# mvIMPACT Blob

Blob analysis is a well-known technique to isolate objects and features of an arbitrary kind, analyze their shape or position, and classify them. It combines image binarization and connected component analysis for segmentation.

The innumerable applications of this powerful method relate to item counting, presence/absence check, placement control, part identification, flaw detection, defect characterization, morphometry…
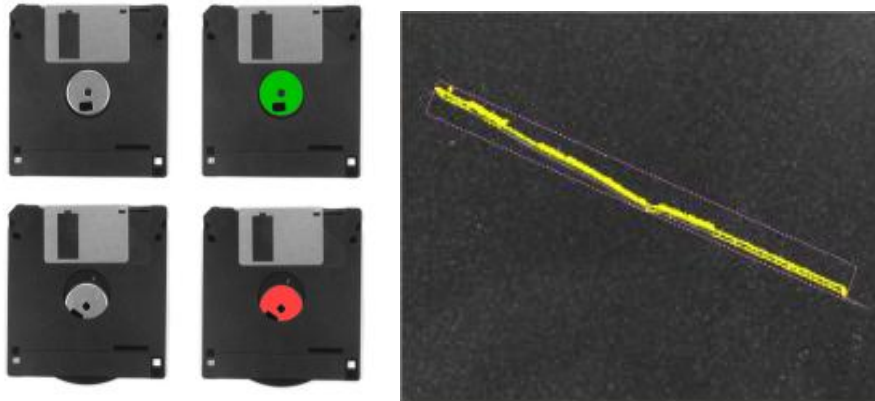
Part placement verification and detection of scratches
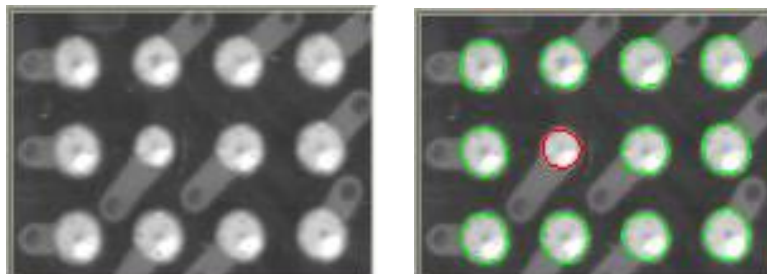
Solder ball diameter and roundness check

Major features

Preprocessing

To allow full control on the segmentation process, binarization is kept as an external preprocessing step. This allows to pre-filter by any means such as morphology in the gray-level or binary domains, using the base module or custom functions.

Analysis

An extended range of geometric characteristics can be computed, dealing with:

- **pose**: center of gravity and centroid, Feret and inertia angles
- **size**: bounding box, ellipse of inertia, Feret diameters, fiber width and length
- **extent**: surface, convex surface, polar distance, perimeter, convex perimeter
- **inside**: Euler number, total and average hole surface, perforation
- **shape**: central moments, roundness, roughness

- **density**: autocorrelation, contrast, cooccurrence matrix, energy, entropy, histogram, histogram statistics, optical density...

Selection

When objects have been characterized, further processing can be focused on the relevant ones by checking if the measured values belong to given acceptance ranges. This way, clutter, noise and irrelevant items can be discarded.

This selection process can be cascaded to narrow down the search of objects of interest.

Calibrated coordinates

In addition to standard pixel-based parameter computation, calibrated coordinates can be used. This means that reference axis can be placed anywhere in the image, scale factors and rotation angle specified, to yield real-world measurements.