



VISION 3D

High rate 2D and 3D images acquisition for 3D measurements.

Project Summary

The industrial control of parts of watches and semiconductors components ask for accuracy in the range of 10 microns in all three dimensions for a field of view of few cm and acquisition rate of few images by second.

The interferometry with low coherence is an optical technique which allows obtaining unidimensionnal profiles of samples with a resolution in the order of the micrometer. With the aim of increasing the speed of images acquisition, Heliotis developed a CMOS sensor where every pixel contains integrated features which allow acquiring an in-depth profile of the sample. Unfortunately the spatial resolution of the sensor is limited to 144 x 90 pixels, which is insufficient for 2D dimensional measurements.

In this project, we developed a system which is based on the sensor CMOS Heliotis sensor combined with a high-resolution conventional 2D camera, with the aim of increasing the field of view and the spatial resolution while keeping the micrometric resolution in depth, and so to obtain a new successful instrument at a lower cost.

The system acquires separately the 2D and 3D images and thanks to a calibration procedure combines them and extract correlated information.

We obtain an accuracy in the order of 10 microns in three dimensions for a field of view of 30mm and a measurement depth of 2 mm. The acquisition time is lower than the second.

Valorisation

The developed system allows to measure parts with high-speed and high-resolution 3D.

Its mechanical conception and its performances allow it to be directly integrated into a production line without slowing down the rate. The software allows configuring it easilys.

The system is adapted for example to the dimensional measurement of watches' parts.

Contact / Aldo Salvi (aldo.salvi@he-arc.ch)
Authors / Aldo Salvi

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