

The Match 3D Tool

SAL3D Tools

The **AQSENSE SAL3D Match3D Tool** is a sophisticated piece of software that allows the extremely fast alignment and comparison of 3D point clouds with their respective models. Based on a "best-fit" approach, the patent-pending alignment procedure can be used as a tool for quickly determine the position and orientation of objects, or combined with the SALD3D Core for an optimized surface subtraction for comparison purposes.

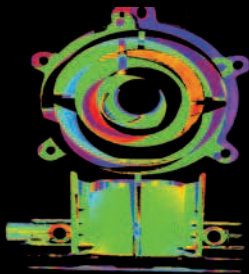
Features:

- Alignment time ~ 100ms*
- Alignment error < 1 micron*

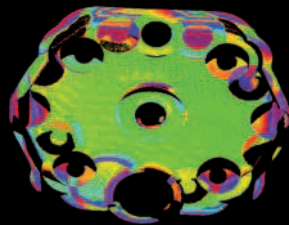
***Our Benchmark:** 1 Million point surfaces. Initial misalignment of 10 degrees and 10 mm in the three axis XYZ. CPU Intel Pentium IV Core Duo 2 1.8GHz 2 GiB DDR2 (667MHz) RAM. Comparison time according to ROI size

Benefits

- 100% Parts Dimensional inspection and analysis
- Complex Shape 3D surface inspection
- Avoid mechanical complexity for parts positioning
- No machine re-engineering due to model change

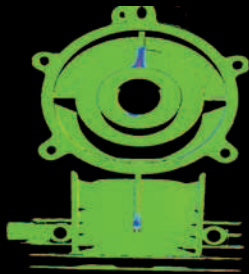


Disparity Maps
before alignment

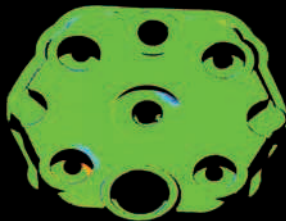


Alignment is necessary
BEFORE comparison is done

Comparison of misaligned
surfaces yield wrong results



Disparity Maps
after alignment



Comparison of alignment surfaces
highlights defects only

The disparity map data are height differences between the model and the scanned point clouds. After calibration, the differences are directly in metric units. The combination with the calibration tool is recommended for significant perspective distortion cases. The disparity map can be coupled with quality control criteria at production line speed.

Match3D + Comparison Sample Code

```
sal3d:RangeMap model (modelFileName);
sal3d:Match3D matching (model);

while (!endProcess ())
{
    sal3d:RangeMap part (getRangeMap ());
    sal3d:Match3D alignmentMatrix (matching (part));
    sal3d:RangeMap disparityMap (sal3d:subtract (model, part,
    alignmentMatrix));
    // Enqueue the disparity map so another thread can process it.
    enqueueDisparityMap (disparityMap);
}
```

Please, refer to the SAL3D product sheet for O.S. and compiler compatibility