

CVTCLIB

The **CVTclib** software library, developed by CUVIS for Opto Engineering, is a powerful tool for building custom software applications in telecentric-based metrology systems.

KEY FEATURES:

- calibration of telecentric measurement systems
- correction of residual lens distortion
- fast subpixel edge detection and labelling.

Calibration and Correction of distortion

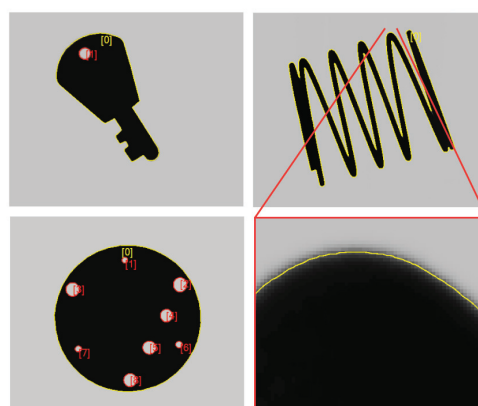
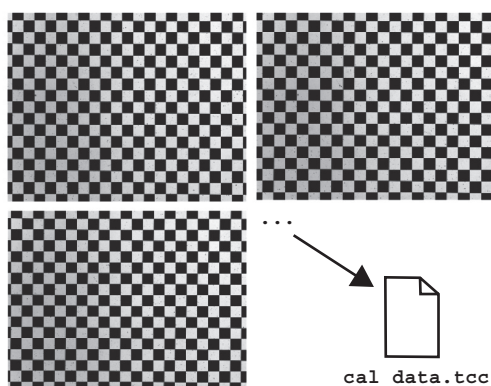
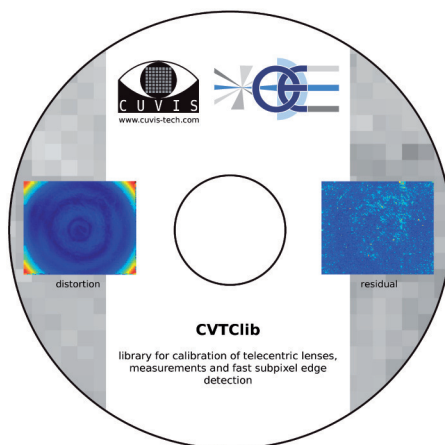
Even if the distortion of Telecentric Lenses is usually very low, it can still lead to unwanted measurement errors: CVTclib allows for extremely accurate calibration of the system by minimizing residual distortion, thus making the most demanding applications possible.

Just to give a feeling of the software capabilities, let's consider a telecentric lens featuring a distortion as low as 0.1%; this would normally lead to a 0.1 mm dimensional error at the image borders when imaging a 100 mm wide object, while CVTclib can lower such error to 0.007 mm (0.007%).

The calibration procedure just requires the acquisition of a few pictures of a checkerboard pattern; CVTclib's calibration functions take into account lens distortion (radial and trapezoidal), optical system misalignment and background illumination inhomogeneity.

System calibration data are stored into a small binary file which can be used during the measurement process.

Software library for telecentric lens metrology



CVTclib provides three ways to correct measures, so as to comply with the different stages of a measurement procedure (image processing, edge detection and edge analysis):

- **Single point coordinates correction**, to be used in combination with existing image processing and edge detection functions; CVTclib can elaborate the edge so as to obtain its undistorted metric coordinates.
- **Subpixel edge detection** together with undistorted metric coordinates computation, by means of CVTclib functions straight on camera frames.
- **Entire image correction**; you can pass a camera frame to CVTclib and get it undistorted, so that you can use your own image processing and edge detection functions.

Edge Detection

CVTclib implements superior edge detection functions with subpixel accuracy that can:

- extract edges with different precision grades
- return them as ordered chains of pixels for ease of computation
- label edges as "internal" or "external"
- identify them through an ID, also allowing for multiple objects analysis

Product Package

The software package includes:

- runtime library files: CVTclib.dll, CVTclib.lib, header files
- sample applications for calibration and measurement, to quickly test the library
- reference manual, with full documentation of the library functions and code examples.