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PHOTONICS spectra

IMAGING NEWSLETTER

The latest news, features, and product developments in imaging components and systems – brought to you by Photonics Media. Manage your Photonics Media membership at Photonics.com/subscribe.

IR Imager Merges AI, Thermal Physics to See in the Dark

Heat-Assisted Detection and Ranging (HADAR), a patent-pending thermal imaging technology from Purdue University, combines infrared (IR) imaging, machine learning, and thermal physics to visualize target objects in the dark as if it were broad daylight. According to its developers, the technology could have an impact on par with lidar, sonar, and radar, by enabling fully passive, physics-aware machine perception.

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Complex Frequency Waves Counter Optical Losses in Superimaging

Superlenses made of plasmonic materials and metamaterials can image features at the subdiffraction scale. However, intrinsic losses restrict the image resolution of superlenses, hindering their widespread use. To compensate for optical loss in superimaging systems, researchers at the University of Hong Kong (HKU) devised a way to provide virtual gain. To do so, they synthesized excitation waves of complex frequency, based on measurements at real frequencies.

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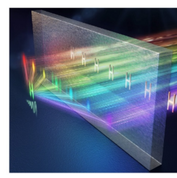

Tomography Technique Images Thick Bio Samples at High Resolution

The ability to image complex biological tissues is essential for many biological studies and clinical diagnostic applications. However, capturing detailed 3D images of thick biological samples is difficult, due to multiple light-scattering in the samples.

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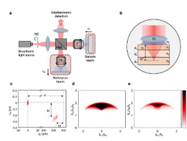

.: Featured Products & Services

Line Scan for Space Limited Systems

Teledyne DALSA, Machine Vision OEM Components

AxCIS™ Contact Image Sensors (CIS) offer a high-speed, high-resolution line scan solution for space limited systems. AxCIS combine sensors, lenses, and lights all-in-one, offering an easy-to-use, cost-effective line scan imaging solution.

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Near-Eye Display Test Solution

Radiant Vision Systems, Test & Measurement

The XRE Lens is a game-changer for evaluating visual quality of displays through XR headsets. Measure brightness, color, and image quality up to 70°. FOV and adjust electronic focus via software for multiple focal planes. Available in folded ("periscope") and non-folded configurations.

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Custom Microscopes and Optical Systems

Prior Scientific Inc.

Prior Scientific has developed OpenStand to offer a working platform to build OEM solutions and one-off customizations with excellent value for money and reduced development time. Whether developing new automation techniques and software or developing new imaging methods, you can quickly find that you need a microscope system tailored to your application.

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2000 Images/sec with 5 Megapixels

AOS Technologies AG

J-PRI is a high-speed, high-resolution camera that records at 5 megapixels with speeds of up to 2000 frames per second. Its groundbreaking 'pay-as-you-record' feature allows users to invest in a standard configuration camera and unlock the camera's full capabilities using a license key when needed.

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.:More News

SLSC Beamforming Reduces Bias in PA Imaging Results

Photoacoustic (PA) imaging offers a noninvasive means to obtain molecular and functional information about a variety of medical conditions. However, the quality of PA images, which are acquired when light illuminates the skin, is affected by the skin's melanin content. To mitigate skin-tone bias in PA imaging, researchers at Johns Hopkins University and the University of São Paulo developed a technique to filter unwanted signals from the images of darker, more light-absorbent skin.

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Deep Learning Delivers High-Quality Optoacoustic Images in Real Time

High-quality medical imaging from multispectral optoacoustic tomography (MSOT) could be used to diagnose and evaluate a range of diseases, including breast cancer, Duchenne muscular dystrophy, inflammatory bowel disease, and many more. However, the length of time currently required for MSOT to process high-quality images makes it impractical in clinical settings. To provide high-quality, real-time optoacoustic imaging via MSOT, researchers from the Bioengineering Center and the Computational Health Center at Helmholtz Munich and the Technical University of Munich developed DeepMB, a deep-learning framework, which expresses model-based reconstruction with a deep neural network.

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High-Powered Lasers Pegged to Advance Muon Imaging

Scientists at the Lawrence Livermore National Laboratory (LLNL) National Ignition Facility (NIF) are leading an initiative that will use high-power lasers to accelerate the time needed to capture muon images. Muons are naturally occurring subatomic particles that can penetrate very dense material far deeper than x-rays.

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Sensitive Photoacoustic Method Offers a Noninvasive Advancement

A multispectral, super-low-dose photoacoustic microscopy (SLD-PAM) system developed by City University of Hong Kong (CUHK) achieves significantly higher sensitivity than traditional optical resolution photoacoustic imaging. By providing an exceptionally high level of sensitivity, SLD-PAM could help broaden the use of photoacoustic microscopy in biomedical applications. In the future, it could also translate to clinical settings.

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Air-Leak Detection System Visualizes Building Drafts

Researchers at the Department of Energy's Oak Ridge National Laboratory (ORNL) have created a detection system that allows home energy auditors to see air leaking from a building in real time with the help of a camera. This could provide more accurate readings far more quickly than current diagnostic tools allow.

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.: Upcoming Webinars

Optimization of Surface Enhanced Spatially Offset Raman Spectroscopy for Applications in Pre-Clinical Cancer Imaging

Thu, Nov 16, 2023 1:00 PM - 2:00 PM EST

In the field of optical imaging, the ability to image tumors at depth with high selectivity and specificity remains challenging. Fay Nicolson of the Dana-Farber Cancer Institute and Harvard Medical School discusses the optimization of SORS instrumentation and imaging approaches as well as the subsequent application of SESORRS to pre-clinical cancer imaging and the delineation of tumor margins in Apcfl/+, Apcfl/+;KrasG12D/+, and finally GL261 mouse models of colorectal cancer and glioblastoma. Moreover, using a SESORRS approach, she demonstrates that it is possible to detect secondary, deeper-seated lesions through the intact skull. This approach enables improvements in the non-invasive detection of these cancers due to improvements in SNR, spectral resolution, and depth acquisition, and can complement clinically approved image-guided surgical techniques.

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