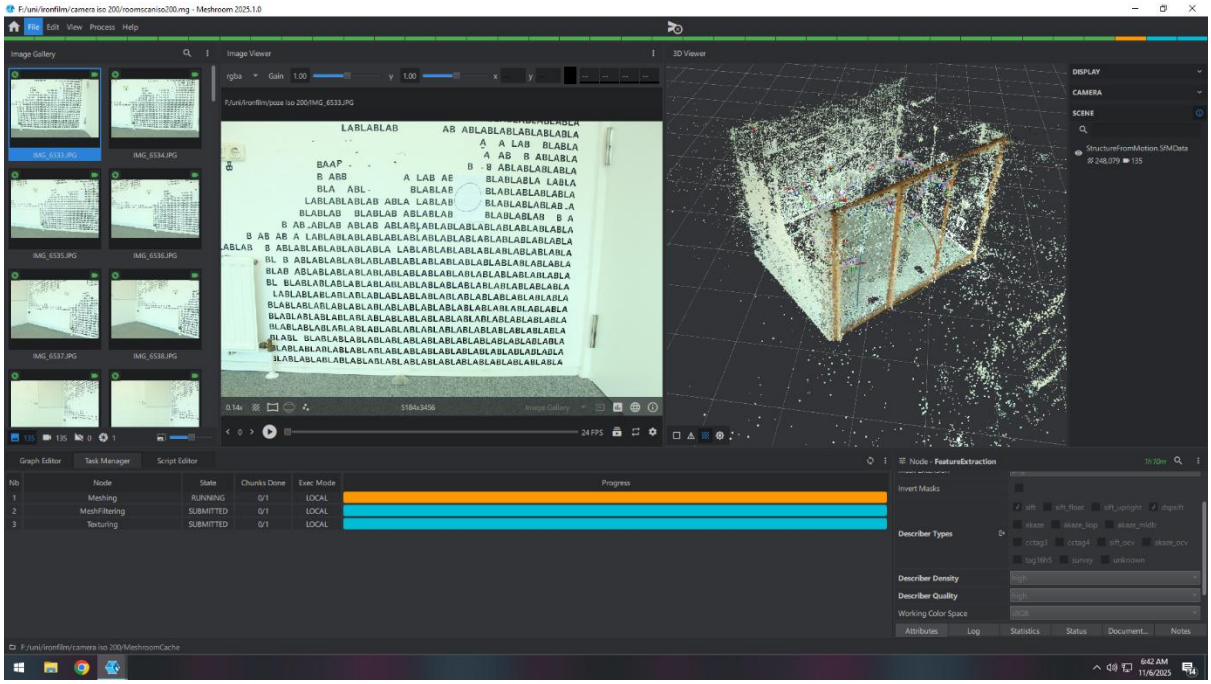
C:/Users/racks/AppData/Local/Temp/meshroom_2025-11-05_14-29.mg - Meshroom 2025.1.0
File Edit View Process Help
Image Gallery
Image Viewer
3D Viewer
Graph Editor
Task Manager
Script Editor
Node
State
Chunks Done
Exec Mode
Progress
CameraInit
FeatureExtraction
ImageMatching
FeatureMatching
StructureFromMotion
PrepareDenseScene
DepthMap
DepthMapFilter
Meshing
MeshFiltering
Texturing
SUCCESS
RUNNING
SUBMITTED
LOCAL

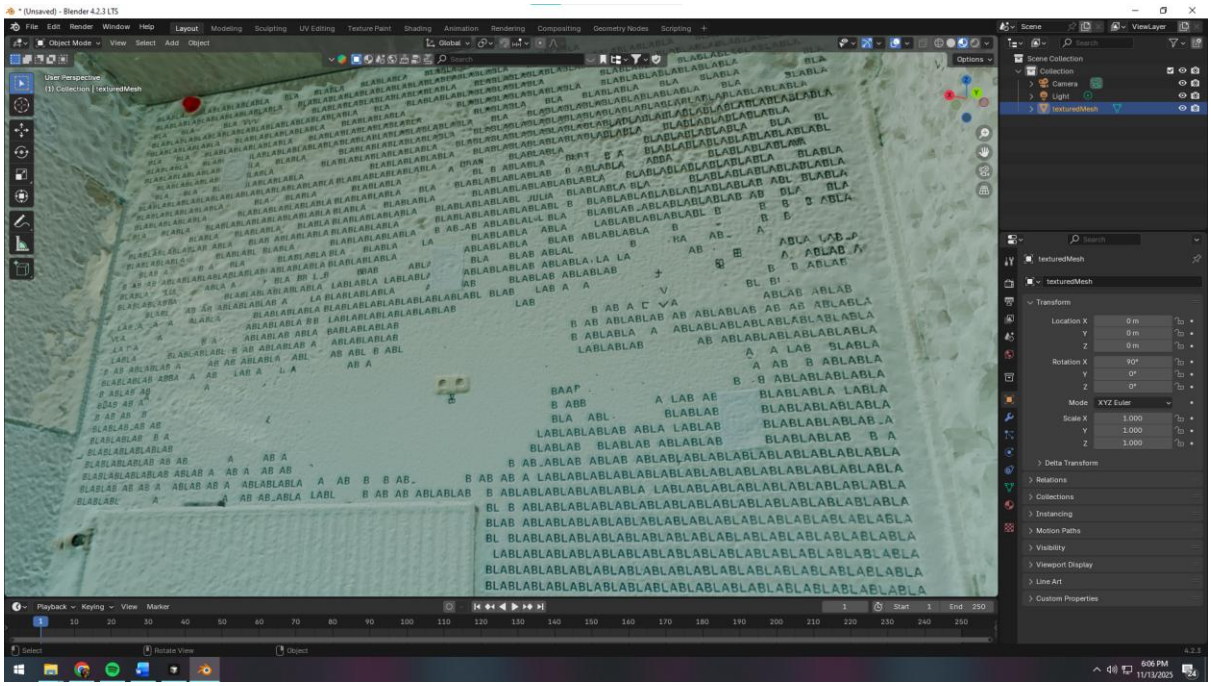


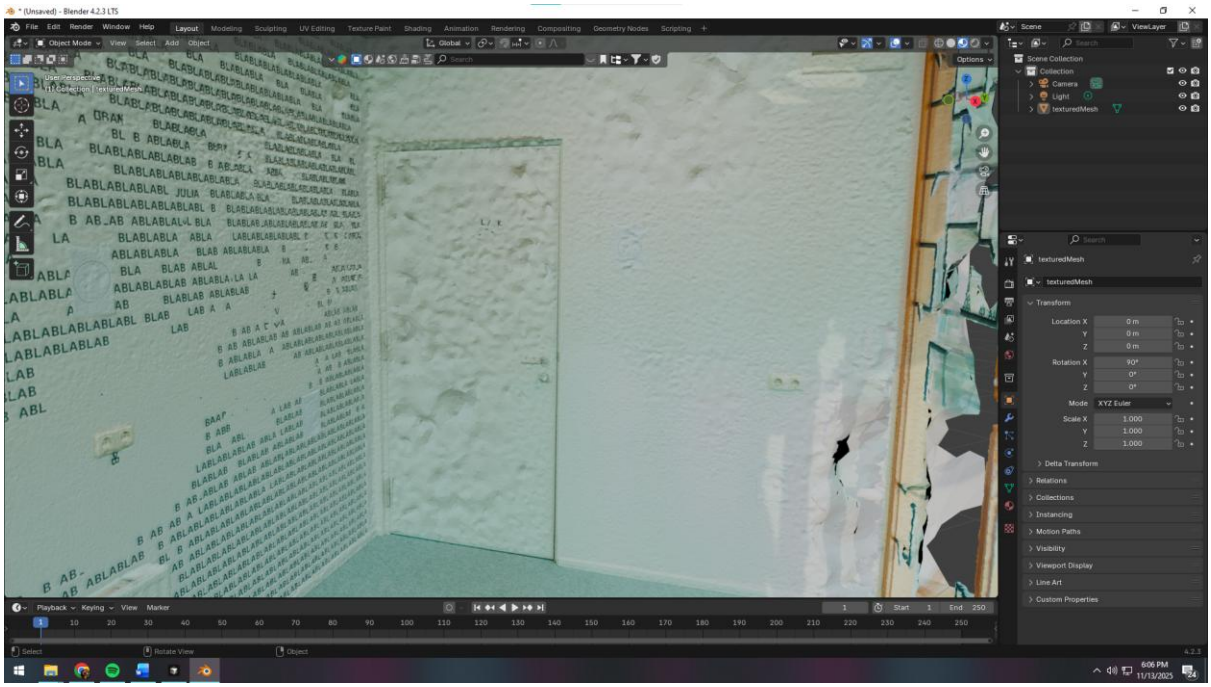




>>>


F:/uni/ironfilm/camera iso 200/roomscaniso200.mg - Meshroom 2025.1.0
File Edit View Process Help
Image Gallery
Image Viewer
3D Viewer
DISPLAY
CAMERA
SCENE
Graph Editor
Task Manager
Script Editor
Nb Node State Chunks Done Exec Mode Progress
1 Meshing RUNNING 0/1 LOCAL
2 MeshFiltering SUBMITTED 0/1 LOCAL
3 Texturing SUBMITTED 0/1 LOCAL
Node - FeatureExtraction
Describer Types
Describer Density
Describer Quality
Working Color Space
Attributes Log Statistics Status Document... Notes
F:/uni/ironfilm/camera iso 200/MeshroomCache
6:42 AM
11/6/2025


* (Unsaved) - Blender 4.2.3 LTS
File Edit Render Window Help
Layout Modeling Sculpting UV Editing Texture Paint Shading Animation Rendering Compositing Geometry Nodes Scripting
Object Mode View Select Add Object
User Perspective
(1) Collection | texturedMesh
Scene Collection
Collection
Camera
Light
texturedMesh
Transform
Location X 0 m
Rotation X 90°
Mode XYZ Euler
Scale X 1.000
Delta Transform
Relations
Collections
Instancing
Motion Paths
Visibility
Viewport Display
Line Art
Custom Properties
Playback Keying View Marker
Start 1 End 250
6:06 PM
11/13/2025



ISO 100 vs ISO 200 — comparison (completed)

Outcome

- **ISO 200 produced slightly brighter, higher-contrast images, which increased SIFT feature detections and improved alignment in darker corners.**
- **ISO 100 was cleaner (lower noise) but too flat in some areas; corners underexposed → fewer matches.**

Processing choices that helped

- **SIFT only: more stable, cleaner matches for a structured interior.**
- **DepthMap Downscale = 1: maximum geometric detail (longer runtime, acceptable for finals).**
- **Max Neighbour Cameras = 14: smoother, more continuous surfaces indoors.**
- **Texture 8K (8192): crisp textures given high-res inputs.**

What worked well

- **Consistent lighting and exposure across the set.**
- **High overlap with systematic paths.**
- **Printed A4 markers materially improved correspondences on uniform walls.**

Further gains (next runs)

- **Add lamps/reflectors to lift corners and reduce shadow variance.**
- **If ceiling/floor are sparse, add a dedicated pass to reach ~140–200 photos.**
- **Mitigate reflections (cover glass, block window views).**
- **Validate poses in Meshroom (show cameras; delete obvious misalignments) before meshing.**
- **In Blender: Decimate if heavy; smooth shading and normal-map bake for presentation.**