IPMS

MACHINE PERCEPTION –
# ROBOTS LEARN TO SEE

Our Service

Fraunhofer IPMS services range from product conception and development to pilot series production – from the component to the complete system solution.

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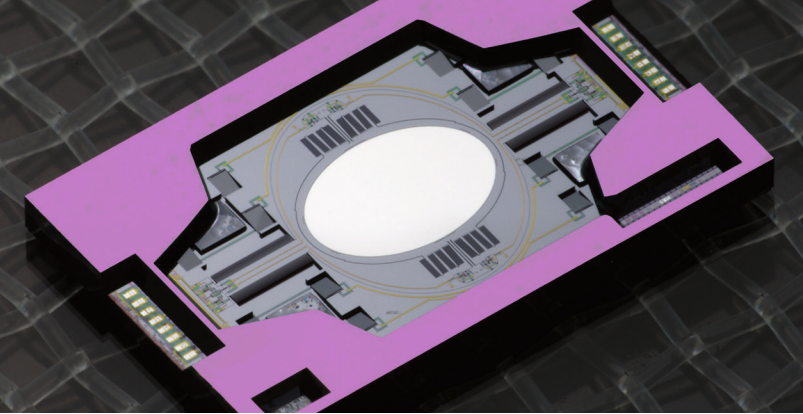
Fraunhofer IPMS pursues the approach of a "scanning eye" to support three-dimensional machine vision. For years, the research institute has been developing and manufacturing so-called MEMS scanner mirrors, used for the targeted deflection of light in applications helpful in industry, the medical field and everyday life. These compact micro-mechanical optical components with an integrated drive are extremely robust and reliable.

MACHINE 3D VISION – LIDAR

MEMS mirrors can be installed at the end of a robotic arm, so that the robot is always "aware" of what is happening in its environment, what steps it has to take and the quality of its work. The scanner mirror module acts as a sort of rastering eye for the robot, which can record high-resolution images in the three spatial axes. The mirror disperses and detects light from a laser in two dimensions, and simultaneously captures depth as a third dimension by measuring the transit time of light between the object and the detector, also known as "LiDAR" (Light Detection and Ranging). Production equipment or vehicles equipped with the Fraunhofer IPMS scanning technology can gain the reliable understanding of their environment needed in order to interact with objects in it.

ENHANCED MACHINE PERCEPTION – 4D

Machine perception can further be enhanced by introducing a broadband light source to detect solid, liquid or gaseous substances by spectral information. In addition to the "time-of-flight"-measurement an optical scanning grating allows for the spectral analysis of various substances by controlling the refection depending on the wavelength.

This system approach can be applied to monitoring pollutants in drinking water and controlling quality in the field of pharmacy, as well as in the remote monitoring of industrial plants to find leakage in pipelines or detect risk of explosion. As a result, Fraunhofer IPMS developments facilitate a new way of acquiring environmental data to make plants safer and protect personnel from contact with hazardous substances.

BENEFITS OF THE "SCANNING EYE"

- Contact-free environmental analysis
- Ultra-high resolution
- Extremely compact
- Suitable for mobile devices
- Robust, reliable and maintenance-free