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Video analytics solutions

2010
People counter

2013
LPR

2015 - 2016
Parking and tool station modules for LPR
Observer Radar
R/G LED display

2017
QR and Container Code recognition

2018
Parking Place Detector - PPD

Deep neural networks

2019
Unified web UI and RGB displays

2020
LPR: Vehicle classification
Area Counter + industrial module
Thermal Analyzer
MultiController

2021
Line Counter
MarineX boat recognition and measuring solution

2022 - 2024
Broad range of custom applications
Robot arms integration
Aerial & terrestrial drones

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14 years of video analytics innovations

3500+ licenses sold in Romania, Hungary, Croatia, Slovenija, Israel, Bulgaria, Germany, Belgium, Serbia, Denmark, Norway, Belarus, Lithuania, Saudi Arabia, Kuwait, Bahrain, Qatar, Tanzania, Argentina and more ...

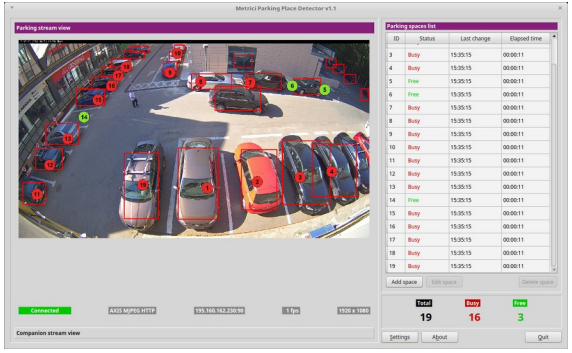
2018: New multipurpose recognition engine

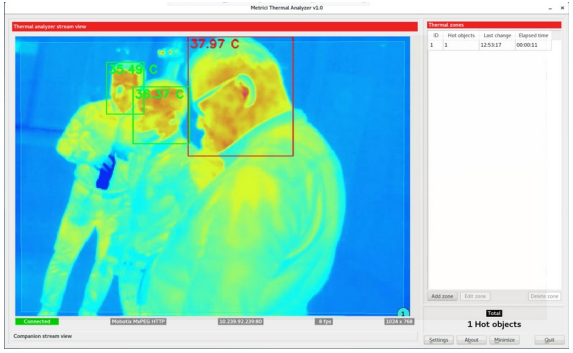
Based on Deep Neural Networks technology (AI)

More accurate than traditional segmentation technologies

Can be trained to recognized almost anything, from backpacks, to people, bicycles, cars, trucks, planes, trains and so on

Used by: LPR, PPD, Area counter, Thermal Analyzer, Line counter, Custom Applications





Recognition engines

License Plate Recognition (LPR)

Parking Place Detector (PPD)

Area Counter (AC)

Line Counter (LC)

Thermal Analyzer (TA)

QR Code Reader

Container Code Recognition

ID Card Reader

Snapshot

Web UI + DB

Web interface with a relational SQL database behind

Has several modules which can be licensed separately

Contains history of events, reports and alarms for each type of application

Users can have restricted access rights based on location or menus of the interface

Hardware

Recognition server (x86)

Metrici Multicontroller

+ Wiegand interface

+ RFID reader

+ red/green LEDs

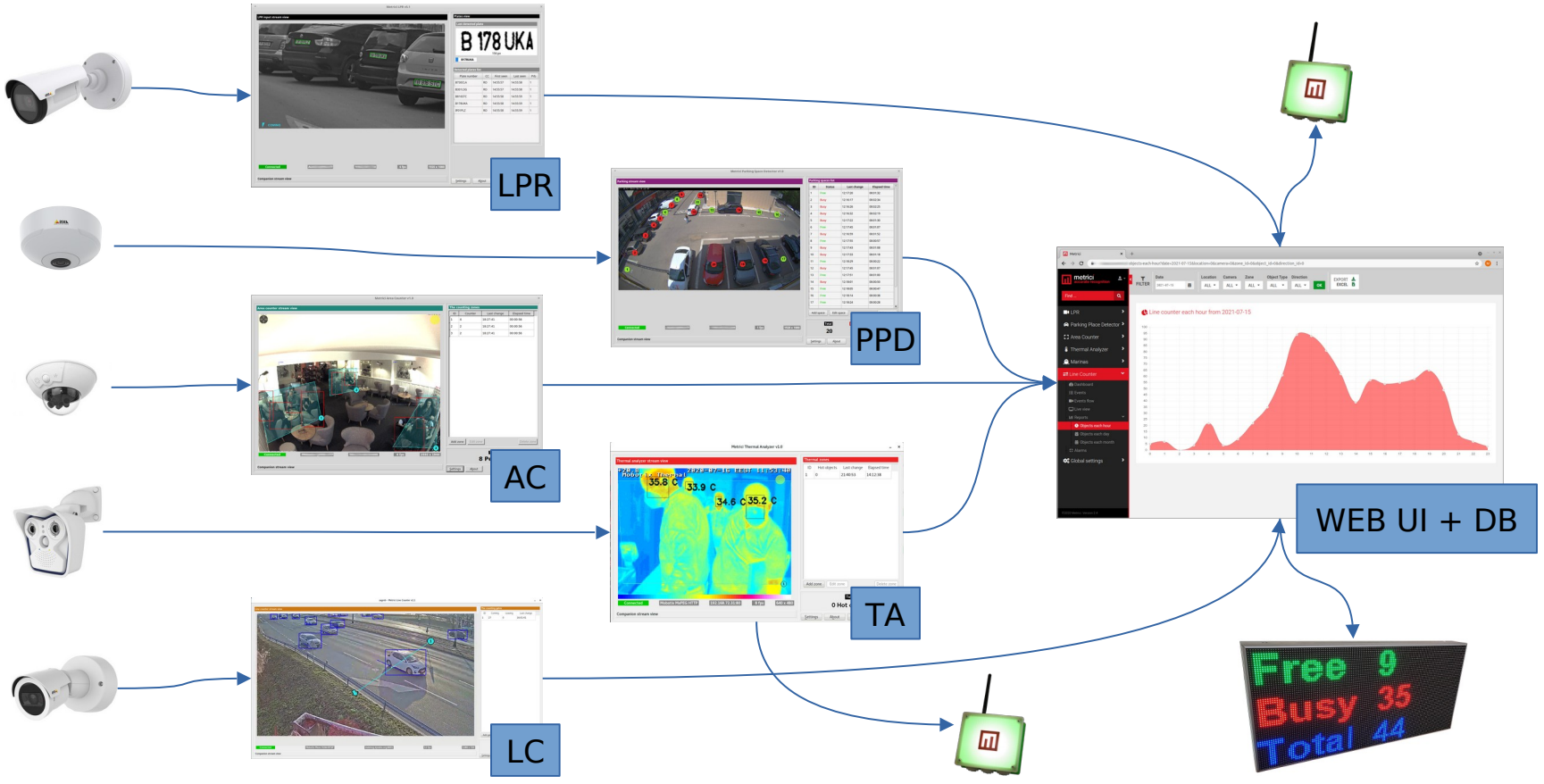
+ 110dB speaker

Metrici Traffic Light PoE

Metrici Observer Radar

Metrici RGB Displays

Barix Barionet 50


LPR
PPD
AC
TA
LC
WEB UI + DB
Free 9
Busy 35
Total 44

Standalone server	Several recognition servers, one having the WEB UI	Several recognition servers, the WEB UI in the cloud
Appropriate for small installations or when there is no Internet connection	Appropriate for medium and large installations where the information could be kept out of the Internet	Appropriate for very large installations where the locations are spread all over the world
	Unlimited number of servers can be linked together	Unlimited number of locations/ servers can be linked together
		The WEB UI can resides on a HA/LB cluster
Provides the best latency	The most cost effective	Provides the best flexibility and redundancy

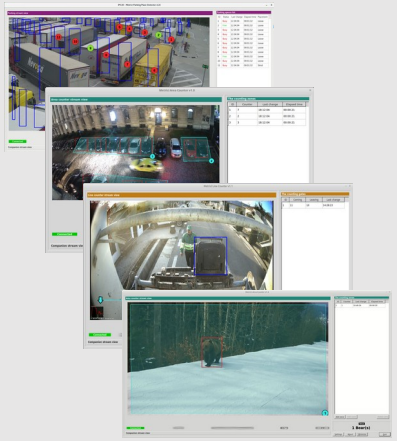
Smart city

Parking management

Garbage collection

Traffic management

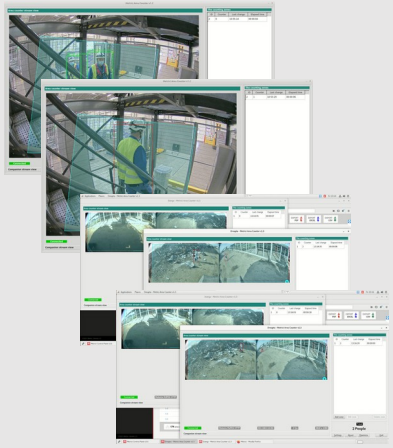
Bear recognition



Safety & protection

Helmet, harness and vest recognition

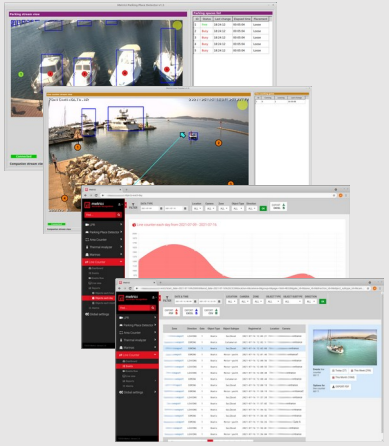
People detection around scrap handlers



Marina management

Boat type recognition and length measuring

Management of the available berths



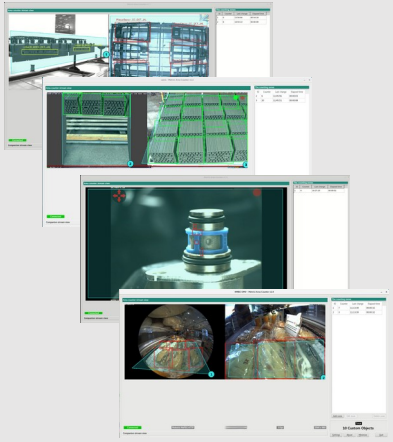
Advanced VA

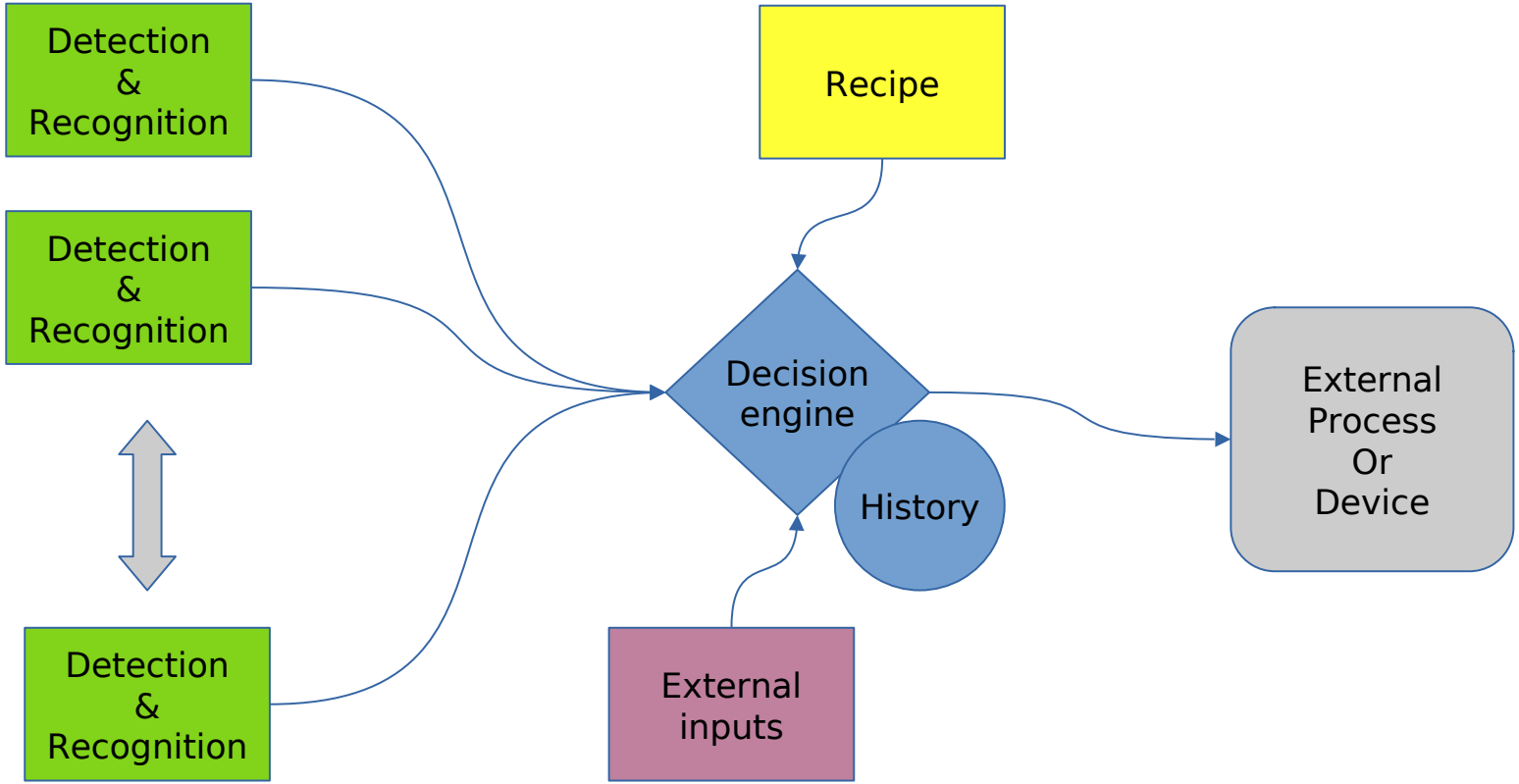
Automotive industry

Bricks production

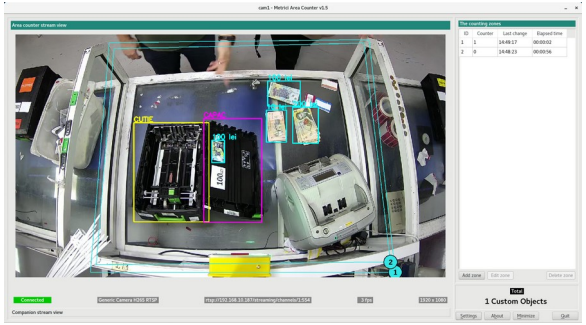
Fuel filter inspection

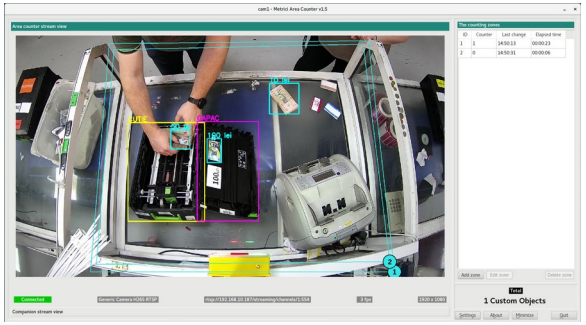
Shelf analysis

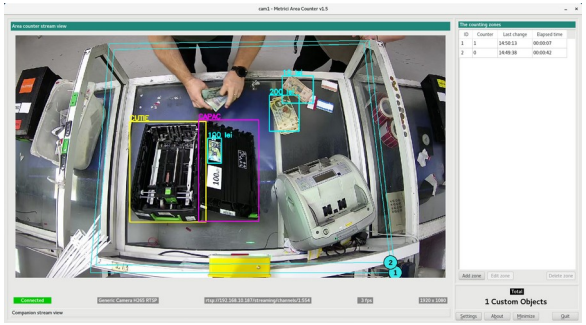




Advanced video analytics – flow chart







* The neural network was trained to recognize the cash cassette, the lid and each denomination.

* When the operator puts a cassette on the desk, the application waits until he opens the lid and verifies if a bill is glued on the lid. If there is no bill on the lid, or there are more than one lid, the application raise an alarm and it will light up the red LED and it will play a sound. If all it's ok, the green LED lights up.

* After receiving the green light, the operator should fill up the cassette. If the application detects a mismatch between the lid bancnote and the ones from inside the cassette, the alarm is raised.

* The current cycle ends when the operator closes the lid and removes the cassette from desk.

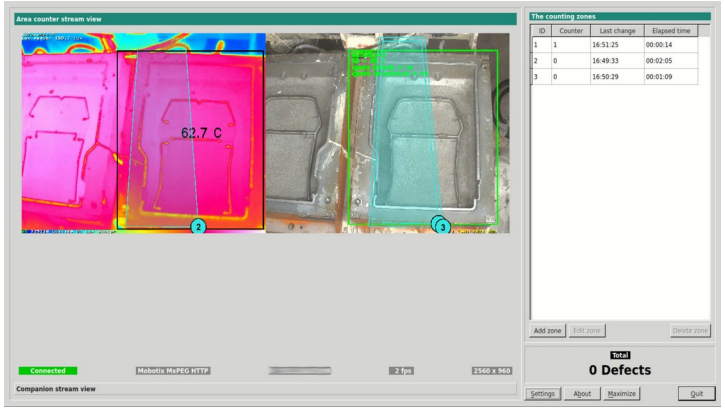
A company in car parts and car seats manufacturing industry needed a solution for quality check of the production.

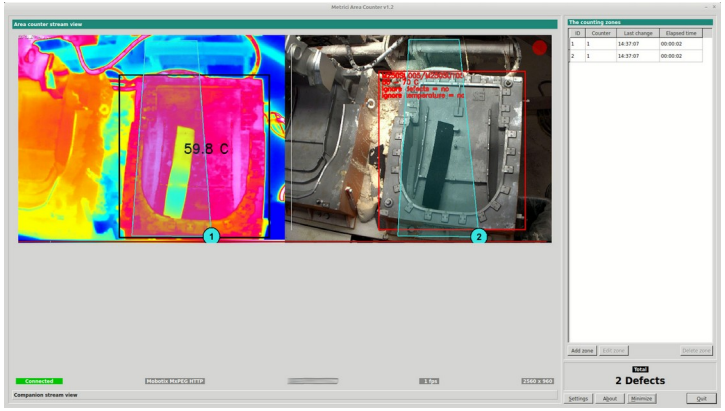
The demand included several requests:

- Automatic check that the molds were properly arranged.
- Also to verify that all molds have all the elements included for the foam to be later injected.
- And last point was to ensure that the molds reached the proper temperature before the final assembly of the seats.

Metrici analyzes several video streams with the production line to ensure all the boxes are checked as they should be, one of which is from a thermal camera. If there is something wrong (e.g. mold not properly aligned, mold without all the elements or if the temperature is not right) an alarm is triggered and the production process is stopped.

Solution used in the first factory was replicated worldwide in another 3 units of the company.





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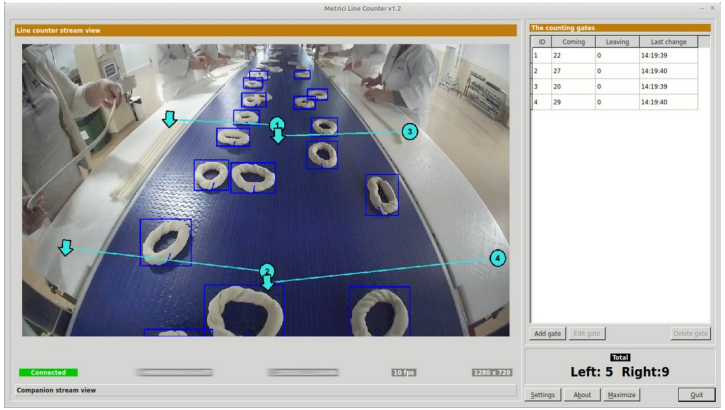
Case study: Car seats factory

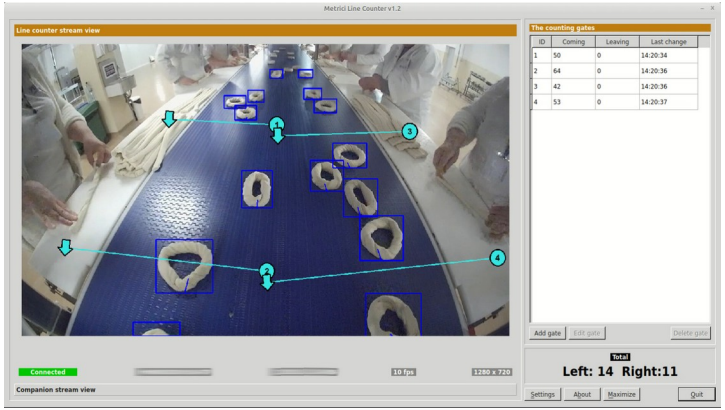
A company activating into the food industry needed a solution for quality check of the production. The production consists of several types of pita, pretzels, pizza doughs and other bakery products. The management team also wanted to have the exact numbers of produced items in each cycle, in order to have a better understanding of production performance.



* Metrici checks 10 conveyor belt lines and it recognizes the kind of product out of 24 classes.

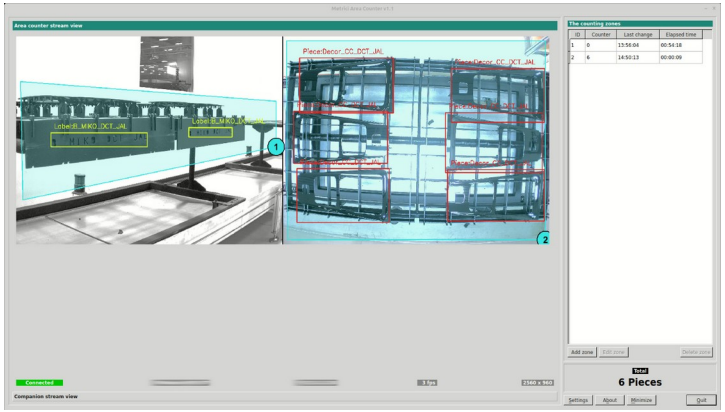
* Using, Line Counter engines it also checks how many products the operators makes in a shift.

* Reports are generated for the total number of products for each shift as well as pieces made on each conveyor belt.



A big OEM company in car parts and car interior elements industry. It produces pieces for several auto companies.

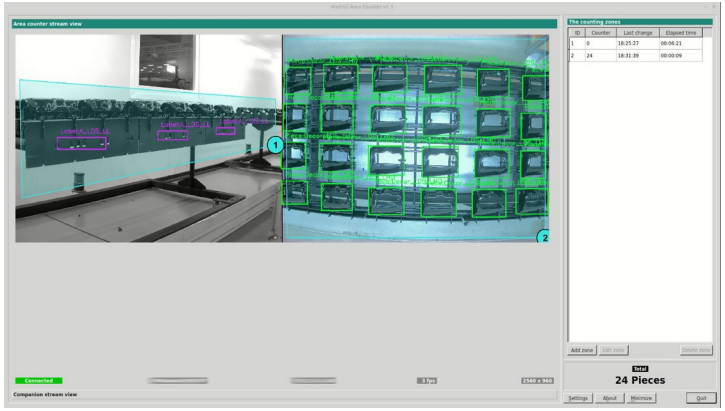
- The factory wanted to make sure that it produces and distributes the right pieces to the right beneficiary
- Also it wanted to count and quality check every piece on the production line
- Each model has its own stand that must be paired with



Metrici checks the pieces and the stands. It makes sure that each stand is paired with the pieces that are supposed to be there.

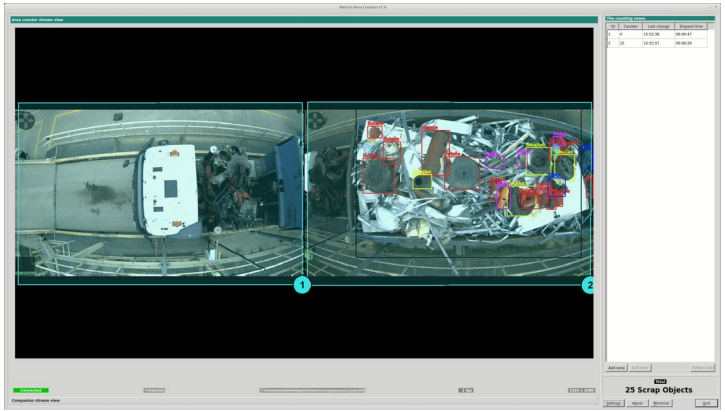
It counts how many pieces there are and it verifies that they are not defective.

If the stands and the pieces do not match or if some pieces are not right, it stops the production process for a human operator to intervene.



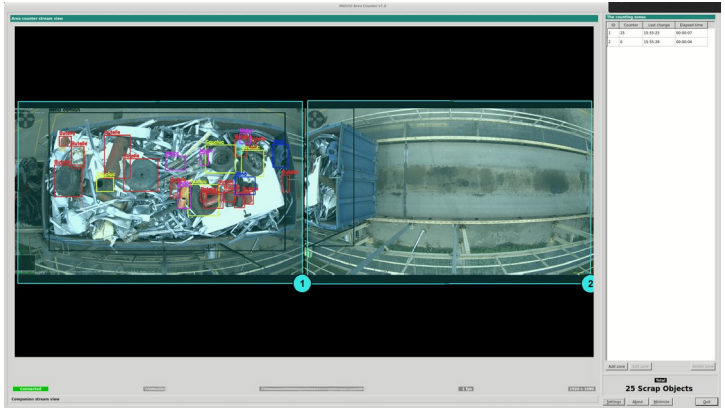
A big steel pipes production company collects scrap metal for internal use.

- The factory wanted to make sure that the metal collected doesn't contain hazardous products and materials, like gas tubes, tires, reservoires, motors, pumps and a few others.
- Also it wanted to have a recording of the payload of each truck which unloads scrap metal.



Metrici checks the cargo of each truck and signals in real time if a prohibited product or material is identified.

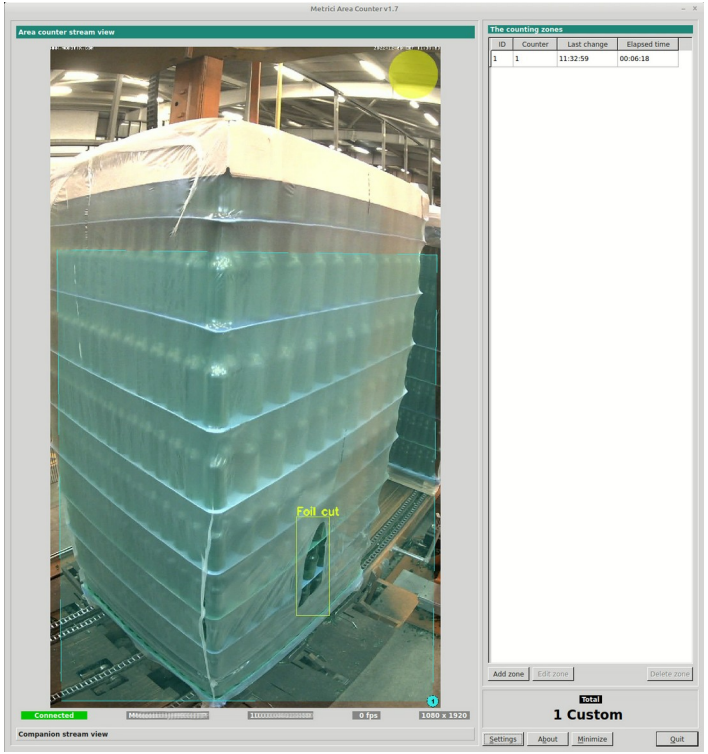
A human operator is required to verify further using high resolution images marked by the Metrici engine and another operator can remove the unwanted product or material, before allowance of the truck inside the unloading area.



A bottle production company needed a solution which prevents the packaged bottles to be sent to clients unproper foiled. The main problems are due to wearing of the foiling machines or due to uneven thickness of the used foil which leads to random cuts. These cuts leaves some bottles unprotected and they can slip away or can be damaged during the transport stages.

Metrici checks each package using 4 cameras placed on all the corners of the package area. When a foil cut is detected, a signal is sent to a PLC device, the line is stopped and a loud sound is emited by a Metrici Multicontroller.

A human operator is required to unwrap the package and refoil it properly. All events are recorded into the database for further inspection.



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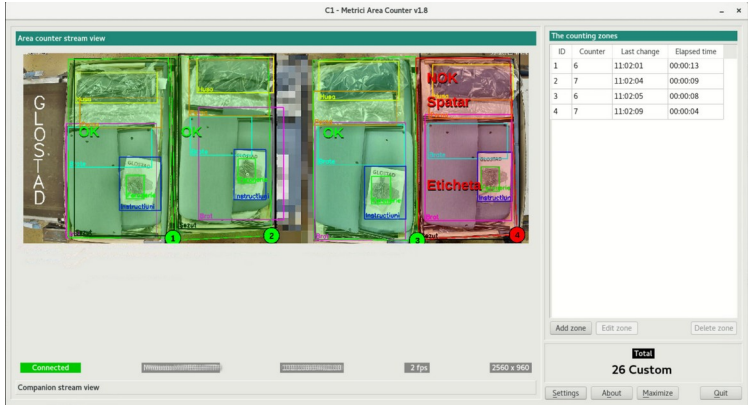
Case study: Bottle production

A big furniture producer wants to check if the human operators which packages the products, have put inside all the items which are parts of each product. Because there are many types of products which leaves the assembly lines sometimes an operator forgets to package all the required items.

Metrici checks each assembly line using 1 camera equipped with two sensors. The packaging area is splitted in 4 assembly zones, each monitored individually. For each product type a recipe is loaded using a fiducial code. If a missing items are detected, an alarm is triggered, showing all the missing parts on a screen.

If an error is detected, intervention of an official is required. All events are recorded into the database for further inspection.



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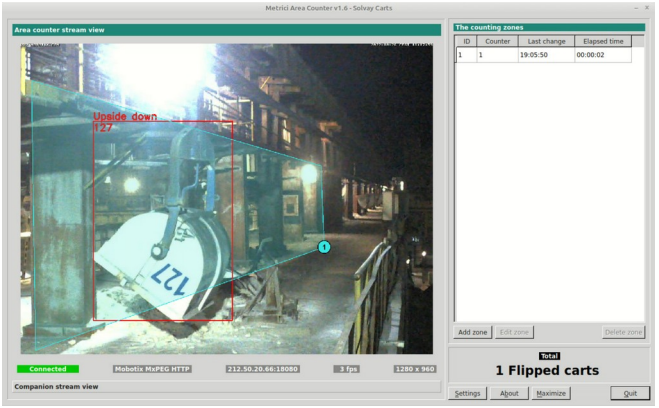
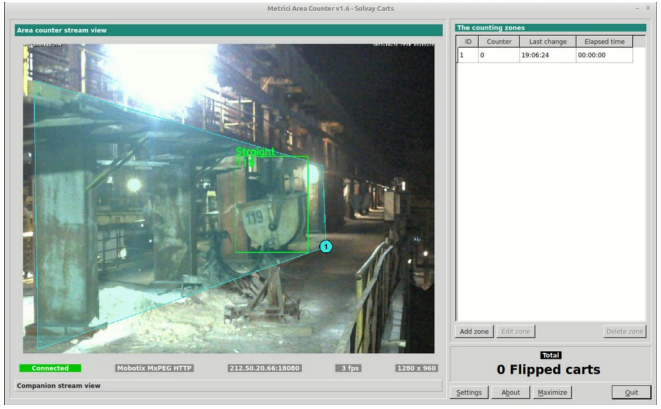
Case study: Furniture production

A global chemical company which have extraction facilities in eastern Europe, asked Metrici to build a solution for cart flip detection. Each extraction pit uses a lot of special carts for moving huge quantities of materials. The loading of carts is done by mechanical machines fully automatic. From time to time, the mecanism which flips each cart before loading, can have a failure, or the cart can reverse by itself after a few meters, if it's damaged.



Metrici checks the position of each cart after it passes the flipping mechanism. If an upside down cart is detected, Metrici stops the line and triggers a sound alarm.



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Case study: Chemical extraction facility

The same global chemical company which have extraction facilities in eastern Europe, asked Metrici to build a solution for ease the maintenance of its carts. Each cart travels on a wire line, holding it through a fork equipped with 4 wheels, running on bearings. The bearings are inspected from time to time by the maintenance personel, but sometimes they become damaged before schedule. This can lead to big losses, because a stopped cart on the middle of the wire line its very expensive to be unmounted.

Metrici recognizes the bearings and measures the temperature of each one, together with the OCR of the cart number.

The algorithm uses a black body for reference and mediates the values in a way that is imune of weather changes. All read values are saved into a database for further inspection.

A service company operating in waste disposal. The service provider has contracts with both individuals as well as companies

Demands for the first stage:

- recognizing two types of trash bins
- recognizing other trash besides bins: bags, boxes, electronics etc

Client also wanted to make sure their staff are not collecting trash that is not allowed or above the quota.

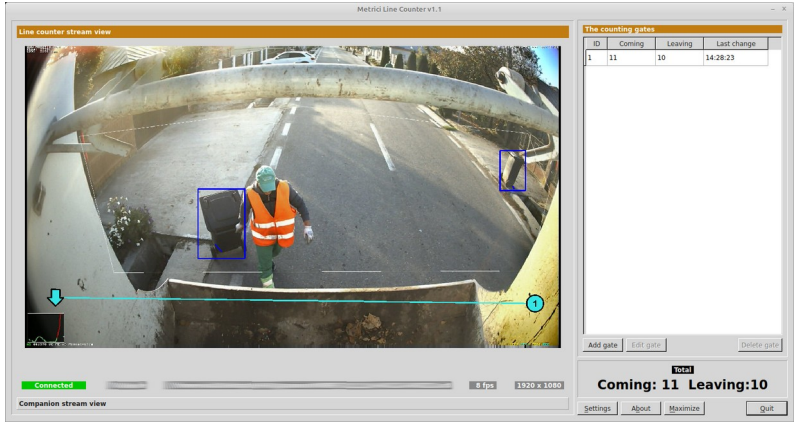
Metrici detects what type of trash is loaded onto the truck

It also reads the GPS coordinates for each event

Counts how many bins are collected and where

All data are a tool to generate according bills to the customers

On a second stage, selective trash disposal is to be introduced and Metrici will make sure the right bins or bags are loaded.



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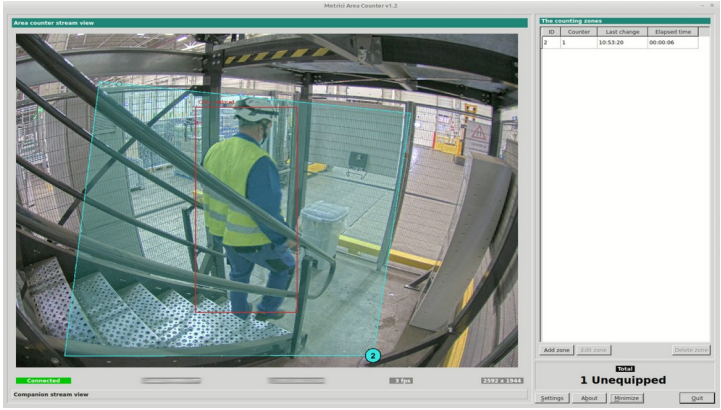
Case study: Waste disposal services

An operator in soft drinks industry, production and distribution center. Most of the processes inside the factory are machine based. Once in a while, when the robots malfunction, human service teams must intervene and fix the machines. The interventions are made at unusually great heights.

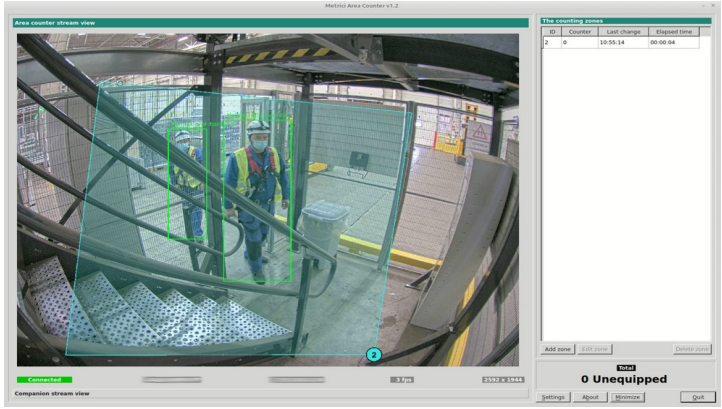
- During time, several accidents occurred on site because the service men did not wear protective gear
- Intervention are made only in an area of the factory and men must enter a certain door



Metrici checks that each person entering the intervention is properly equipped. The men must wear helmet and harness together.

A detection area is set and Metrici monitors that perimeter.

If one protective element is missing, Metrici triggers and alarm for the management team to take measures.



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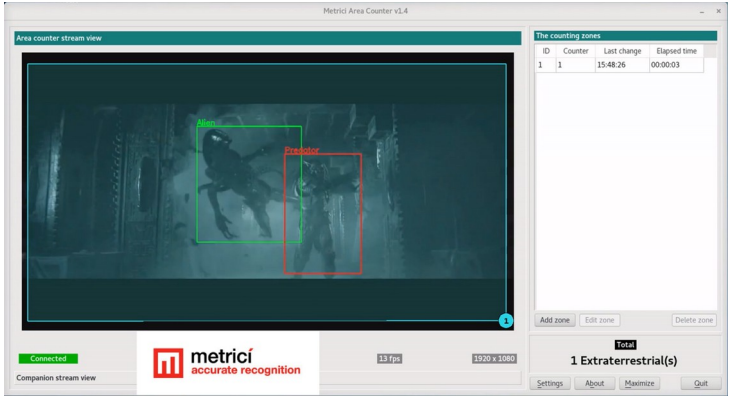
Case study: Soft drinks factory

* The neural network can recognize all the things a human operator can properly distinguish, without going tired, but should be carefully trained;

* The width of the objects which should be recognized must be greater than 4% of image resolution. If the objects are bigger, the “fast” versions of the neural networks can be used with great results;

* A GPU (Intel/ AMD or NVidia) is an advantage, up to 4 GPU/ server can be used for large installations, but an Intel NUC is enough for 1 or 2 cameras;

* The Web UI is not mandatory if the user doesn’t want to store events for further inspection.



Axis	Mobotix	Basler
Native MJPEG support Zipstream	Native MJPEG support MxPEG + thermal metadata Dual sensor	Very high resolutions Speed optimised protocol Lowest latencies

Metrici is fully committed to the protection of the personal data of its users/ customers/ clients, employees, suppliers, and other stakeholders in accordance with the requirements of the law. We take the protection of personal data very seriously, and we have applied various methods and controls accordingly to ensure that we know what data a Metrici system collects, processes and stores, and that those data are protected appropriately.

When a live video stream provided by an IP camera is analysed, no video clips are stored. The live images are analized “on-the-fly” and discarded right after this step. The administrator of the application can choose if the saved data will contain a fully or an obfuscated image of the recognized event (for example the detection of a vehicle) or only the analytic data (like vehicle class, direction of moving, timestamp, etc).

All the data and statistics are stored on local servers, the entire system can work completely offline from the Internet, without human intervention.

Open standards: HTTP API, REST methods, JSON & XML data

Easy integration: each recognition engine (TA, LPR, QR, CCR, PPD, AC, LC) use the same language when talking to other systems

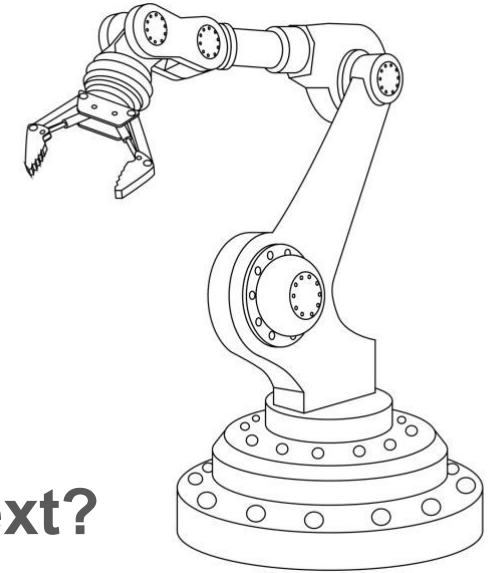
Flexible licensing: you can acquire only the recognition engines, the architecture can be expanded without limits

No additional hidden costs: it works on Linux, so there is no need to buy additional licenses for the OS, the antivirus or the database server

Complete solutions: software, servers and additional devices like LED displays, radar speed detectors, LAN controllers

“On request” customizations: the software can be modified and the recognition engines can be retrained to fit special needs

What’s next?



Thank you

www.metrici.ro