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Photonics West: Fraunhofer IOF presents high-resolution near-infrared 3D scanner

As in previous years, the Fraunhofer Institute for Applied Optics and Precision Engineering IOF is presented at the world's largest international fair focusing on photonics: Photonics West in San Francisco. From 28 January to 02 February 2017 new developments and innovations from the areas of bonding- and fiber technologies and diffractive optics are being presented. This year's special highlight is a real-time high-resolution near-infrared 3D scanner with synchronous image acquisition which was developed for applications in security technology and human-machine interaction.

Fiber laser systems for excellent beam quality and slope efficiency

It is well known that lasers are important information and energy carriers with a wide range of applications in industry and science. For high power applications in particular, fiber lasers have many advantages in comparison to other laser concepts, for example with regard to highest output power levels with excellent beam quality. High performance laser fibers, in which laser light can be guided and amplified, are the heart of fiber lasers. Therefore an Ytterbium-doped fiber laser amplifier was created at Fraunhofer IOF which builds the basis for a successful development of monolithic fiber lasers.

GRISM - Novel bonding technology for space applications

One new technology concerning "hydrophilic bonding" is also presented. The GRISM – a component composed of a prism and a grating – is based on a compound of optical elements via oxygen bridges. This way a new quality level can be reached. Due to its stability, it is predestined for space applications. This technique can be used for spectrometers. These can analyze precisely the light reflected from the earth by dissecting it into its component colors and are thus able to measure the amount of greenhouse gases in the atmosphere.

3D computer generated hologram (CGH) for display applications

Fraunhofer IOF demonstrates a full color Computer Generated Hologram (CGH) which shows a virtual 3D scene of a planet. The optical concept is based on non-absorptive diffractive microstructures which tailor the angular spectrum of the illumination light with high efficiency. In combination with an RGB-Laser source, this enables full-color true

Editorial Notes

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3D image generation with high brightness, high resolution and low power consumption. In future this optical concept could be suitable for holographic TV.

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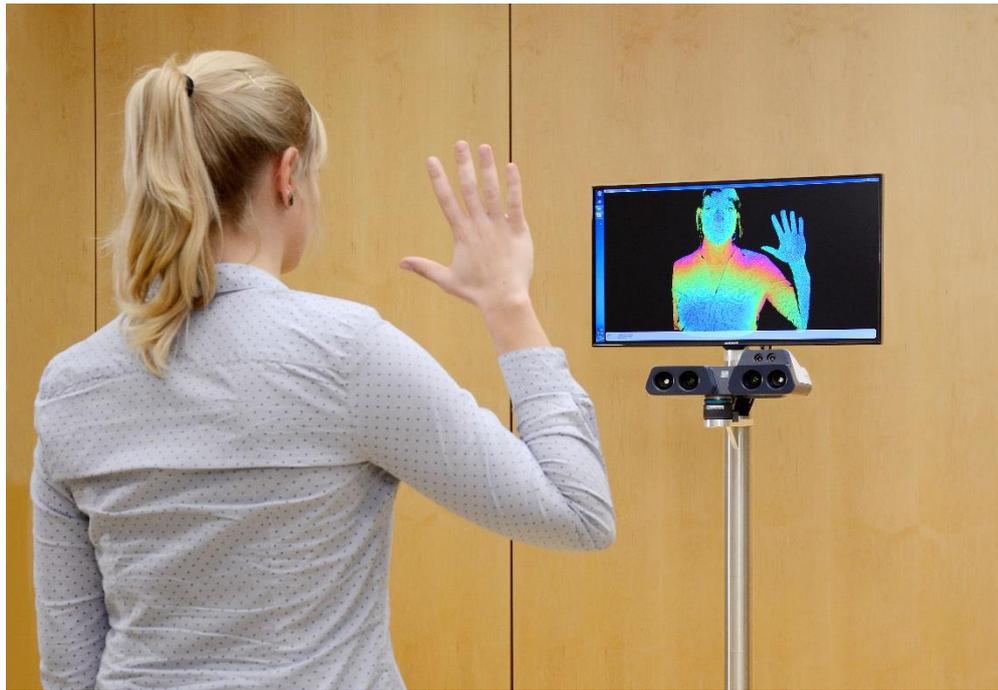
Real-Time High-Resolution NIR 3D Scanner

This year's exponat highlight of Fraunhofer IOF is a 3D scanner based on near-infrared (NIR) pattern projection. It is used to three-dimensionally measure people's poses, gestures, or facial expressions with high accuracy and high resolution. Its core is a specially developed projector allowing a sequence of patterns to be projected at high speed in the NIR spectral range. Thus, disturbing glare effects are avoided for the moving persons to be measured. The 3D point clouds are obtained and displayed as real-time 3D video.

This and much more will await you at the Fraunhofer booth at the Photonics West 2017, German Pavilion, North Hall in San Francisco, USA.



Directly bonded fused silica GRISM (Prism + Grating) with grating at the inner surface.
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Detection of people's poses based on a 3D measurement system. © Fraunhofer IOF