

Scan Delta

Align two 3D point clouds and inspect geometric changes.

Simulated geometry · Recorded 2026-10-09 · CPU execution

The screenshot shows the Scan Delta web application interface. The top navigation bar includes the Quarkeon Labs logo, a 'Company portfolio' link, and a 'LOCAL DEMONSTRATION' button. The main header area displays 'APPLIED ENGINEERING / EVIDENCE YOU CAN INSPECT' and the title 'Scan Delta'. Below the title, a subtitle reads 'Register two 3D scans and inspect added, removed and unchanged geometry.' A progress bar shows four steps: 01 / INPUT (active), 02 / PROCESS, 03 / EVIDENCE, and 04 / REVIEW & EXPORT. The '01 / INPUT' section is titled 'Choose an input' and includes a 'Demonstration case' dropdown menu set to 'Machinery assembly · 18° capture offset'. Below this is a placeholder for '3D geometry / paired inputs'. A 'Change distance (fixture metres)' input field is set to '0.055'. A red 'Run analysis' button is present. Below the button, it says 'Inputs stay on this machine.' and lists two options: 'Use your own files' and 'Evaluation & limitations'. The '02 / PROCESS' section is titled 'Inspect the evidence' and shows 'Analysis complete. Inspect the evidence and record a review.' It displays three metrics: 'Aligned overlap' at 94.2%, 'Added candidates' at 1135, and 'Removed candidates' at 1035. A 3D viewer shows two point clouds (one grey, one red) on a grid. A 'Reset view' button is in the top right of the viewer. Below the viewer, instructions read: 'Drag to orbit · Scroll to zoom · Red frusta: cameras · Home: reset'. A legend explains: 'Red: inspection points beyond the reference tolerance. Amber: reference points absent from the inspection. Grey: matched geometry.' and 'Distances measure proximity, not certified dimensional accuracy. Occlusion, density and capture coverage can appear as changes. ICP assumes rigid geometry and useful overlap.' At the bottom, there are four download buttons: 'result.json', 'aligned.ply', 'removed.ply', and 'distances.csv'.

The problem

Two scans need a common reference before differences in shape or coverage can be interpreted.

What the demo does

PCA initialization and trimmed ICP estimate the rigid motion. Bidirectional distances flag added or absent geometry, with a 3D viewer and PLY/CSV exports.

Recorded evidence

Check	Recorded result
Transforms recovered within the stated check	3 of 3

Data and method

Procedural machinery assembly. Three known capture transforms, independent millimetre-scale noise, one added object and one removed object. Fixture units are metres.

Limits that matter

Controlled geometry, not real LiDAR or certified metrology. Proximity cannot distinguish a true removal from occlusion or missing capture coverage. Rigid registration requires useful overlap; symmetric or repetitive geometry can remain ambiguous.

What we could build with you

A pilot for scan processing, alignment, geometric analysis and reviewed change detection.

What we would agree first

Units, sensor precision, common coverage, density, tolerances and independent acceptance measurements.

Evidence and contact

Video, complete evaluation and bilingual case: <https://quarkeon-website.pages.dev/en/projects/scan-delta/>

Discuss a scoped pilot: <https://www.upwork.com/agencies/2108116767018789544>

Independent demonstration, not customer work. Metrics apply only to the described inputs and checks. Photos, data and model provenance are recorded in the private application repository; public data retains its original license.