



mmeC

EPIC ON-LINE TECHNOLOGY MEETING – HYPERSPECTRAL

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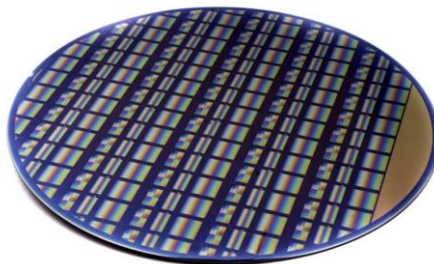
IMEC IN HYPERSPECTRAL IMAGING

SUMMARY



WHAT

Development and production of hyperspectral solutions



HOW

Wafer-level spectral filter integration
System level design



OFFERING

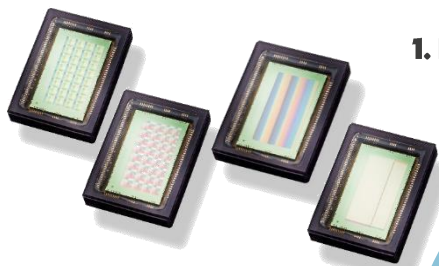
Spectral camera systems & sensors
Custom hyperspectral sensors development

IMEC APPROACH

SPECTRAL IMAGING SOLUTION

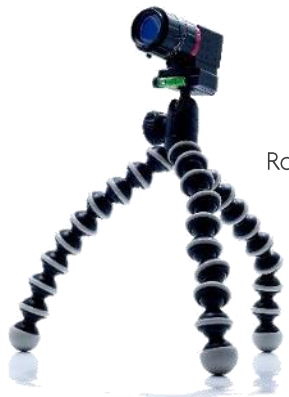
1. Hyperspectral sensors from IMEC

Pixel level pattern, clean & robust



2. Industrial cameras from partners

Robust, high-speed, low noise, volume production



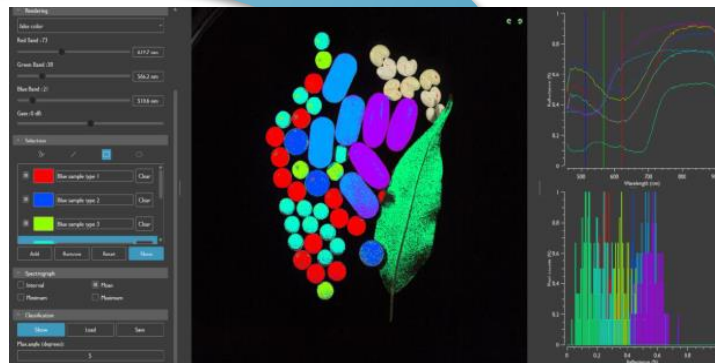
3. Research cameras from IMEC "Snapscan"

IMEC electrical / optical / mechanical / thermal system design



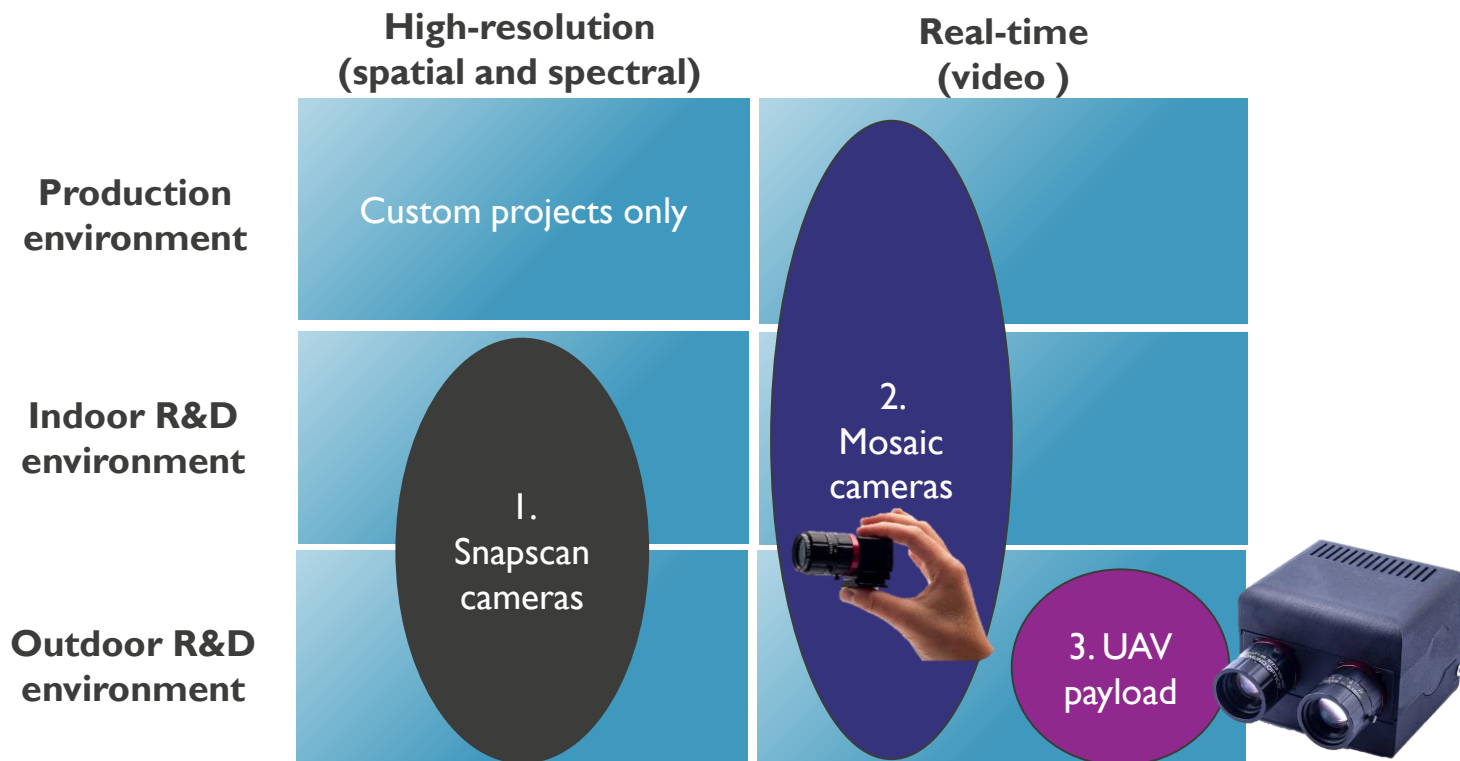
4. Software & Calibration from IMEC

High-quality hypercube acquisition, visualization and analysis



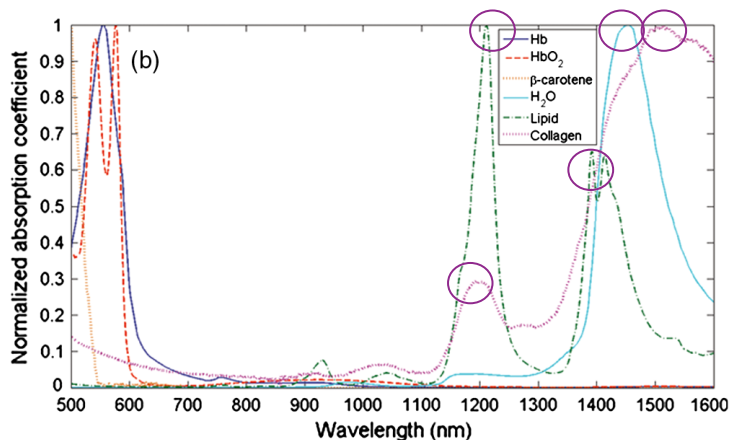
IMEC HYPERSPECTRAL IMAGING APPROACH

3 FAMILIES OF PRODUCTS



WHY EXTENDING TO SWIR?

HIGH CONTRASTS IN THAT REGION



Review of short-wave infrared spectroscopy and imaging methods for biological tissue characterization.

[J. of Biomedical Optics, 20\(3\), 030901 \(2015\)](#)

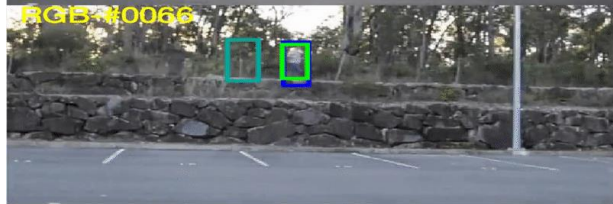
1. Important components show strong absorption peaks in the SWIR

- Water
- Lipids
- Collagen
- Protein
- Plastics
- Minerals....

2. Infrared image has no color!

WHY REAL-TIME HYPERSPECTRAL VIDEO?

EXAMPLE: IMPROVING TRACKING ACCURACY



DMT BACF ECO GroundTruth



DMT BACF ECO GroundTruth



DMT BACF ECO GroundTruth

Material based tracker (in red) use material signature, contrary to color trackers
 Highest accuracy out of 10 trackers in background clutter, deformation or rotation conditions
 Higher accuracy when trackers are extended to hyperspectral video

AUCs OF EXTENDED MATERIAL BASED TRACKERS

Trackers	RGB	False-Color	Hyperspectral
ECO	0.586	0.587	0.600
KCF	0.386	0.352	0.393

Dynamic Material-Aware Object Tracking in Hyperspectral Videos

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