SiftAI® Multi-Lane Sorter

KPM | SMARTVISIONWORKS

AI-POWERED SORTING, SIZING, & GRADING OF FRESH PRODUCE

Fast, Reliable, & Automated Optical Inspection to Maximize Productivity & Profits

OVERVIEW

Leveraging artificial intelligence, the SiftAI® Multi-Lane Sorter System identifies defects and accurately sorts your products by size, grade, and other programmable features. As products pass below the SiftAI® camera, the system instantly records reliable information on quality, size, texture, color, or whatever else is needed. Based on the AI model criteria, the system automatically routes products to their various drop-off lanes in the sorting line.

Faster, more reliable, and more cost-effective than human graders or other vision systems on the market, the SiftAI® Multi-Lane Sorter integrates seamlessly as drop-in replacement on your existing sorter, significantly transforming and enhancing your operations.

APPLICATIONS FOR SIFTAI® ARTIFICIAL INTELLIGENCE

The SiftAI® is a compact vision system that houses a high-performance camera, a computer, an AI accelerator, and an I/O board. Installed directly in processing lines, SiftAI® technologies detect product defects and quality control issues in real-time. Typical SiftAI® Multi-Lane Sorting applications include:

- Potatoes (all types)
- Fresh fruits (apples, citrus, and more).
- Hearty root vegetables

SIFTAI® SYSTEM BENEFITS

- **Improved throughput & waste reduction:** Operate at higher capacity while improving the accuracy of product sizing and grading.
- **Decreased labor costs and time constraints:** Automated AI-powered technology sorts and grades products with accuracies equal or greater than human inspectors.
- **Superior process control:** Real-time analysis and record keeping aid in business decisions and vetting of suppliers.
- **Accurately inspect products with mass variation:** While other inspection systems struggle with mass variation, SiftAI® accounts for natural product variations, effectively discerning between defected and viable products.

SIFTAI® SYSTEM FEATURES

- Proven AI models and industry-leading defect list for precise control of defect sorting to ensure food safety and grading accuracy.
- System software continually logs data on foreign objects detected, defects, throughput metrics, and size distributions. Built-in reports and AI data capability available.
- Integrate with ejection or diverting mechanisms including air jets, drop or lift nose bars, sweep arms, and more.
- Manufactured and supported in the USA.

Raw image

Pressure bruise highlighted

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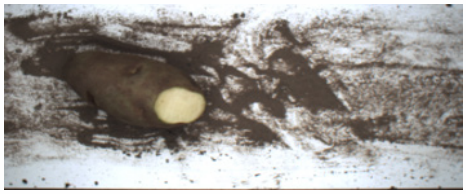
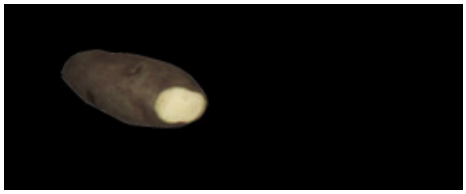
IF YOU CAN SEE IT, SIFTAI® WILL FIND IT

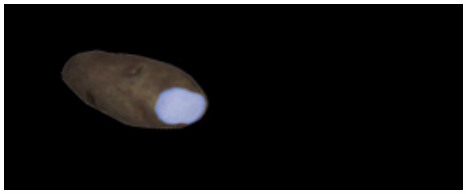
The SiftAI® Multi-Lane Sorter is a powerful machine vision platform that offers superior vision inspection. Our technologies incorporate vision inspection equipment positioned on the processing line, which captures real-time product images that are analyzed in our proprietary software. This software is equipped with AI models to detect specific product features passing through a conveyor system. If a defect is detected, the system automatically calculates the percentage defect, which triggers actions later in the process.



Raw image of product on the conveyor.



AI segmentation.



AI segmentation with defect detected.

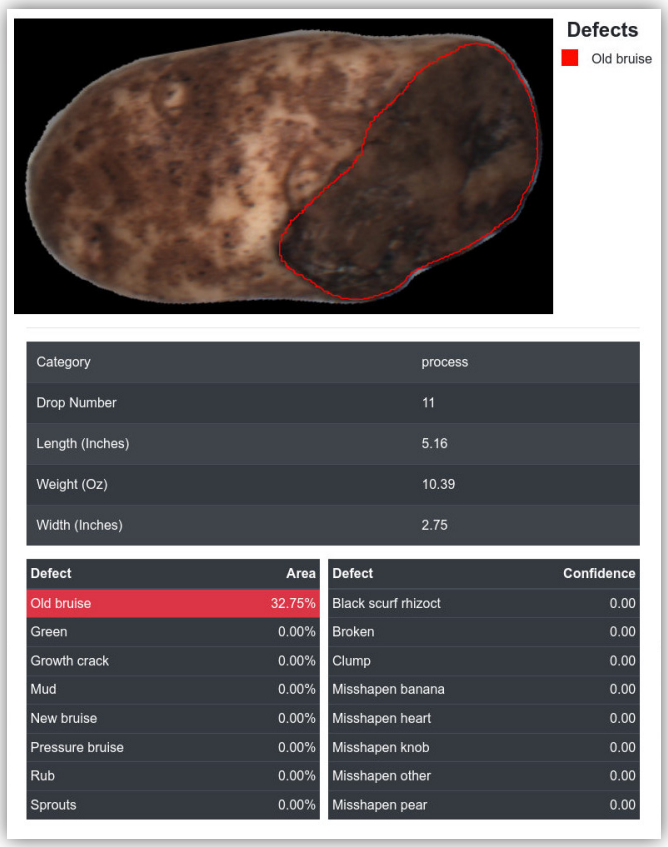
COMMON ANALYZED DEFECTS WITH THE SIFTAI® MULTI-LANE SORTER:

Russet Potato Defects

- Dry rot
- Scab
- Old bruise
- New bruise
- Green
- Misshapen (pear, banana, heart, knob)
- Rodent damage
- Pressure bruise
- Rhizoc
- Skinning/rub
- Air checks
- Lenticil (enlarged)
- Sprouts
- Nematode
- Cut/broken

Varietal Defects

- Green
- Misshapen
- Old bruise
- New bruise
- Lenticil
- Rot
- Dry rot
- Pressure bruise



Category	process
Drop Number	11
Length (Inches)	5.16
Weight (Oz)	10.39
Width (Inches)	2.75

Defect	Area
Old bruise	32.75%
Green	0.00%
Growth crack	0.00%
Mud	0.00%
New bruise	0.00%
Pressure bruise	0.00%
Rub	0.00%
Sprouts	0.00%

Defect	Confidence
Black scurf rhizoct	0.00
Broken	0.00
Clump	0.00
Misshapen banana	0.00
Misshapen heart	0.00
Misshapen knob	0.00
Misshapen other	0.00
Misshapen pear	0.00

Detailed defect analysis.

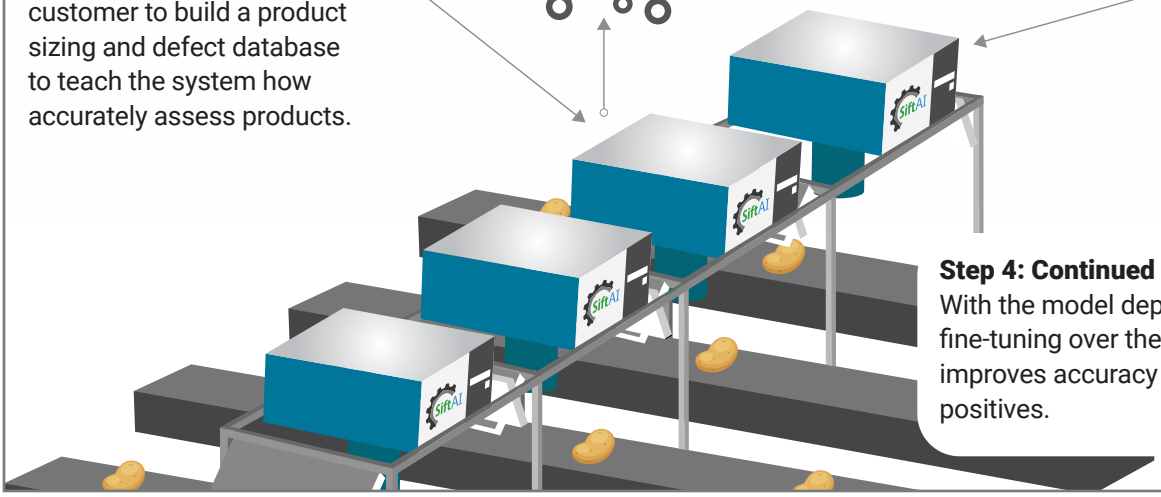
SiftAI® Multi-Lane Sorter

UNIQUE AI MODEL DEVELOPMENT & DEPLOYMENT

Step 1: AI Training
After installation, KPM's AI developers work with the customer to build a product sizing and defect database to teach the system how accurately assess products.

Step 2: Initial AI Performance Monitoring
With the AI in place, test runs are recorded and monitored remotely by KPM AI developers.

Step 3: AI Model Augmentation
KPM AI developers can make improvements to the models based on the AI's performance and customer expectations.

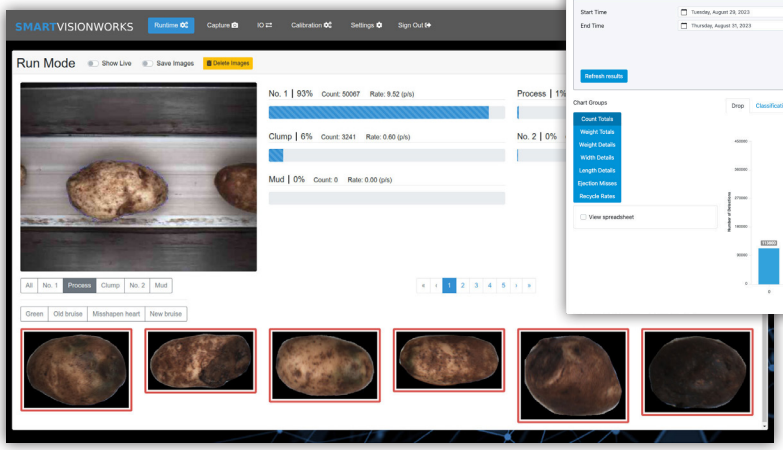


Step 4: Continued Refinement
With the model deployed on the line, fine-tuning over the system's life improves accuracy and reduces false positives.

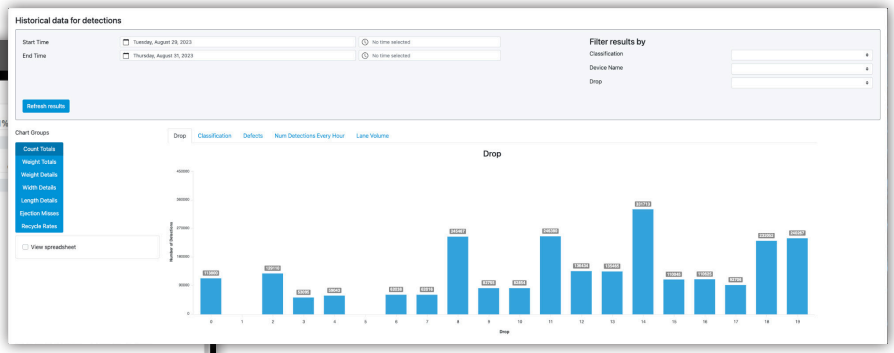
SIMPLE SOFTWARE INTERFACE & REPORTING CAPABILITIES

From the at-line Human Machine Interface (HMI), the operator can monitor the inspection in real time. The system saves images of identified defects which the operator can review in detail and label for training and analytics.

Additionally, with the Lane Monitoring application within the software, users can monitor the overall health and performance of the sorting system, providing reports on count totals by drop, ejection misses, weight totals, and more. This helps operators better maintain their machines while improving decision making and react to issues fast.



Observe the product stream in real time.



Monitor the counts for each drop to make downstream process decisions (with the Lane Monitoring software add-on).

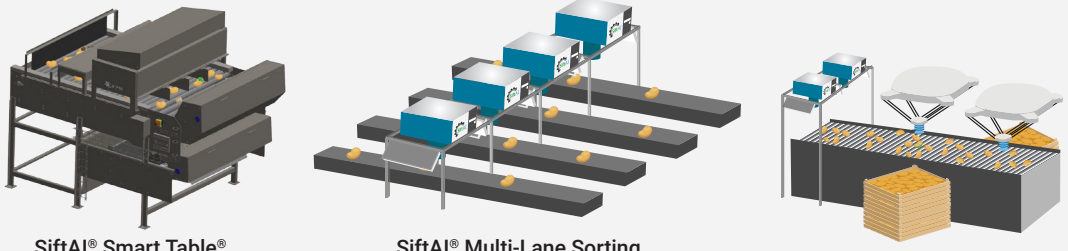
ONLINE SUPPORT

The Software as a Service (SaaS) is a yearly subscription service that includes regular software, security, and AI model updates. This provides customers with the most up-to-date technology for high accuracy and precision. KPM support engineers can access customer systems remotely to send routine updates and help answer any questions that arise.

COMPLETE SOLUTIONS FROM ONE SUPPLIER

SiftAI® Multi-Lane Sorter is only one part of a complete line of solutions KPM Analytics offers to potato processors. From pre-sorting to downstream sorting, sizing, and grading, through final product inspection, SiftAI® offers comprehensive and automated quality control that allows processors to achieve higher throughput with superior accuracy and reduced labor.

PRE-SORTING → LANE SORTING → FINAL INSPECTION



SiftAI® Smart Table®

SiftAI® Multi-Lane Sorting

SiftAI® Robotic Sorter OR
SiftAI® Smart Table®

SPECIFICATIONS

Dimensions	Customizable depending on belt width
Operating Temperature	Between 0-43° C (32-100° F)
Acceptable Sanitation Chemicals	EnviroKlor Plus, Acidiquat 4, Redi-Solve B, One Step Alkali, Decon-7, and more
Power Requirements	120V or 240V
Network Connection	Ethernet; minimum internet connection speed of 50 Mbps
IP Rating	IP69K

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