HYPERSPECTRAL TECHNOLOGY FOR REAL-WORLD APPLICATIONS

Hyperspectral cameras, compared to traditional cameras, divide the light spectrum into many small wavelength bands. Therefore, a hyperspectral camera captures the spectral fingerprint of an object, a unique spectral curve giving very detailed information about its exact constitution.

By combining imec’s hyperspectral filters processing capabilities with its extensive image processing and systems design expertise, our engineers have developed a unique hyperspectral imaging evaluation system that matches with industrial end-application requirements.

KEY BENEFITS

- **Easy set-up** of the complete system
- **Ready-to-use solution**: instantly collect hyperspectral data from your samples and determine spectral band differentiators
- **Flexible configuration**: quickly modify the set-up once you get more acquainted with the hyperspectral imaging technology
- **Video-rate** acquisition of hyperspectral imaging data cubes

SNAPSHOT MOSAIC HYPERSPECTRAL IMAGING CAMERA

Imec’s hyperspectral evaluation system offers simple, fast, and easy application set-up for your hyperspectral scanning and analysis of sample materials. Our solution is flexible and designed to enable application development using hyperspectral imaging technology, delivering relevant test data already within a few days after initial installation. It includes all required components, from imager to camera, lens, cable interface and software and can be easily rebuilt into different configurations.

**Packaged hyperspectral snapshot mosaic, 16 and 25 bands**
The current hyperspectral imager is built on a commercially available CMOS image sensor for the machine vision market. The imager specifications are listed on the right.

The user interface of imec’s in-house software is designed for user-friendly hyperspectral imaging operations.

**APPLICATIONS**

- Optical sorting in machine vision
- Chemical analysis of material composition
- Food safety and inspection
- Medical & healthcare
- Pharmaceutical manufacturing
- Semiconductor & photovoltaic
- Waste recycling
- Human machine interface
- Minerology & mining
- Precision agriculture

**THE EVALUATION SYSTEM CONSISTS OF THE FOLLOWING ELEMENTS:**

- Imec hyperspectral imager
- USB3.0 xIQ camera from XIMEA
- Standard C-mount and selection of foreoptics available (35mm lens and cut-off/blocking filters)
- Interface cables, tripod mount
- Reflectance tile
- Hyperspectral imaging software enabling HSI data-cube reconstruction at video rates and on a user-friendly USB3.0 laptop (laptop not included in the demo-kit)

**IMEC SNAPSHOT MOSAIC IMAGER SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
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<tbody>
<tr>
<td>Wavelength range</td>
<td>470-630nm (VIS) or 600-1000nm (NIR)</td>
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<tr>
<td>Number of spectral bands</td>
<td>4x4 = 16 bands (VIS) or 5x5 = 25 bands (NIR)</td>
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<tr>
<td>Bandwidth per band (FWHM)</td>
<td>&lt;15nm collimated</td>
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<td>Base imager type</td>
<td>CMOS imager, CMOSIS CMV2000 based</td>
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<tr>
<td>Spatial resolution</td>
<td>512x256 per band (VIS) or 409x216 per band (NIR)</td>
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<tr>
<td>Frame rate</td>
<td>Up to 180 hyperspectral cubes/second</td>
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<tr>
<td>Pixel pitch</td>
<td>5.5μm</td>
</tr>
<tr>
<td>Bit depth</td>
<td>10 bit</td>
</tr>
<tr>
<td>Optical input</td>
<td>(near) telecentric 35mm lens</td>
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**HYPERSPECTRAL IMAGER & SOFTWARE**

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