

HSI 2016

Conference Hyperspectral Imaging and Applications

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Abstract

xiSpec Hyperspectral Snapshot mosaic and Multi-Linescan Cameras



In addition to the classical technique of so-called bushbroom technologies to build hyperspectral camera systems, hyperspectral sensors of IMEC, Belgium using individual interference filters in various configurations on each pixel on a normal silicon sensor have been available for about 2 years.

Based on this sensors extremely small, robust and easy-to-use hyperspectral imaging (HSI) cameras are available. Because of the small size, minimal weight and low power consumption, new mobile devices can be realized.

Two different kinds of these sensors can be used:

Snaphot mosaic sensors

Comparable with a standard RGB-Bayer pattern two different pattern of 4*4 or 5*5 different narrow band in visible light or NIR build a novel solution for non-scanning hyperspectral applications.

With this technology it is possible to get a complete hyperspectral image cube with only one single image acquisition. High-speed multispectral imaging for realtime applications can be realized with frame rates up to 170 frames per second.

Line scan sensors

Instead of using a mosaic pattern of hyperspectral filters, this camera features a line-wise arrangement of 100 or 150 HSI bands in NIR or visible light and NIR. Thanks to the high frame rate of the image sensor, this camera enables detailed and crisp captures of moving objects at multiple wavelengths.

The advantage of this technique is that movements can be optically detected and compensated by stitching. This can be obtained accurate, high spatial resolution images.

The presentation will introduce and demonstrate this camera technology and methods to interpret the data grabbed from the sensor, which data correction steps have to be performed to get stable usable results.

Furthermore, the known main areas of application are to be displayed:

- Precise agriculture
- Medical
- Industrial (e.g. food sorting, prevent / detect product piracy)
- security

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About Ximea

Drawing on two decades of experience in the industry, XIMEA offer consists of state-of-the-art cameras with USB 3.0, USB 2.0, PCI Express and FireWire interface as well as X-RAY, Hyperspectral and Thunderbolt™ technology enabled cameras.

For more than 20 years XIMEA has developed, manufactured and sold standard or OEM cameras for machine vision applications in motion control, assembly, robotics, industrial inspection and security, as well as scientific grade cameras for life science and microscopy.

The main distinction is based on extremely robust way the cameras are built while still providing highest speed like for example the USB3 Vision camera line. Learn more about XIMEA at www.ximea.com