Quarterly newsletter from Photonics Media featuring the latest advancements in and applications for vision systems – from sensors to software. Manage your Photonics Media membership at Photonics.com/subscribe.

Computational Metaoptics Enable Broadband Imaging Applications

Although camera technology has advanced considerably in the last few decades, there are constant demands for higher resolution, wider field of view, and full-color operation for many consumer, medical, industrial, and military applications. At the same time, these systems require lower weight, smaller size, and reduced cost while conforming to tight manufacturing tolerances. This has made state-of-the-art cameras into incredibly complicated systems, intricately optimized to balance complexity and performance. In many cases, these demands cannot all be simultaneously satisfied, as existing refractive lenses are often bulky, expensive, and subject to manufacturing constraints that limit performance.

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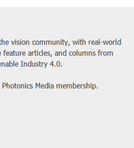
Inspecting: One Line at a Time



In addition to inspecting labels, line-scan cameras can also capture foreign objects in food, ensure that flat panels are free of defects, and help to speed up DNA analysis. Innovations in the technology include the capability to capture and merge multiple images to achieve high resolution in low light, along with incorporating multiple visible and nonvisible spectral bands to enhance vision capabilities. Software enhancements and other changes have also made line-scan cameras easier to use.

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Sensor Innovations Drive Expansion into New Markets

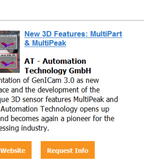

Image sensors are part of every smartphone and may seem to be a ubiquitous, mature technology — however, this is far from the case. While conventional CMOS detectors for visible light are well established, extensive opportunities exist for more complex and innovative image sensing hardware to offer capabilities beyond simply acquiring the intensity values at each pixel.

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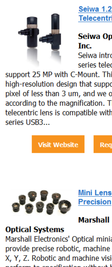
About *Vision Spectra*



Vision Spectra is a global resource geared for the vision community, with real-world case studies of vision in action, comprehensive feature articles, and columns from experts in the field examining the trends that enable Industry 4.0.

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.: Featured Products

100 GigE Camera: 542 fps at 21 MP

Emergent Vision Technologies Inc.

Bring your machine vision system to new heights with the 100 GigE HZ-21000-G camera. Through a QSFP28–100 GigE interface, the camera captures 21 MP images at up to 542 fps while offering low CPU utilization, low latency, low jitter, and ultra-high data/frame rates, with cabling options for any length.

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New 3D Features: MultiPart & MultiPeak

AT - Automation Technology GmbH

With the implentation of GenICam 3.0 as new standard interface and the development of the worldwide unique 3D sensor features MultiPeak and MultiPart AT – Automation Technology opens up new horizons and becomes again a pioneer for the 3D image processing industry.

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Seiwa 1.2 inches HR Telecentric Lens

Seiwa Optical America Inc.

Seiwa introduces New FHL series telecentric lenses which support 25 MP with C-Mount. This FHL series has a high-resolution design that supports sensors with a pixel of less than 3 um, and we offer five models according to the magnification. The New FHL series telecentric lens is compatible with the BU2409M series USB3...

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FASTCAM NOVA R5-4K

Photron USA Inc.

Meet the world's fastest 4K High-Speed Camera, the FASTCAM Nova R5-4k from Photron. The FASTCAM Nova R5-4K provides 12-bit image recording rates up to 1,250 fps at 4K (4096 x 2304) resolution. Rated at ISO 10,000 monochrome and ISO 5,000 color, the camera has outstanding light sensitivity.

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Mini Lenses for Robotic Precision

Marshall Electronics Inc., Optical Systems

Marshall Electronics' Optical miniature lenses provide precise robotic, machine vision positioning X, Y, Z. Robotic and machine vision products cannot perform to specification without high and consistent optical performance. Our high quality glass element aluminum housing lenses, with and without glass filter produced in...

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High-Speed Line Scan Cameras

Chromasens GmbH

allPIXA evo 8K/10K/15k camera series from Chromasens comes with CMOS sensors, TDI options for color/mono and line rates up to 90 kHz in full color. With the Dual 10 GigE interface it's the best choice for cost-efficient high speed and high resolution web applications. Short delivery times available!

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Baumer AX. AI Ready Smart Camera with NVIDIA Jetson Modules

Baumer Optronic GmbH

Baumer presents the AX smart cameras, its first industrial-grade smart cameras that combine the market-leading NVIDIA Jetson modules with powerful Sony CMOS sensors to create a compact, flexible, and freely programmable image processing platform for AI applications.

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Alluxa Ultra Series Filters and Coatings

Alluxa

Alluxa Ultra Series Filters, including Narrowband, Dichroic, UV, IR, and Notch filters, provide the highest performance optical thin film solutions available today. For example, the Ultra Series Flat Top Narrowband filters offer the narrowest bandwidths and squarest filter profiles in the industry.

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.: More Vision News

Imaging Method Gauges Quality of 3D-Printed Metal

Researchers at Nanyang Technological University developed a fast, low-cost imaging method that can analyze the structure of 3D-printed metal parts to assess the quality of the material. The system uses an optical camera, a light source, and a notebook computer running a proprietary machine-learning software developed by the team.

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Quantum Dot-Based Sensor Captures More Light

Researchers from Chung-Ang University introduced a photodetector integrated into a dense sensor array for high-resolution multispectral (color) imaging. The technology uses quantum dots to overcome the space-consuming design of current sensors.

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Simple Camera Setup Enables 3D Human Shape Reconstruction

Researchers from Kaunas University of Technology proposed a deep-learning-based method for the three-dimensional human shape reconstruction when the original figure is only partly visible. The method is relatively low cost, provides high compression of the images obtained, and is easily integrated with existing virtual reality tools. The method was developed using a real-world data set. A clinical trial is pending.

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.: Next issue:

Features

Sensor Sockets in System Design, X-Ray/NIR Spectroscopy, Optimizing Inspection, and more.

Photonics Media is currently seeking technical feature articles on a variety of topics for publication in our magazine *Vision Spectra*. Please submit an informal 100-word abstract to visionspectra@photonics.com, or use our online submission form www.photonics.com/submitfeature.aspx.