

Fraunhofer Business Unit Vision

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Fraunhofer Business Unit Vision as an external source of R & D

The Fraunhofer's Business Unit Vision pools the expertise of the Fraunhofer Institutes in the fields of machine vision, image processing and optical testing and measurement techniques.

Make use of our know-how to obtain the optimum solution for your particular needs.

FRAUNHOFER VISION

SOLUTIONS THROUGH MACHINE VISION

The application of modern image processing systems helps to achieve substantial improvements in the quality of products and processes and thus increases the users' competitiveness. Image processing systems can be used in nearly all industrial fields. The possibilities range from ultra mobile technologies for on-site investigations to inline systems for 100 percent testing within the industrial production cycle. The effective implementation of vision systems depends on the particular application and is a task for experts.

Applied research in the fields of image processing and optical testing and measurement technology has been conducted for many years within Fraunhofer. A wealth of research results in these fields of image processing has already reached the point of practical implementation and is available to users.

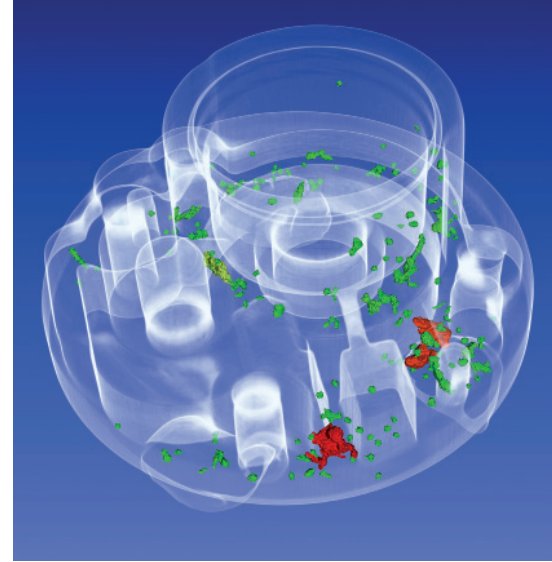
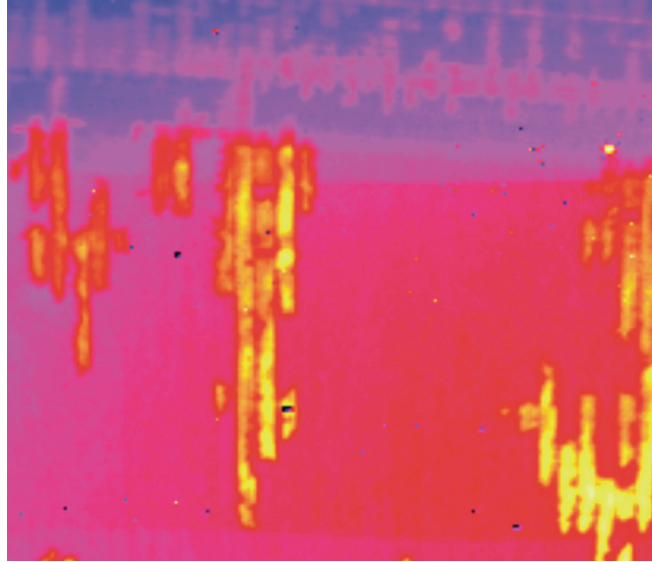
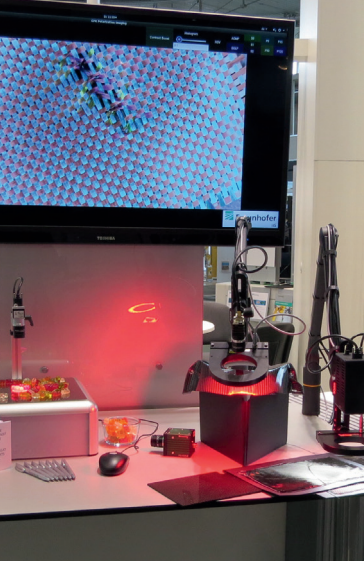
In order to pool their expertise and provide customers with optimum service, several Fraunhofer Institutes have joined forces to form the Fraunhofer Business Unit Vision. The Central Office of the Fraunhofer Business Unit Vision in Fürth acts as a contact point to answer all questions relating to image processing.

The Central Office of Fraunhofer's Business Unit Vision offers:

- Competent advice on all questions relating to image processing
- Discussion of your individual application, ideally with analysis of samples
- Consultation regarding solution options
- Feasibility studies in order to estimate costs
- Identification of an ideal project partner for technical support and regional service
- Formation and coordination of an appropriate project team to deal with complex interdisciplinary tasks

Cooperation Benefits

- Technological advice
- Preliminary and feasibility studies
- Support with the introduction and testing of new technologies
- Development of complete turn-key systems
- Modification and optimization
- Measurement and testing services
- Training and further education, additional services
- Funded and cooperative projects



Technologies and Fields of Application

The developments carried out by the Fraunhofer's Business Unit Vision Institutes are mainly used in the fields of quality assurance and industrial production.

Inspection of Surfaces

- Textures and colors (metal, paper, cloth, wood, fleece, sponges etc.)
- Geometrical imperfections and 3D defects (scratches, grooves, fissures)
- Bulk material and powder
- Transparent materials and glass
- Shiny and reflective materials
- Color sensing and measuring
- Bore holes and threads

Characterization of Surfaces

- Visualization of microstructures
- Surface topography and roughness
- Microcoordinate metrology
- Detection of contamination

Optical 3D Measurement Technology

- Inline or offline measurement of the geometry of sample parts
- Self-calibrating 3D measurement systems
- Digitalization and reconstruction of 3D pieces
- Hand-guided mobile 3D sensor systems
- Combined 2D and 3D measurement
- Workpiece identification and object recognition
- Optical 3D sensors in coordinate measuring machines
- Extensively measuring 3D camera systems (Time-of-Flight)

X-Ray Technology

- Detection of cavities, pores, fissures, etc. within materials
- Computer tomography for 3D measurement of inner structures
- Computer laminography for analysis of flat components
- Analysis of microstructures
- From portable to inline systems

Heat-Flux Thermography

- Detection of near surface defects, such as fissures, splicing and adhesion defects, corrosion, etc.
- Determination of layer thickness
- Tightness testing
- Analysis of welding seams or welding points and joints
- Detection of foreign bodies e.g. in food

Additional Technologies for Measurement and Testing Within Materials

- Terahertz measurement technology and tomography, millimetre and microwaves
- Optical coherence tomography
- Shearography
- Ultrasound testing and tomography
- Eddy current
- Spectroscopic methods

Other Sectors

- Camera technology and detector development: optical, x-ray, infrared
- Multi-sensor measuring and sensor fusion
- Assembly and worker assistance
- Etc.

Training and Further Education

To spread knowledge about new quality inspection methods, the Fraunhofer Business Unit Vision also offers training and further education and imparts insights within the framework of publications.

Technology Days

- Comprehensive insights into the field of image processing and contactless measuring technology
- Overview of current and up and coming technologies
- Short lectures and exhibition
- Meeting point for industry and applied science

Workshops with Hands-on Training

- Detailed treatment of one special technology
- Conveyance of basic theoretical principles
- Introduction of example solutions
- Inspection of your own sample parts in the practical part
- Contribution to the decision-making process concerning the applicability of the respective new technology to different areas of practice

The Guideline Series

- Published annually
- Simple, easily understandable, yet extensive description of state-of-the-art technologies in the field of image processing
- Extension of the number of users for industrial image processing