



Visia Feedstock Intelligence

Aoife Duna, Head of Revenue

Agenda

- Overview of Visia Technology
- Use Cases
- Implementation Process
- Q&A

Overview

Our Mission is To Make Recycling Operations Safer and More Productive



Raghav Mecheri
CEO
Columbia '22



James Bollas
CTO
Columbia '22

Founded in 2022, raised **\$13M** in VC funding

Deployed at 30+ sites across waste and recycling verticals

Advisors include leaders from [WM](#), [SWANA](#), [NWRA](#), [Schupan](#), [Cape](#), [Snap](#), and [X](#)

Our team has 25+ years of experience at



Currently Deployed at 30+ Locations Across Recycling Verticals



Our Focus

Today, Material Composition For Recyclers Is Unpredictable

This creates several operational challenges



Burden depth leads to **limited visibility** into materials



Visible hazards like gas tanks & heaters cause **downtime**



Occluded prohibitives like batteries cause **fires**



Limited inbound data **hamstrings** process automation



Delayed ops feedback due to lack of material data



Manual compliance processes lead to **added costs**



Visia: AI Tailored To Your Recycling Operations

Hardware

Suite of sensor modules based on your use cases



CCTV



Conveyor
X-ray



Sprinter
X-ray



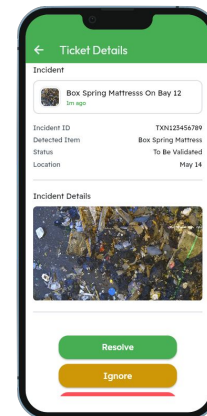
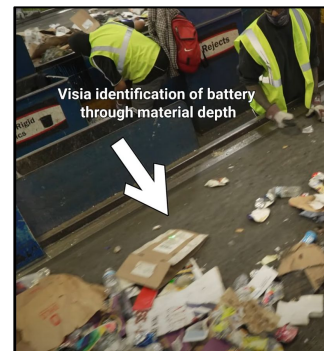
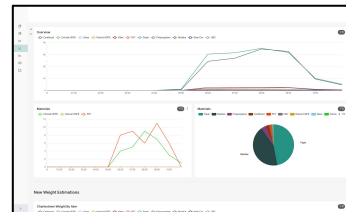
Cargo X-ray

AI

State-of-the-art AI platform

- Base dataset of **100m+** samples
- Robust model tooling (**ex:** false positive reduction)
- Software-defined AI audit tools
- Localized models trained for your facility

Custom Alerting and Analytics



Visia Use Cases



Rumpke Cincinnati MRF: X-ray to Detect Batteries and Propane Tanks

Case Study: Rumpke Waste & Recycling (MRF)

Status Quo: MRFs see significant problems with:

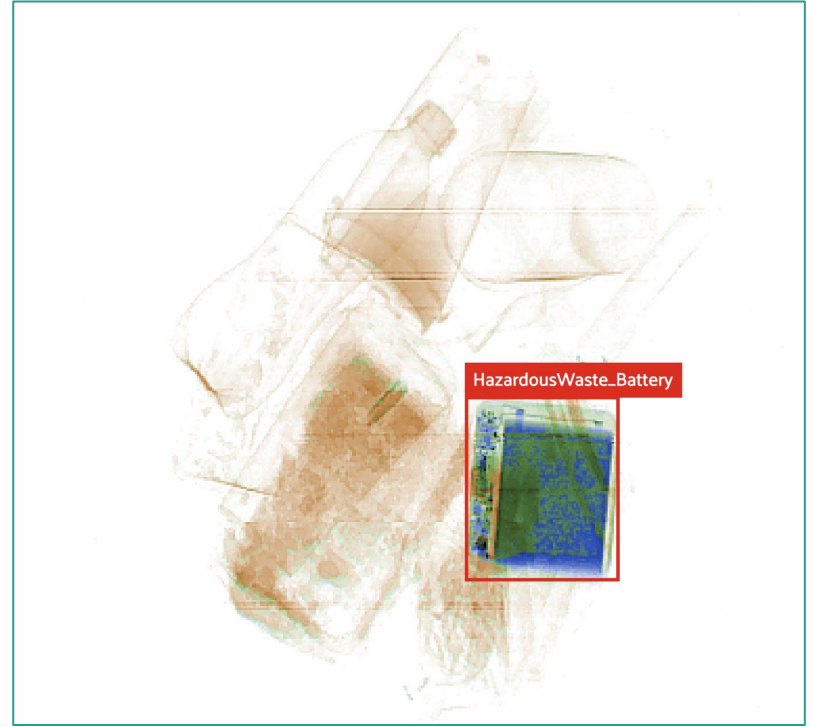
- a) Hazards like batteries & needles in their material
- b) Collecting accurate composition data & reporting

Hazard Automation: An AI-powered X-ray module powered analyzes Rumpke's through the pre-sort and and alerts on hazards via laser pointer

Impact:

- **>150** hazards detected & removed per day
- **Complete** visibility into inbound material
- **Significant** decrease in facility downtime
- Collaborating to lower insurance premiums







View image



Select

Detection

View in context

Copy frame URL

Report



Lead acid
battery
detected by
ML algorithm



Detection Details (1)

(use up/down arrow keys to scroll, press C to copy)

Category Name

Lead Acid Battery

Id

0bf5d039-54fc-42b0-af7c-b79d238045fc

Tracking Id

N/A

Score

1.00

Filtered By

N/A

Model Name

Frame Event Id: 01946a40-42fb-782c-a0b2-55c969d7f0ad

Frame URI: gs://ingestion_prod/frames/120d-2025-01-15T13:56:25.93430126Z-142.jpg

Model URI: rumpke_v2_0

Annotation Status: Not Annotated

Daily Battery Count

1

Wednesday Aug 13

194

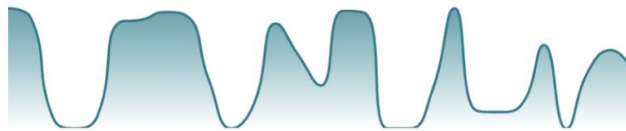


Daily Gas Tank Count

1

Wednesday Aug 13

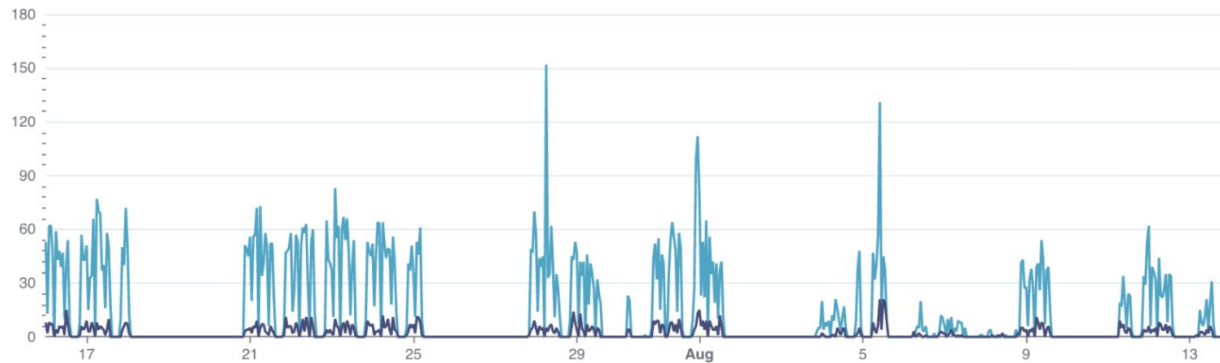
45



Detections by the Hour

1

Batteries Flammable Tanks





Customer Story: Rumpke Cincinnati MRF

[Customer Story Video](#)





Pedal Point: X-ray to Detect Hazards on in E-Scrap

Case Study: Pedal Point (E-Scrap)

Status Quo: E-waste scrap processors accept electronics and manually check items for the presence of hazards like batteries, which explode on shredding

After Visia: X-ray modules powered by our AI examine all of Pedal Point's inbound material and automatically alert operators to hazards like batteries

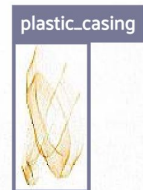
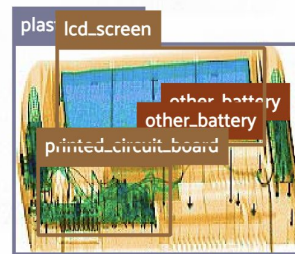
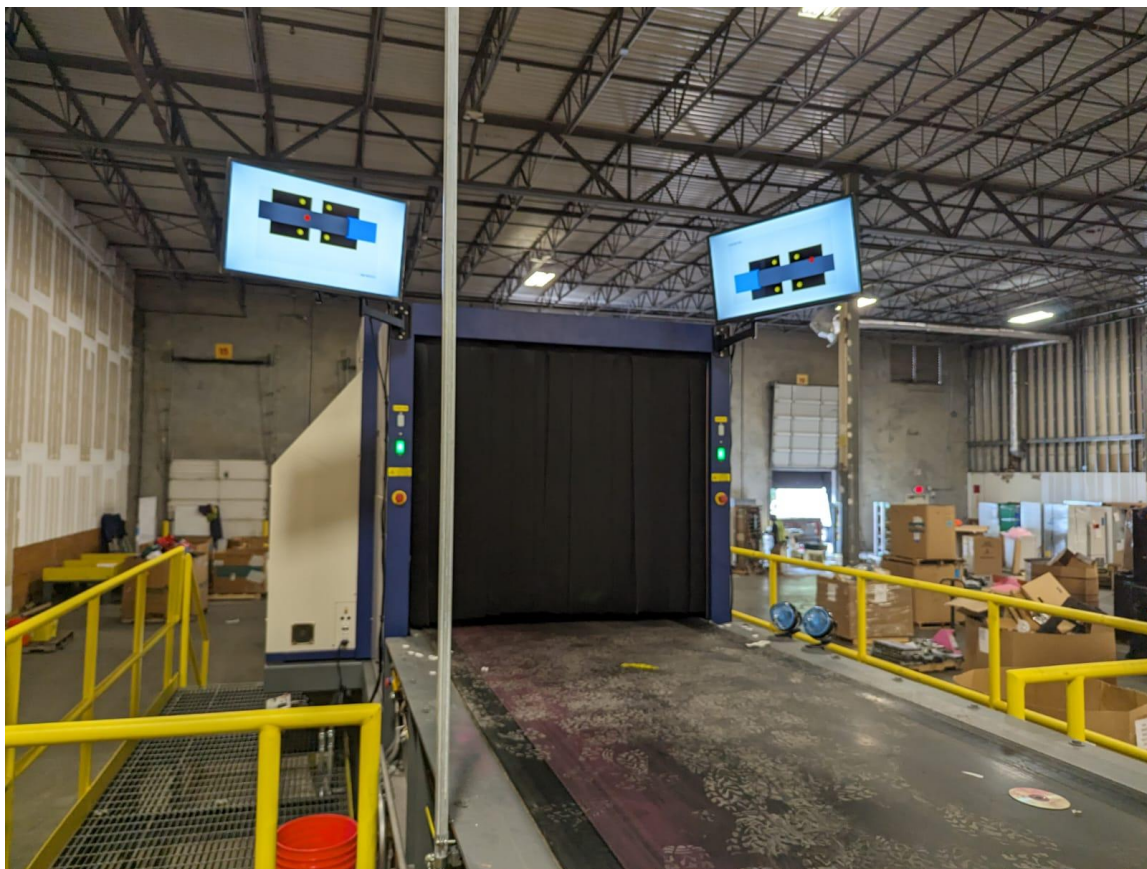
Impact:

- **Zero** thermal events downstream of Visia
- Pedal Point was able to reduce QC staff from **6 → 2**
- Pedal Point processes material at **4x** throughput
- Rolled out **nationwide**



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Customer Story: Pedal Point E-Scrap Facility

[Customer Story Video](#)



AI Brief: Visia X-ray Module Identifying Batteries in E-Scrap



Video URL: <https://go.binit.ai/visia/x-ray/escrap/live>

XRC Cargo X-Ray



The Solution: X-Ray powered Material Intelligence

- **Real-time** inbound material intelligence, **in-vehicle** at the scale
 - Identify **hazards** like batteries, propane tanks
 - Item composition intelligence (Ferrous vs Copper vs Aluminum vs Dirt)
- **95%+** accurate AI performance, regularly audited in combination with the Visia team
- **Field-tested** equipment

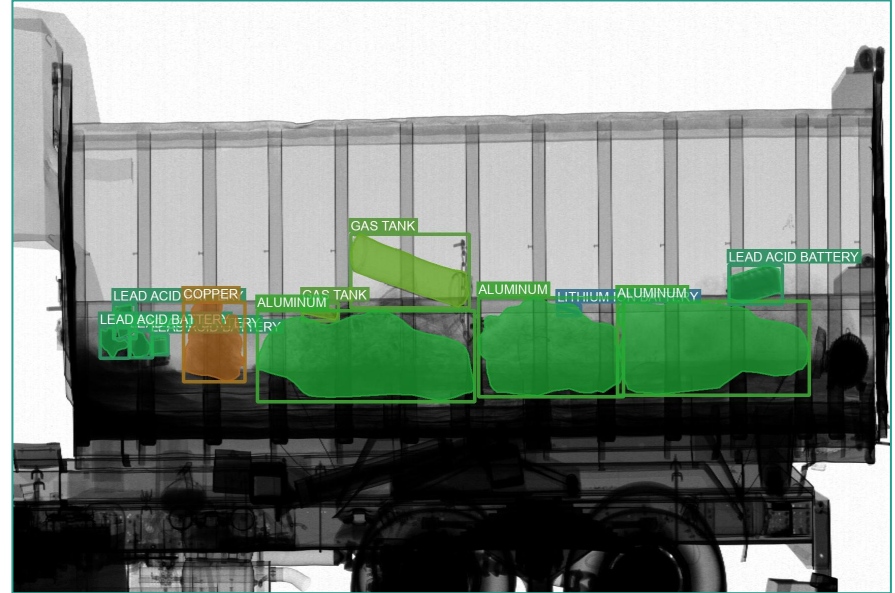


Hardware Brief: System Setup & Operating Constraints

- Limitations for width and height of incoming trucks:
 - 2.8m (W) / 4.6m (H) | 9.19 (W) /
 - 15.1ft (H) / Length: Unlimited
- Power supply: 80Vac +/- 10%, three-phase + neutral + ground, 50/60Hz +/- 3Hz
- Power: 30kVA
- System can be configured to avoid interference with radiation detection

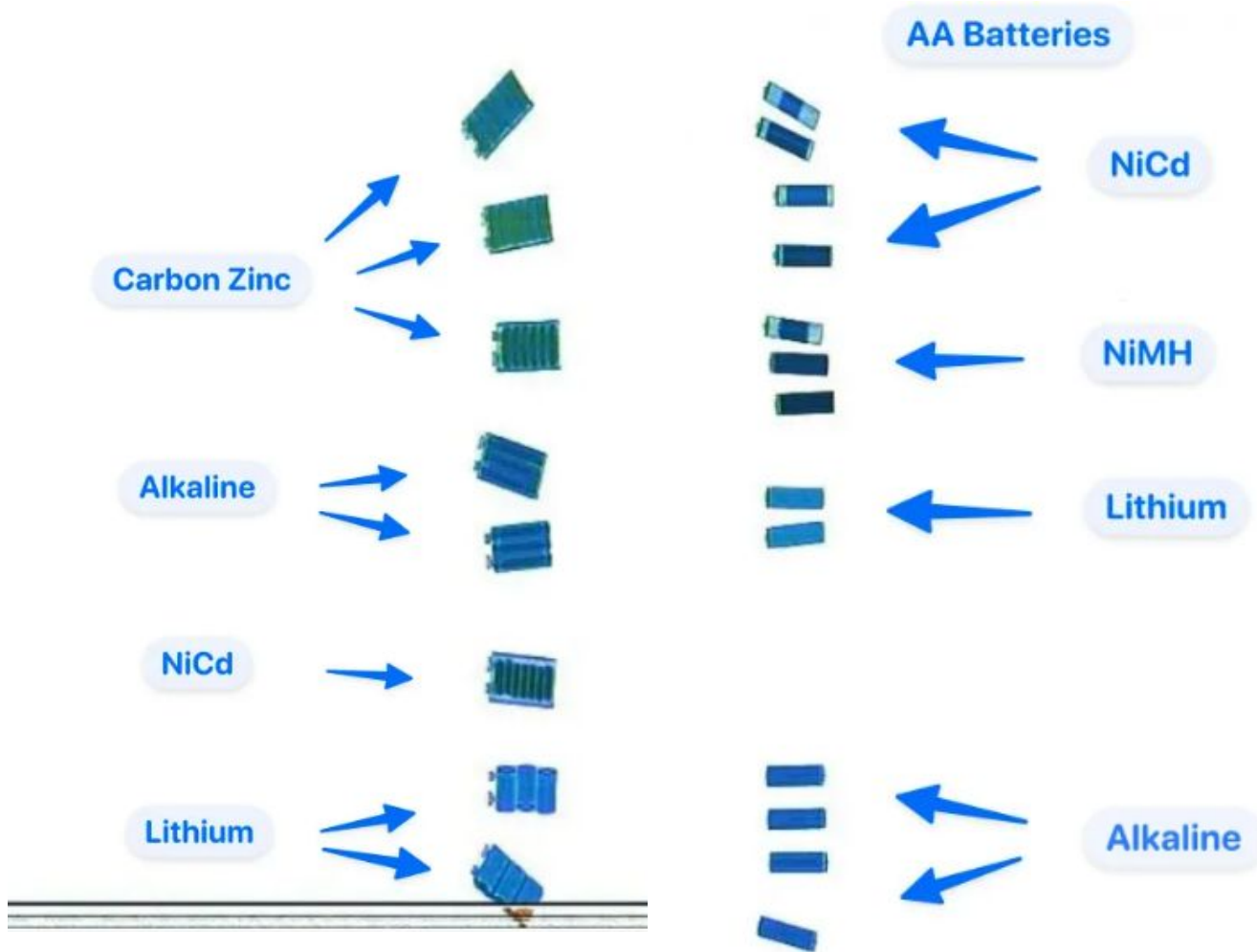


The Solution: X-Ray powered Material Intelligence



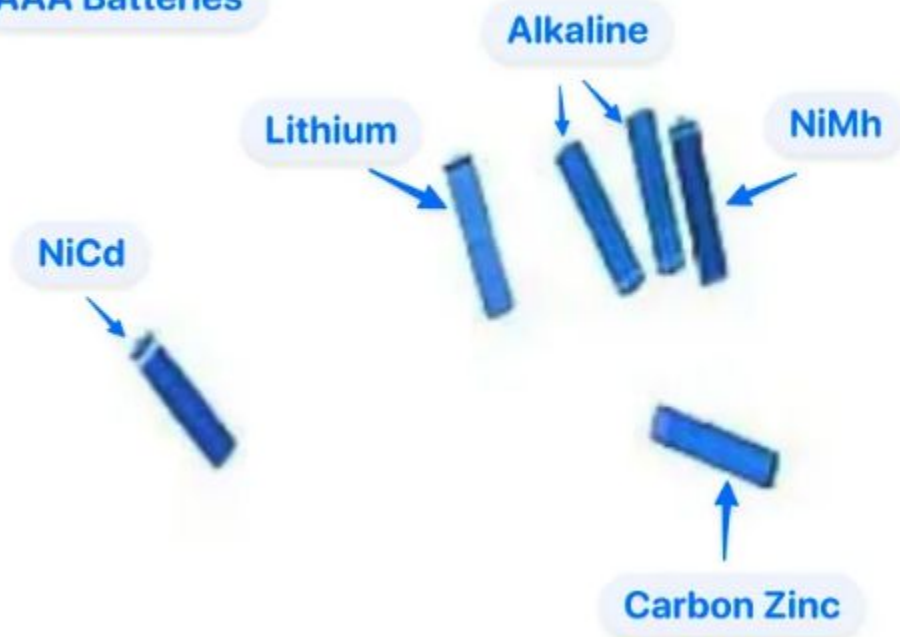
Sub-second hazard detection **at the scale**

Battery Chemistry Distinction



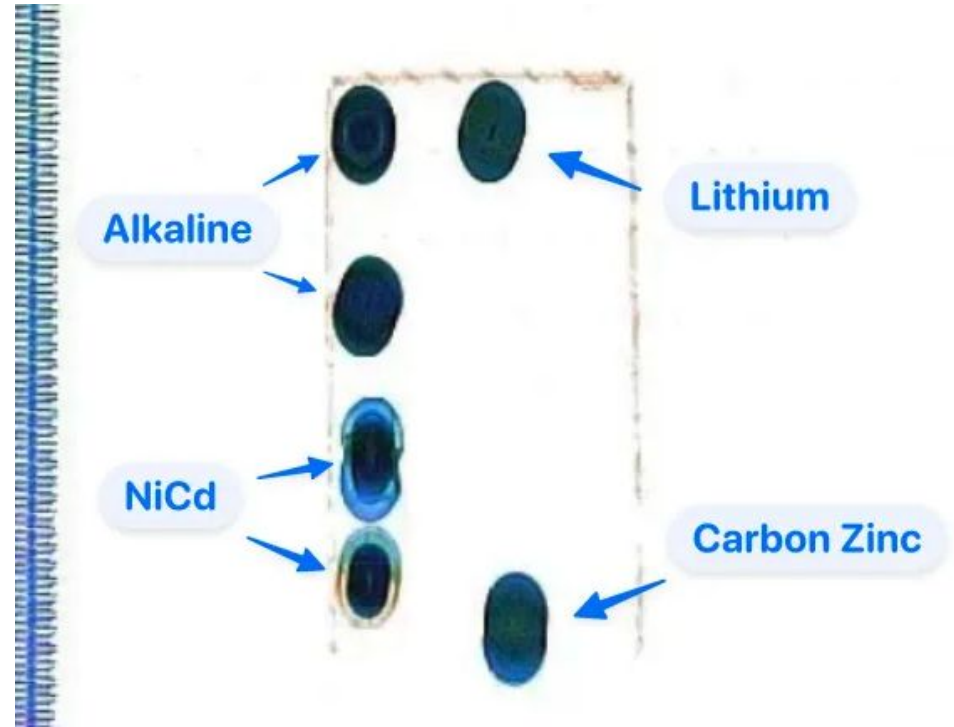
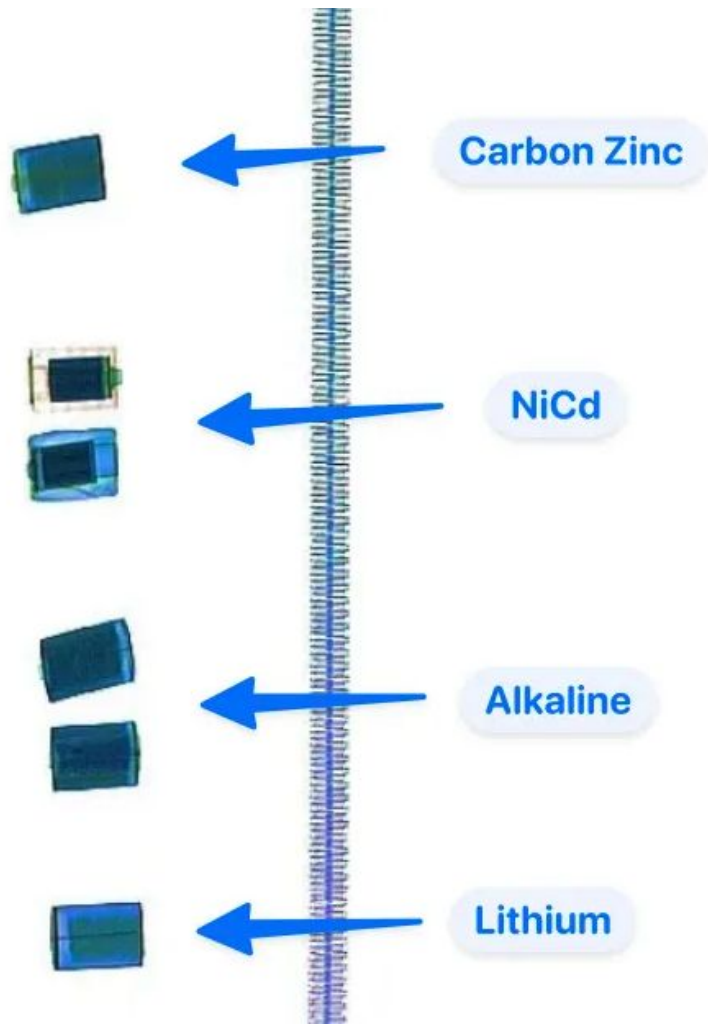


AAA Batteries



Button Cells





Hazard Alerting

AI Cameras: Hazard Detection in Trucks



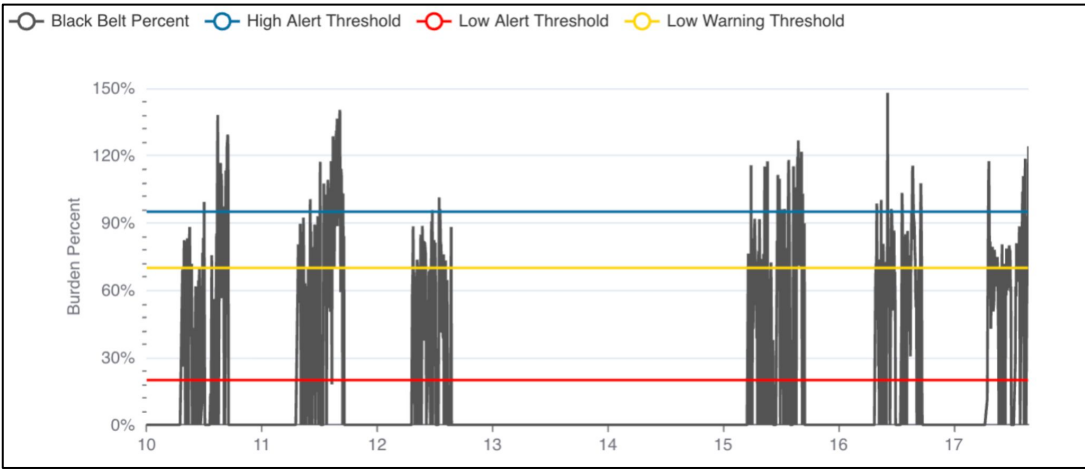
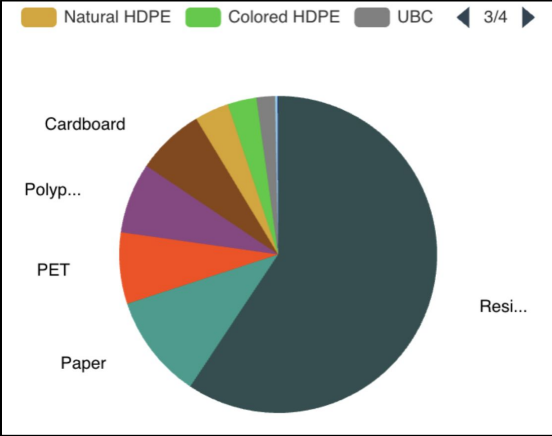
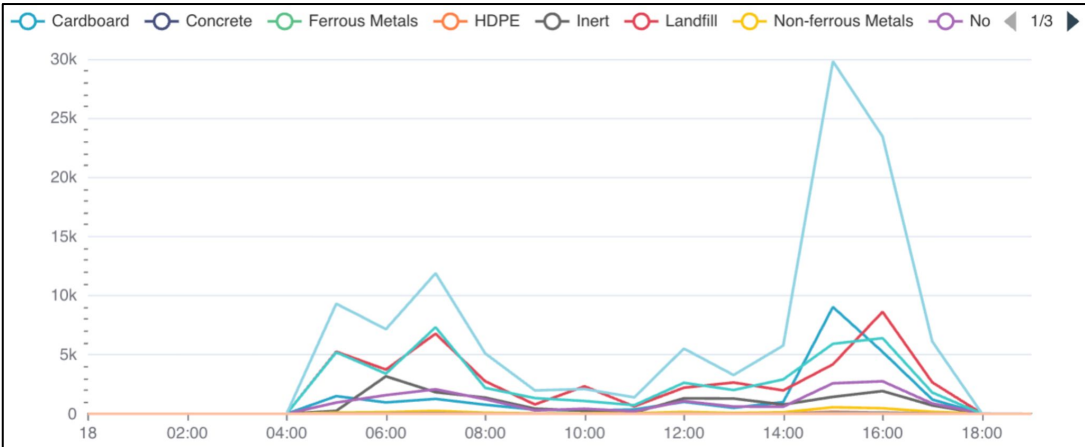
AI Cameras: Hazard Detection on Tip Floors



AI Cameras: Composition Analysis and Auditing



Real-Time Material Analytics + Insights



Thank you!

Appendix

Specs

XRT-01 Conveyor X-Ray

Machine Specs + Requirements

Power and Connection Requirements

- Two separate 120 Volt drops at 15 amps each
- One ethernet drop (hard wire, CAT 6 or better)
- E-stop and run conveyor signal Interlock cables to customer system control (will vary based on existing set-up)

Space Requirements

As a rule of thumb, we need 12-16' of free belt space to install a unit (16 is ideal, 12 is absolute minimum). We can only install over a rubber belt conveyor (no steel pan belt, no chain roller belt) The unit is ~10' wide. A smaller unit (8') is also available for tighter spaces.

Our systems can be installed on an incline as well. We have worked with a wide variety of tight and complicated facility requirements. For specific set up questions, please ask your Visia Sales Engineer.

Radiation Safety

All of our machines are certified with the local governing safety body upon installation. We follow all legal requirements for signage and training. Our machine certifications are renewed in accordance with local law.

Weight

The machine's total weight is roughly ~ 3,900 lbs. The main arch is ~ 2,400 lbs. The shielding and control rack is another ~1,500 lbs. The heaviest individual piece of the machine with shielding weighs 850 lbs.

Hardware Brief: VMI Security

- VMI Security is one of the world's biggest manufacturers of x-ray technology, with over 30+ years of operations, 5000+ employees, and offices in the US, Australia, and Brazil
 - VMI Security has deployed & supported over 500 Spectrum Cargo units at ports & customs crossing across the world
 - VMI has **99+%** uptime across their existing cargo scanner deployments worldwide
 - VMI would work with Visia to service Spectrum Cargo units at Visia's SLAs (**24h** response time, **48h** to on-site)
- Visia has deployed at close to **30 customer sites this year with VMI Security as our primary x-ray vendor**. We are confident in VMI's support processes & our ability to interface with VMI to provide a smooth commissioning

Hardware Brief: System Setup & Operating Constraints

- VMI's Spectrum Cargo requires **80 ft x 80 ft** of room to be installed in a manner that is efficient & safe for use
 - Inspection zone must be condoned off via fence
 - Inspection zone can be reduced to **80 ft x 15 ft** via adding a concrete wall; confirmed during pre-eng
- Rated to have vehicles drive through at ~6-10 mph
- An example video can be found [here](#)

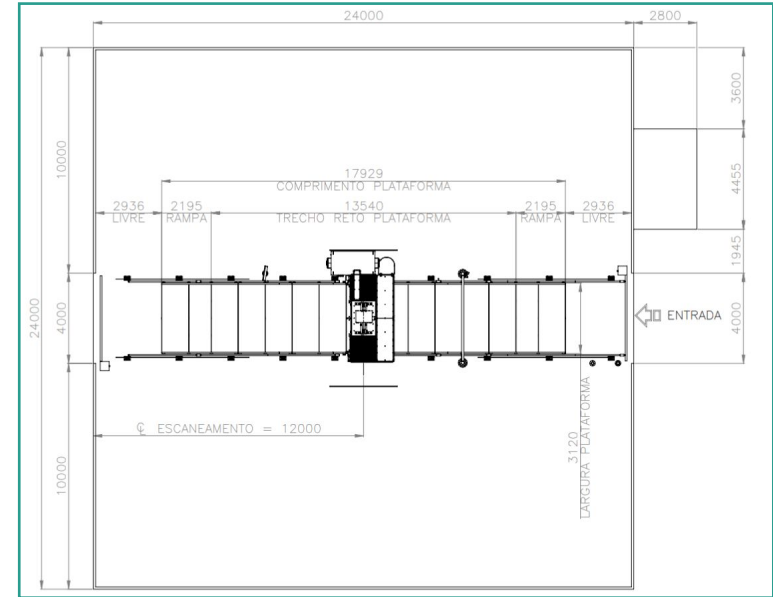


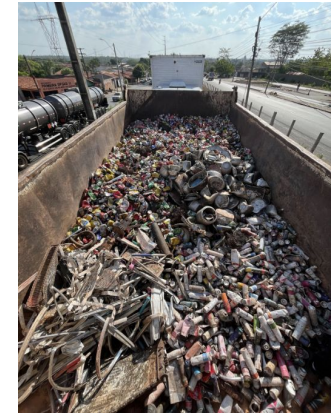
Diagram units in mm

Cargo Field Evaluation Procedure



Visia Cargo Field Evaluation Procedure

- Prior to implementing a cargo x-ray, we require all customers to conduct a field test in Teresina, Brazil (selected because of the location of the Cargo X-Ray within the field and the ease of testing a diversity of material)
- Visia “spikes” hazard-free loads with known hazards to analyze detection accuracy
- This allows Visia to test the site material under real world conditions to analyze feasibility and evaluate detection accuracy for various hazards
- Average test takes ~ 3 days during which we evaluate 3-4 types of loads. Preparation depends on the type of trucks and base material needed
- Additional tests can be run as requested
- Upon test completion, Visia to provide results on recall and precision metrics per hazard type



Client Cargo Field Evaluation



Overview

Visia's tests are conducted in a real-world setting in collaboration with VMI Security, a Visia OEM partner and one of the largest manufacturers of X-ray equipment in the world. All material used for testing will be procured from a recycled metal processing yard locally in Brazil.

Scope

- 3-4 days, depending on the number of hazards and the types of trucks and base material needed
- Minimum of 2 scans each of 3 - 5 different individual items per hazard type

Requirements

- Client to provide average base material composition data so Visia can simulate the loads of material on-site at the testing facility in Brazil
- Client to provide detailed list of hazards that they aim to have identified by the Visia platform (e.g. Lithium-ion batteries, Ni-Cd batteries, handheld disposable vapes, metal > 30 cm, etc.)
- Client to provide photographs of hazards so that Visia can replicate on-site at the testing facility in Brazil

Optional

- Client to attend all testing procedures with Visia team in-person at testing location in Brazil



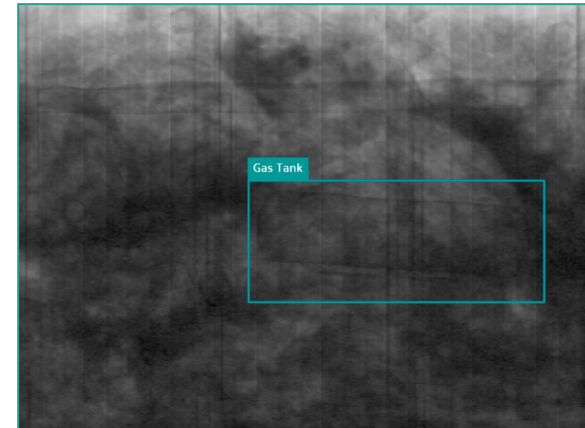
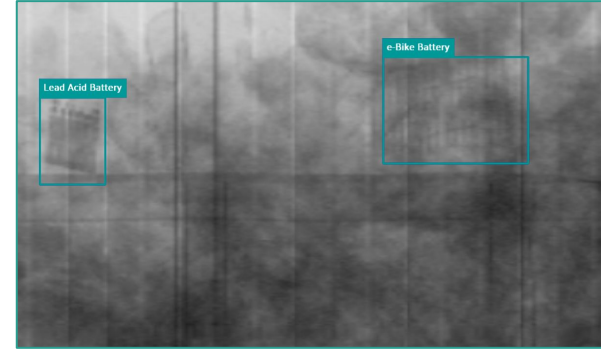
Visia Test Results

Following the test, Visia will produce a written report for Client detailing the expected **precision** and **recall** per hazard.

The intent of this report is to clarify what hazards are consistently recognizable underneath the X-Ray and under what conditions.

Precision: The ratio of hazards correctly detected divided by number of hazards present and number of false positives. Low precision is a sign of us **over-alerting** in loads that **might not** have hazards.

Recall: The ratio of hazards correctly detected divided by number of hazards present within material. Low recall is a sign of us **under-alerting** or **missing** loads that **might have hazards** present within them.



Example Test Results

Detailed Evaluation: Transfer Trailer and Rolloff Truck for MSW Client

Material Group	Hazardous Item(s)	Notes
Fully Recognizable	• E-bike battery • UPS (Pb-Acid) battery • Gas tank • Metal object (~$\frac{1}{4}$" thick, 2 sqft) • Steel cable ($\frac{3}{8}$" thick x 10ft) • Steel drum (55 gallon), • Steel pipes (1.5" diameter x 4 ft) • Steel chain ($\frac{3}{8}$" x 10 ft) • Rebar (4x4 ft) • Drill battery	92.5% recall, 75-80% precision
Unreliably Recognizable	• Porcelain (~$\frac{1}{4}$" thick, 1.5 sqft) • Concrete (1 cu ft)	Items are visible with Visia between for less than 100% of runs but are occasionally visible based on position