

IMAGING

Tech Pulse



May 2016

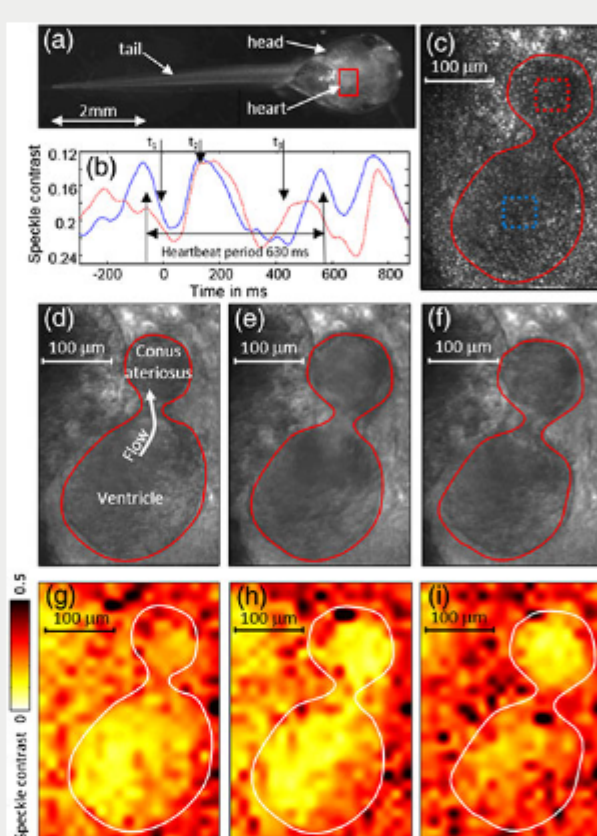
Imaging Tech Pulse is a special edition newsletter from Photonics Media and PCO-TECH Inc. covering key developments in imaging technology.

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VESCEL-Based Laser Achieves Single-Source Multimodal Imaging

A solid-state degenerate laser system that can provide efficient methods of coherence switching has demonstrated the ability to provide both speckled and speckle-free images. The technology enables multimodality imaging from a single laser, where low spatial coherence illumination can be used for traditional high-speed videomicroscopy and high spatial coherence illumination for extracting dynamic information of flow processes. Although multimodality imaging has been achieved previously using different light sources, it has been challenging to maintain optical alignment during switching and adjust for mismatches in illumination intensity.



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PCO-TECH Inc.

Something revolutionary, something well-tried – and the advancement of uniting them!

A new level of ultra-fast data transfer bridging great distances with maximum data security and stability: Those aspects are just a few of the many benefits of Camera Link HS interface, that was specifically designed to meet the requirements of vision and imaging applications for both today and tomorrow.

What is Camera Link HS (CLHS)?
Camera Link HS is designed to specifically meet the needs of vision and imaging applications. It provides low latency, low jitter, real-time signals between a camera and a frame grabber while carrying image data, control data and trigger events. The interface builds upon the key strengths of Camera Link by adding new features and functions to meet the needs of today and tomorrow. Camera Link HS is designed as a system ensuring that CMOS sensor technology can be fully exploited, while providing cost-effective cameras and frame grabbers that are easy to use. Reliability and security liability risks demanded for customers!

Benefits

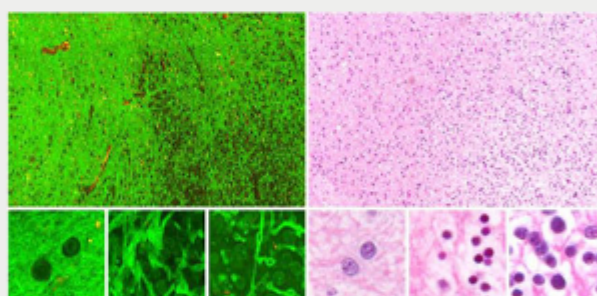
- More bandwidth**
 - Effective bandwidth of about 1000 Mbps (2x4B x Protocol = 100) results nearly three times as USB 3.0 bandwidth.
- More robust connection**
 - No communication error at a bit error rate (BER) of 10⁻¹⁵
 - Forward Error Correction (FEC) corrects burst errors of up to 15 bits on the fly
 - FEC technology suppresses packet retransmission for data reliability
 - Fiber Optic Link (FOL) provides high resistance to EMI and allows long cable lengths with the best signal integrity
- More distance**
 - Cable length more than 300m using multimode fiber
 - Cable length more than 10km with single mode fiber
- More flexibility**
 - Real-time trigger over cable with extremely low jitter
 - Plug-and-play with cameras and sensors
 - Using standard LC-connector for flexible cable decision
- More open**
 - Use full CSI-40 specification is downloadable for free
 - API is open is available for fast compact FPGA implementation (Xilinx, Altera, Lattice)
- More cost effective**
 - The use of standard network hardware components such as enhanced small form-factor SFPs, Gigabit Ethernet controllers from multiple vendors allows multi-vendor
 - Interoperable licensing

Are your fields of application located in the science, physics or other research areas demanding high quantum efficiency, high bandwidth and ideally a small form factor? Then combine power and experience for pco.edge camera systems with Camera Link HS data interface.

pco.

Third-Harmonic Generation Microscopy Provides In Situ Brain Tumor Imaging

A technique involving third-harmonic generation microscopy could allow neurosurgeons to image and assess brain tumor boundaries during surgery, providing optical biopsies in near-real time and increasing the accuracy of tissue removal. Pathologists typically use staining methods, in which chemicals like hematoxylin and eosin turn different tissue components blue and red, revealing its structure and whether there are any tumor cells. A definitive diagnosis can take up to 24 hours, meaning surgeons may not realize some cancerous tissue has escaped from their attention until after surgery -- requiring a second operation and more risk.



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Robust Technique for Ghost-Imaging in the Time Domain

A technique for producing ghost-imaging in the time domain offers promise for the dynamic imaging of ultrafast waveforms with applications in communications, remote sensing and ultrafast spectroscopy. Researchers from the Tampere University of Technology and the University of Eastern Finland have demonstrated how ultrafast pulses that carry information over durations <1 billionth of a second can be detected without actually "seeing" those pulses directly. The method correlates in time the intensity of two light beams, neither of which independently carries information about the signal.



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IR Imaging Differentiates Skin from Other Materials

Systems using IR wavelengths to distinguish skin from other materials hold promise for improving search and rescue efforts and defending against efforts to deceive biometric systems. The proliferation of face-recognizing biometric systems for security — in settings ranging from public buildings and transportation to secure data centers — has, in turn, fueled efforts to circumvent or outwit these systems. Conventional imaging systems can be deceived by masks or other facial reproductions because they verify faces by comparing a reference image to a captured image, which can be falsified.



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