

Fraunhofer Institute for Applied  
Optics and Precision Engineering IOF



# 3D robot vision of transparent objects

Position and orientation detection of transparent objects  
for robotic handling

## 3D robot vision of transparent objects

### Position and orientation detection of transparent objects for robotic handling

*goROBOT3D in an exemplary bin picking scene with objects that are difficult to recognize.*

Interacting with transparent, reflective, or pitch-black objects is a major challenge for machines. The goROBOT3D system's new sensor technology enables robots to detect and handle objects with uncooperative surfaces that are immeasurable by conventional 3D sensors. A special laser-based system is used to project a non-destructive thermal infrared pattern onto all objects within the measurement volume. The re-emitted heat distribution is then used to reconstruct the objects' surface shape. goROBOT3D is a highly adaptable system that can be utilized for various robot applications.

#### Applications

- Machine vision for industrial robots, e.g., bin picking, item picking
- Automatic detection of position and orientation of uncooperative objects
- Data processing with established 3D analysis tools

#### System parameters

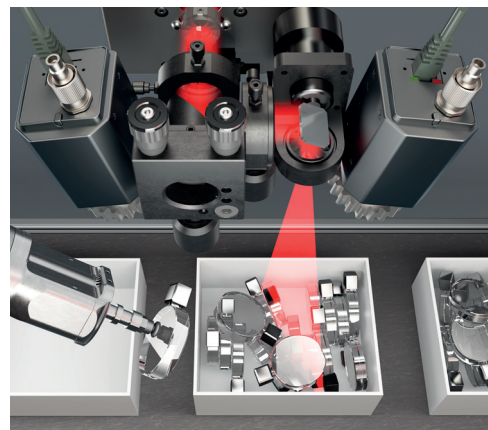
- Recording time: 3 s
- Measurement field: 250 × 200 mm<sup>2</sup> (customizable)

#### Our offer

- Realization of custom-specific 3D measurement systems for uncooperative objects
- Execution of 3D measurement tasks

#### Measurement principle

- Triangulation-based 3D measurement system with active thermal irradiation
- Projection of single thermal fringe in the long-wave infrared
- Synchronous image acquisition by two thermal cameras



*Measuring principle.*

**goROBOT3D**

#### Contact

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