VISION SYSTEMS DESIGN 2020 Innovators Awards GOLD

INNOVATORS AWARDS 2020 LaserFocusWorld PLATINUM HONOREE

Headwall

Hyperspec® MV.X

The Future of Food

Visualize Value at

From specialty crops to seafood and poultry, the global food industry adopts advanced tools to ensure the quality and safety of food supplies.

Hyperspectral imaging (HSI) has been gaining ground as a technique that enables food processors to apply advanced automated sorting and inspection solutions to alleviate some of the most tedious and labor-intensive tasks. Collecting highly resolved spectral information for each pixel in the image enables the detection of slight differences in color or composition to improve sorting and grading decisions. Spectral data collected in near-infrared helps detect or quantify features that traditional vision techniques cannot see.

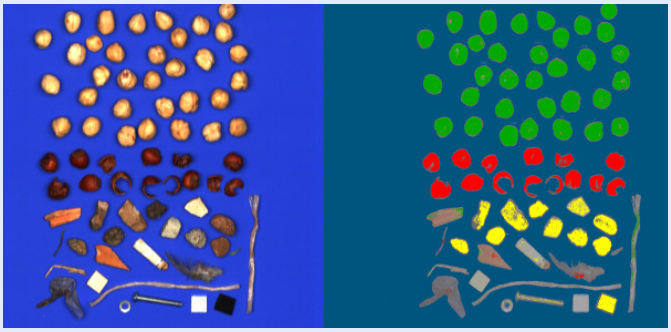
Hyperspectral systems have historically faced significant hurdles in industrial deployment due to the need to handle vast amounts of raw data as well as the complexity of model development. Headwall's award winning MV.X technology platform overcomes these obstacles by combining a high performance spectrometer with powerful embedded computing to extract actionable results in real time.

Machine learning and artificial intelligence powered perClass® MIRA software performs runtime processing and makes model development very intuitive. The web user interface of the MV.X allows for remote control and maintenance of the system.

Packaged in a compact, dust, and watertight housing, the MV.X system is designed to be used in advanced machine vision, quality monitoring, and process analytical applications. This rugged solution can be installed in both inside and outside production environments.

FOREIGN OBJECT DETECTION

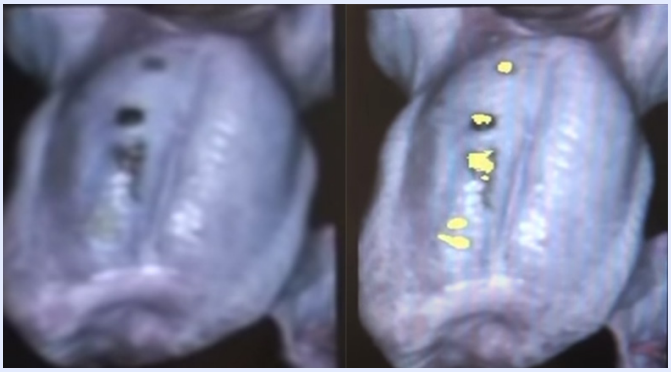
While most foreign objects can be separated during initial screening, objects that are similar in appearance to quality product are often very hard to catch. Final sorting of products, like tree nuts, can benefit from the power of HSI. Processors can both optimize their use of manpower and improve quality by adopting automation powered by HSI vision.



(Left) Raw image of hazelnuts, shells, & foreign objects.
(Right) Classified image showing good product, shells, & two types of foreign objects.

CONTAMINATION DETECTION

From a regulatory perspective, few industries depend on rigorous inspection more than poultry and meat processing. Use of HSI to inspect poultry for wholesomeness, detection of fecal contamination, septicemia, and skin tumors early in the process can help save significant processing costs and reduce risk of recalls. When processing livestock, the technique helps accurately pinpoint areas on a carcass that require attention.



Detection of fecal contamination & skin tumors in poultry.

the Speed of Light

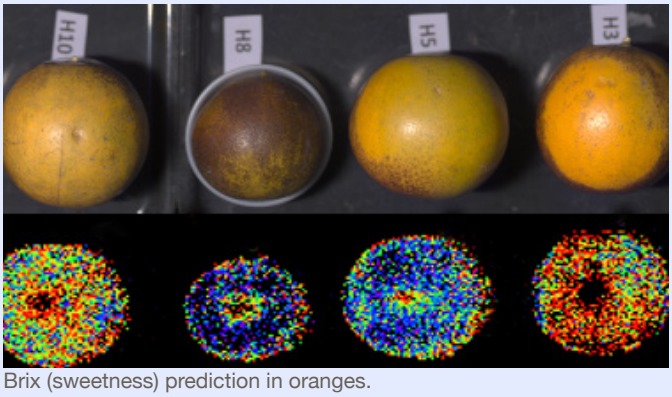
SORTING & GRADING

The repeatability of digital HSI helps automate tasks that previously could only be performed manually. The MV.X solves these challenging problems and enables the deployment of automation to reduce costs, improve quality, and increase consistency of grading for tree nuts, berries, and a variety of other food and non-food products.

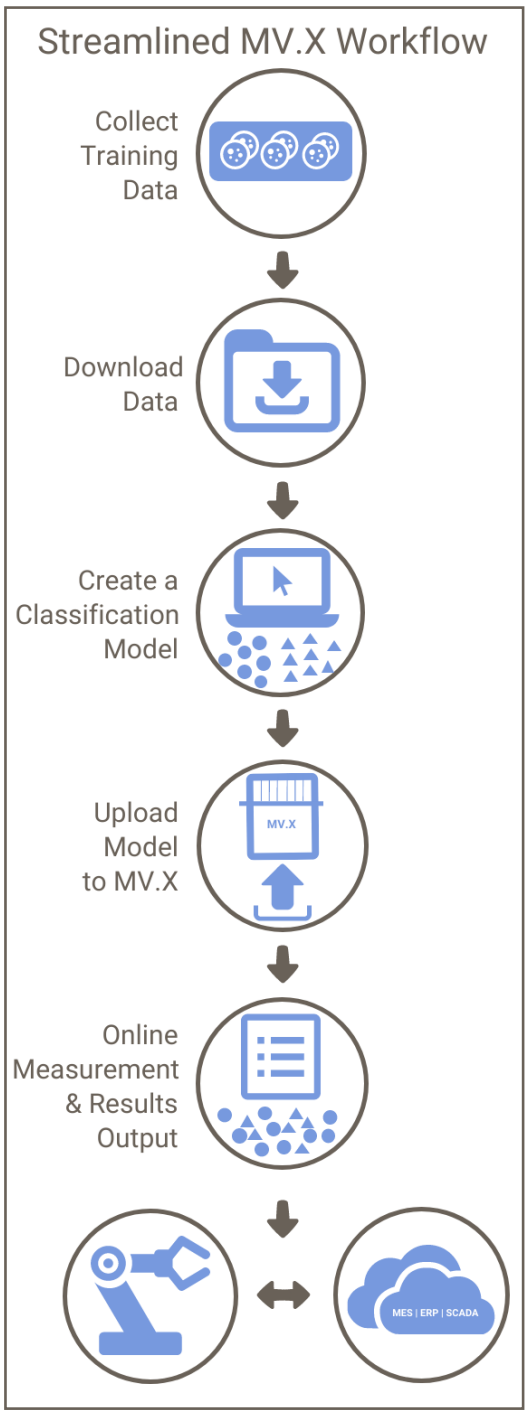
Sorting & removing defective almonds.

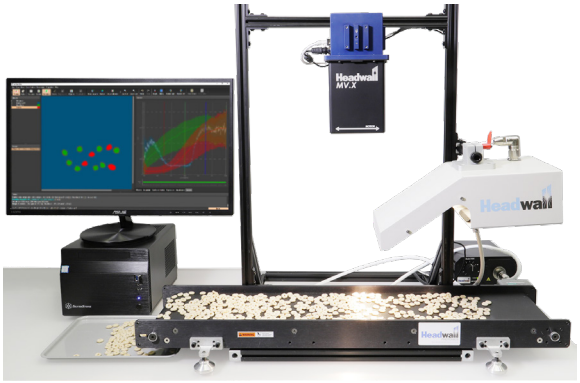
PROCESS ANALYTICS

Deployment of process analytical technologies in food and pharmaceuticals is accelerated by the growing adoption of Industry 4.0 concepts. The MV.X can be networked directly into plant controls. It can serve as a non-contact, real time analytical solution for prediction of product characteristics, including sweetness, pH, intramuscular fat content, histamine levels, and other critical attributes that traditionally require sampling and laboratory testing.



Brix (sweetness) prediction in oranges.





MV.X system installed over a small conveyor used for off-line development of classification methods.

DATA SHEET

The award winning **Hyperspec® MV.X VNIR** system introduces to the industry a fully integrated hyperspectral imaging system that enables users to realize the value of spatial and spectral information in applications like machine vision, contactless product quality monitoring, counterfeit detection, and process analytics.
Designed for use in harsh industrial environments and capable of functioning both inside and outside, the MV.X offers simplicity of installation and direct output of actionable results.

Hyperspec® MV.X		
Wavelength Range	400-1000 nm	
Spatial Bands	1020	
Spectral Bands	340	
Spectral Sampling	1.75 nm/pixel	
Spectral FWHM	6 nm	
System F/#	f/2.5	
Optical Design	Aberration-corrected concentric	
Field of View	Angular	Instantaneous
24mm focal length lens	14.20°	0.014°
16mm focal length lens	21.16°	0.21°
Other lenses available		
Bit Depth	12 bit	
Interfaces	Gen<i>Cam MQTT RS232/422* 5V TTL*	
Ports	RJ45 (GigE) x2 D-Sub 26 pin (GPIO)	
Software	Web User Interface for system configuration and control. On-board classification modules available.	
Camera Sensor Technology	CMOS	
Memory, Storage	8GB RAM, 128GB SSD	
Input Voltage	12-30V DC	
Max Power Consumption	< 42 W	
Dimensions (L x W x H)	255 x 136 x 136 mm / 10.0 x 5.4 x 5.4”	
Weight with 24 mm Lens	3 kg / 6.6 lb	
Ingress Protection (IP) Rating	IP66, IP67	
Operating Temperature Range	0 - 50°C / 32 - 122°F	
Storage Temperature Range	-10 - 60°C / 14 - 140°F	

*In Development

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