



UNIVERSITÀ
DEGLI STUDI
DI MILANO



Meeting with the students of the 'Artificial Intelligence' degree program

Università degli Studi di Milano

November 3rd, 2025

Speaker



Michele Antolini

**Technical Program Manager
Software Department SEA Vision**

Let's connect
on LinkedIn

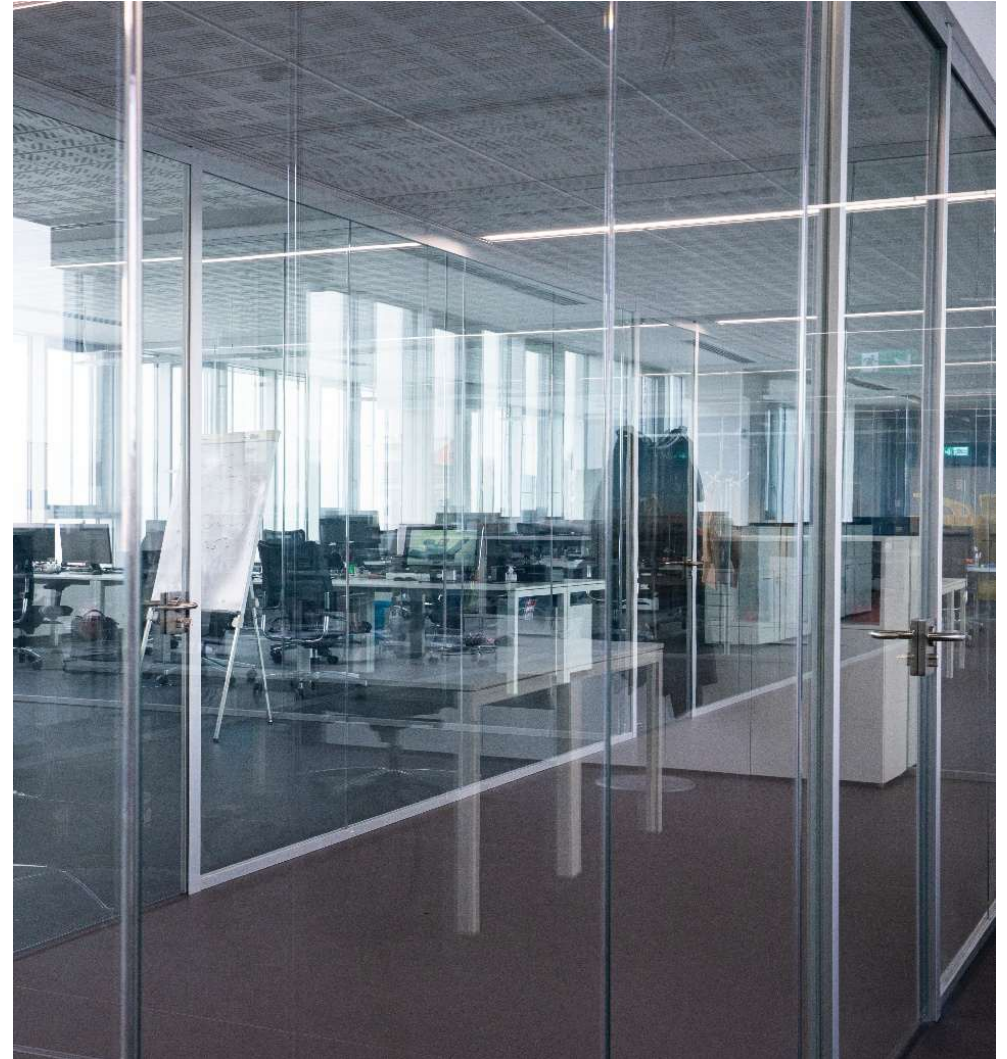


Where is SEA Vision?



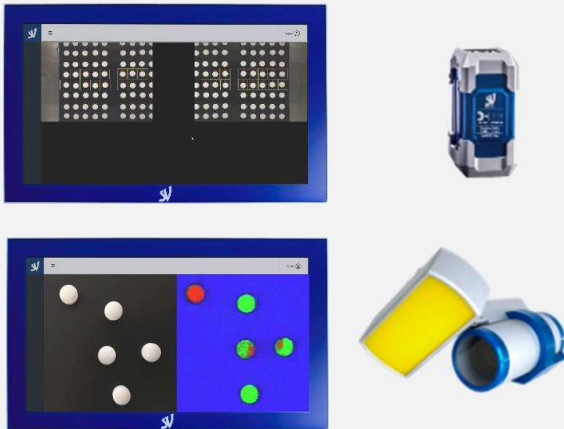
Headquarters: Pavia (PV)
Via Carlo Treves 9

SEA Vision: who we are



Business areas

Vision inspection systems



harleblister_
harletray_

Serialization and Aggregation solutions



tracker_

4.0 Pharma Software Suite



yudoo_

Our Values



BELONGING



DIALOGUE



COURAGE



INNOVATION

Software points of strength and references



30 years of experience
100% Life Science focused



Full in-house software development -
Proprietary Algorithms



In-house electronic and
mechanical design



Full stack solution for Track&Trace
and Brand Protection



Wide Experience and Consultancy for
digitalization processes

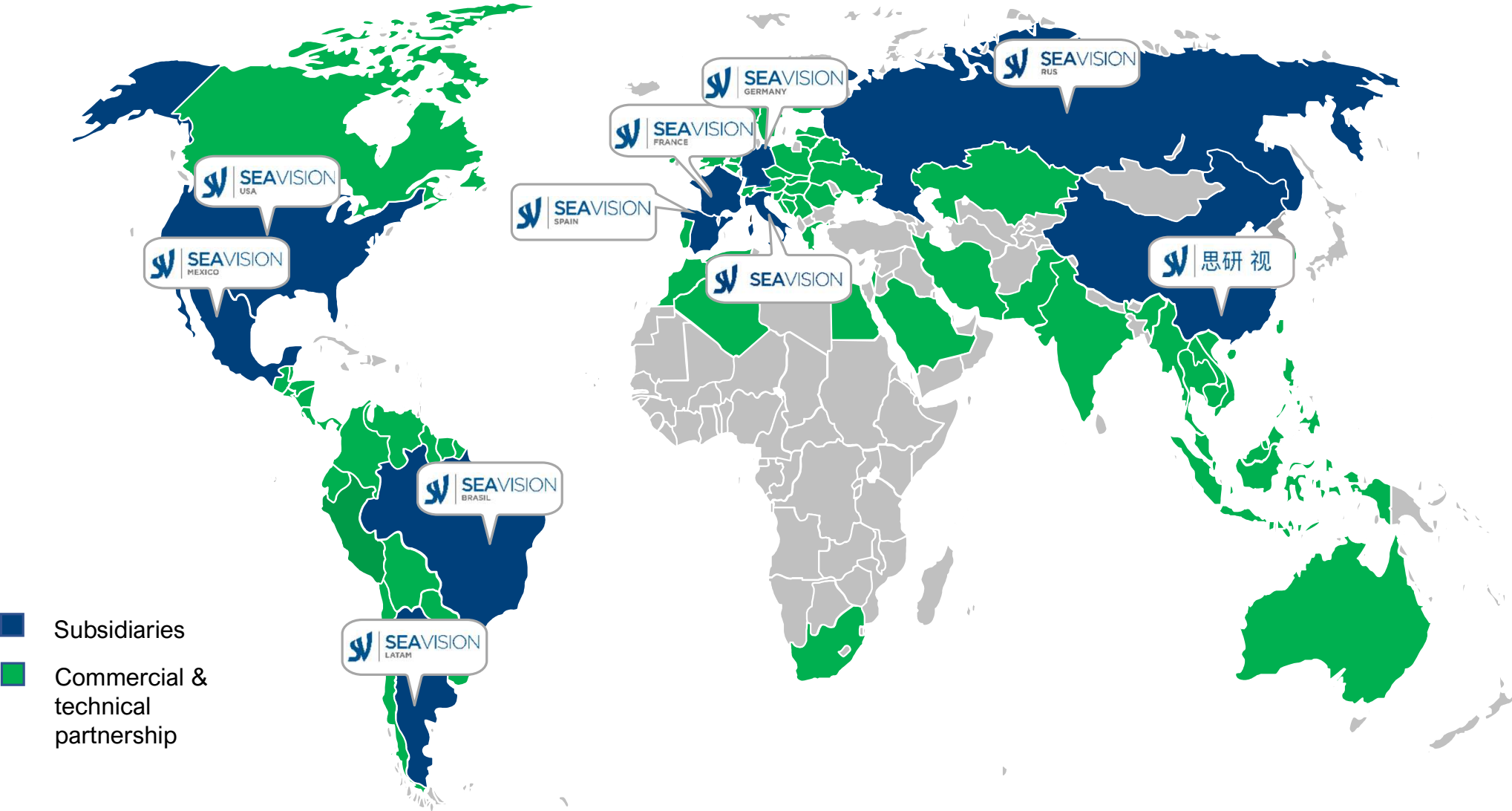
+ 2000

Lines Managed in the
world

+ 8000

Vision systems installed
worldwide
(+18000 cameras)

Where we are

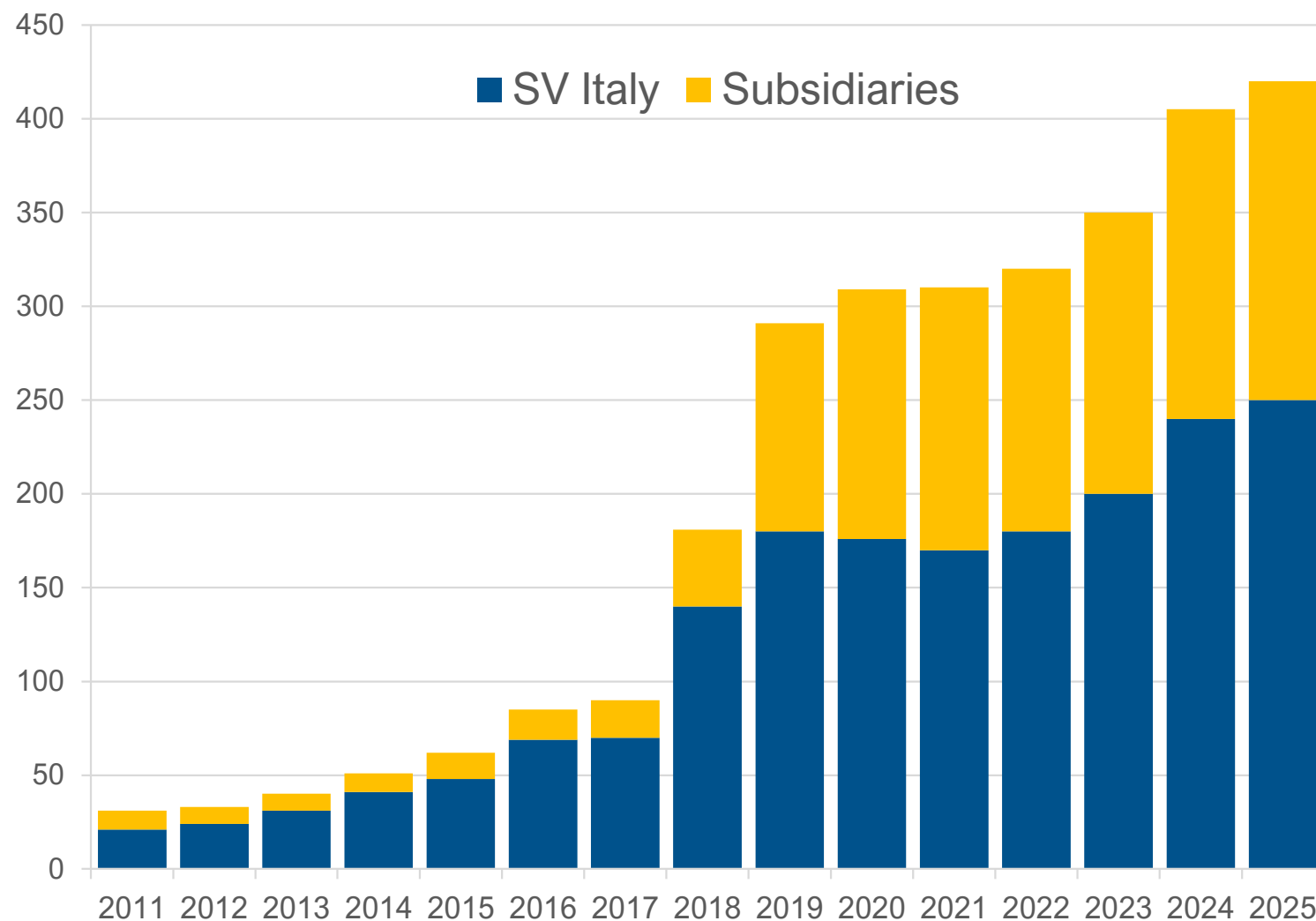


Group Employees

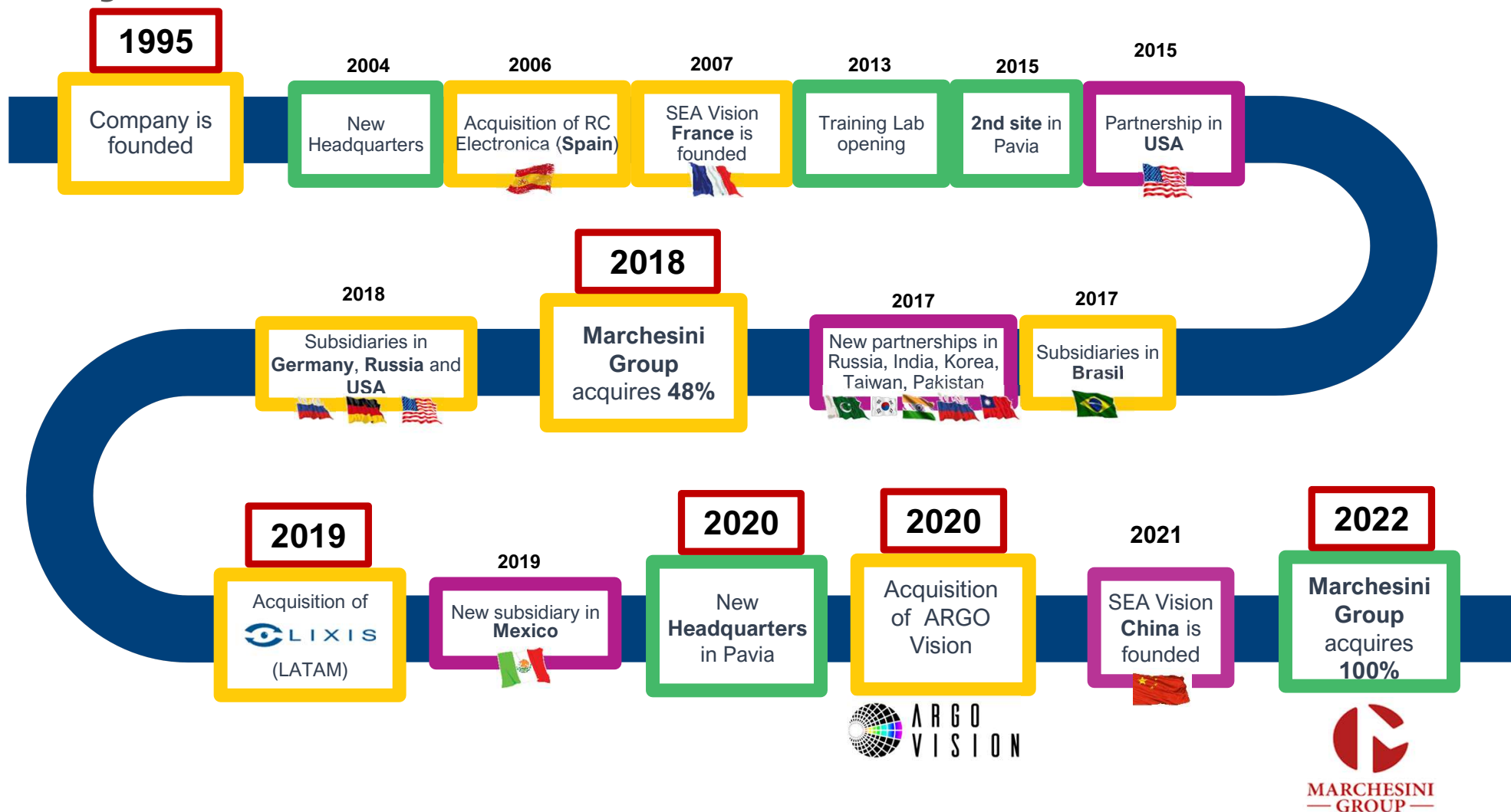
> 400
people
SV Group

> 260
Italy

> 170
Subsidiaries



History





Some of our
Best Pharma
Customers

University and High School Co-operations



UNIVERSITÀ
DEGLI STUDI
DI MILANO



POLITECNICO
MILANO 1863



UNIVERSITÀ
DI PAVIA



**Politecnico
di Torino**



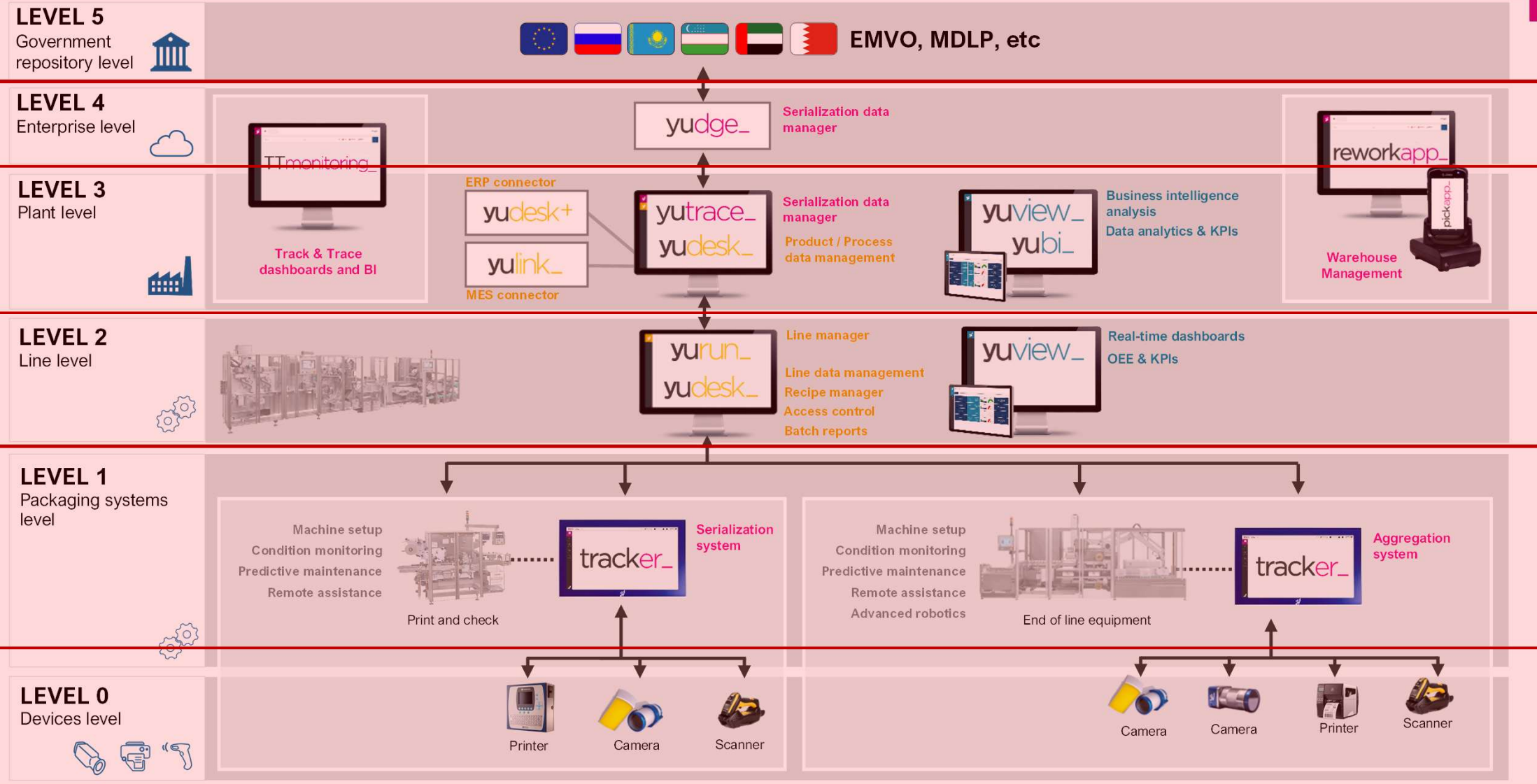
UNIVERSITÀ DEL PIEMONTE ORIENTALE



Serialization and aggregation hierarchy model

(according to ISA 95)

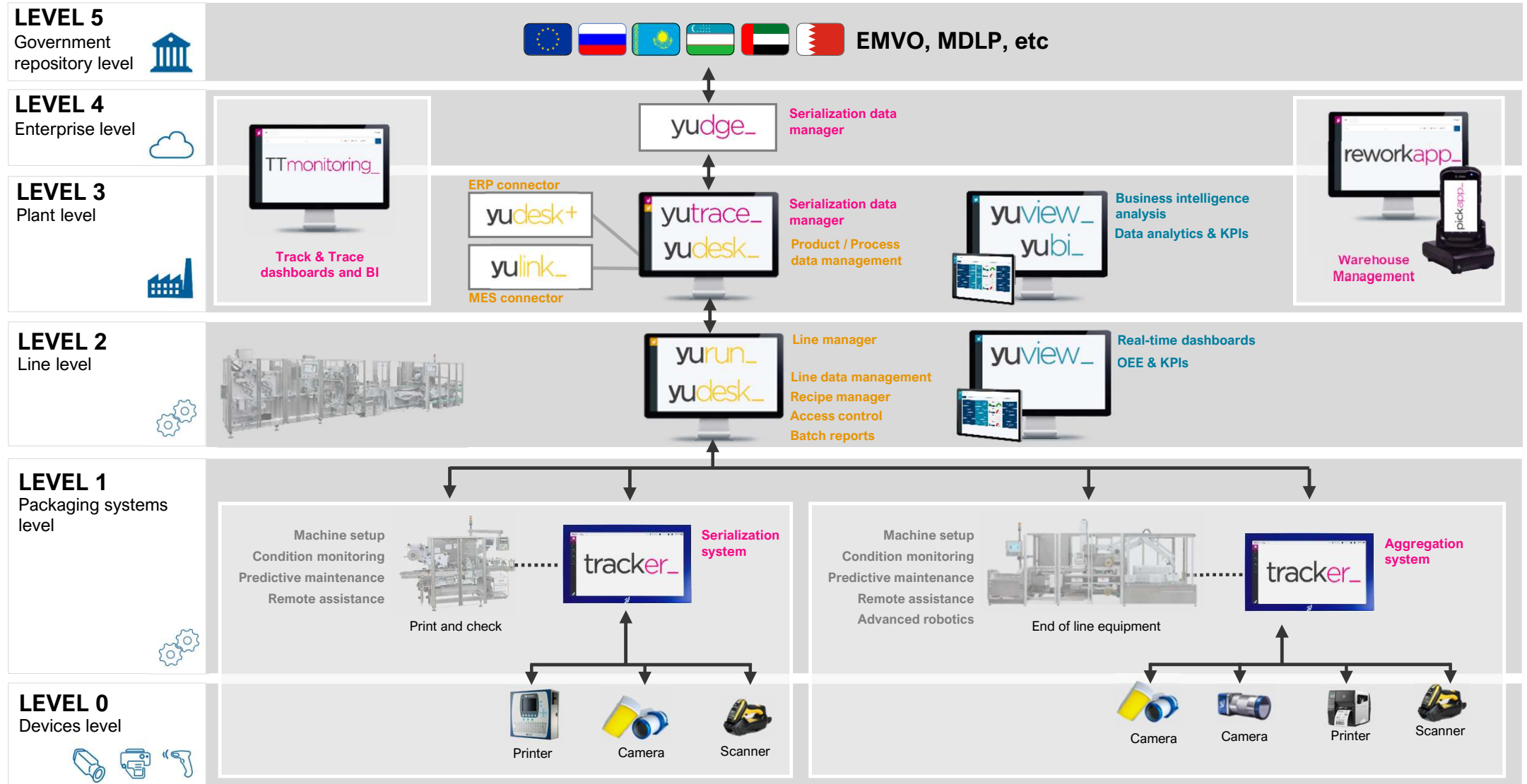
rev.4 2024



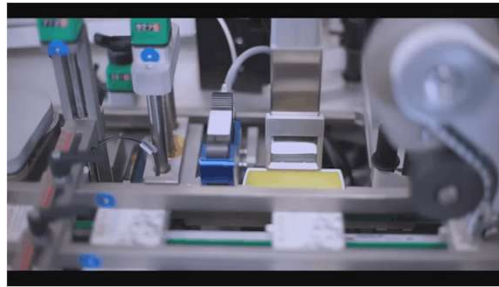
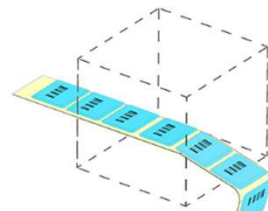
Serialization and aggregation hierarchy model

(according to ISA 95)

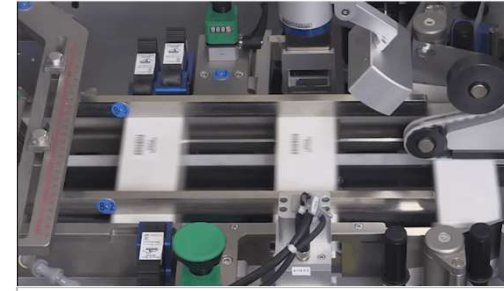
rev.4 2024



Tracker | Serialization possible configuration on print and labelling machine



Camera 3
Check of serialized code and data on carton flap (opposite to the operator side)



Camera 4
Check of vignette on carton top

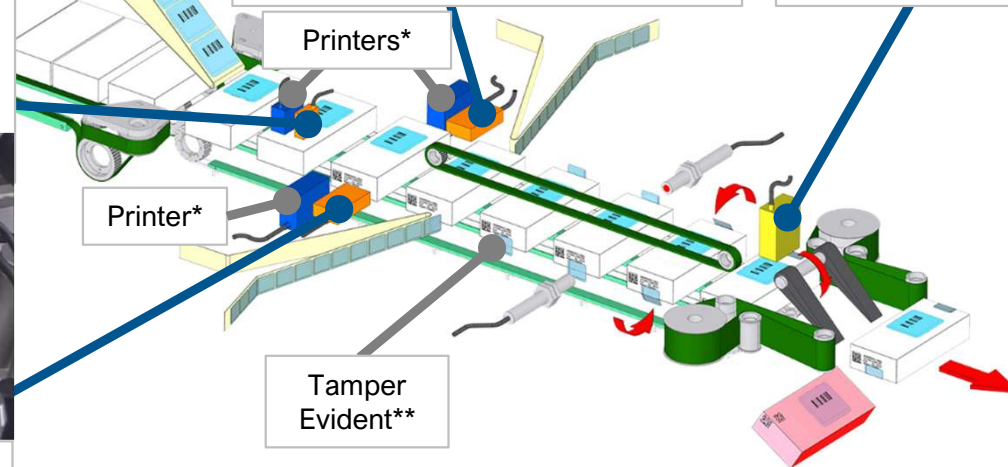
*Tracker manages serialized code and data printing

**Tracker manage automatically decommission of cartons with wrong tamper evident application

Camera 2
Check of serialized code and data on carton top



Camera 1
Check of serialized code and data on carton flap (operator side)



Visual inspection on tablets, capsules and blisters



Size



Shape



Color



Integrity

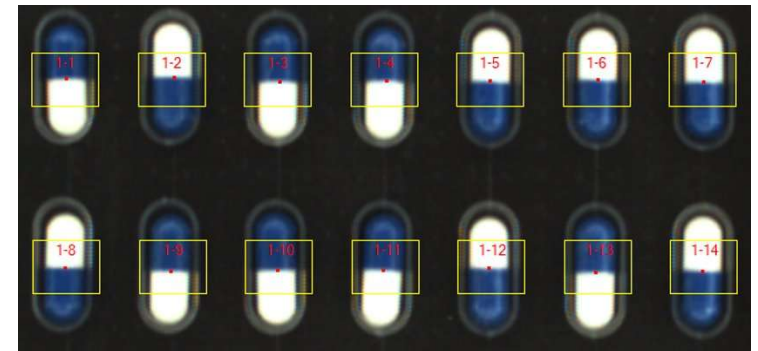
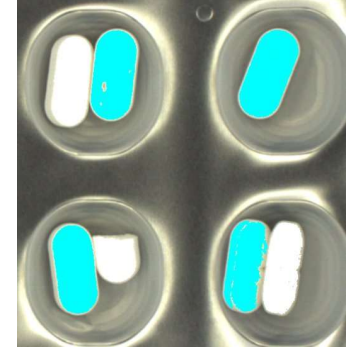
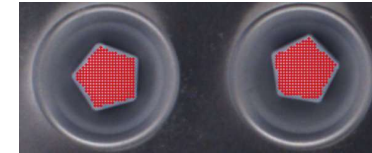
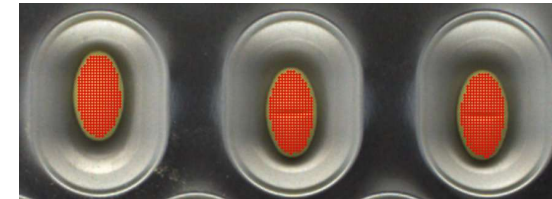


Chipped

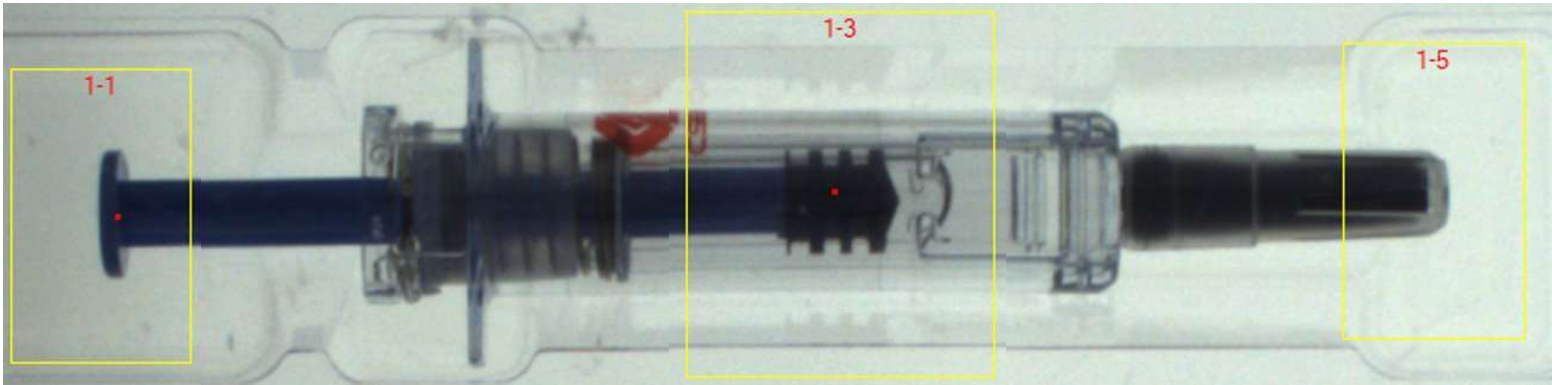


Coating

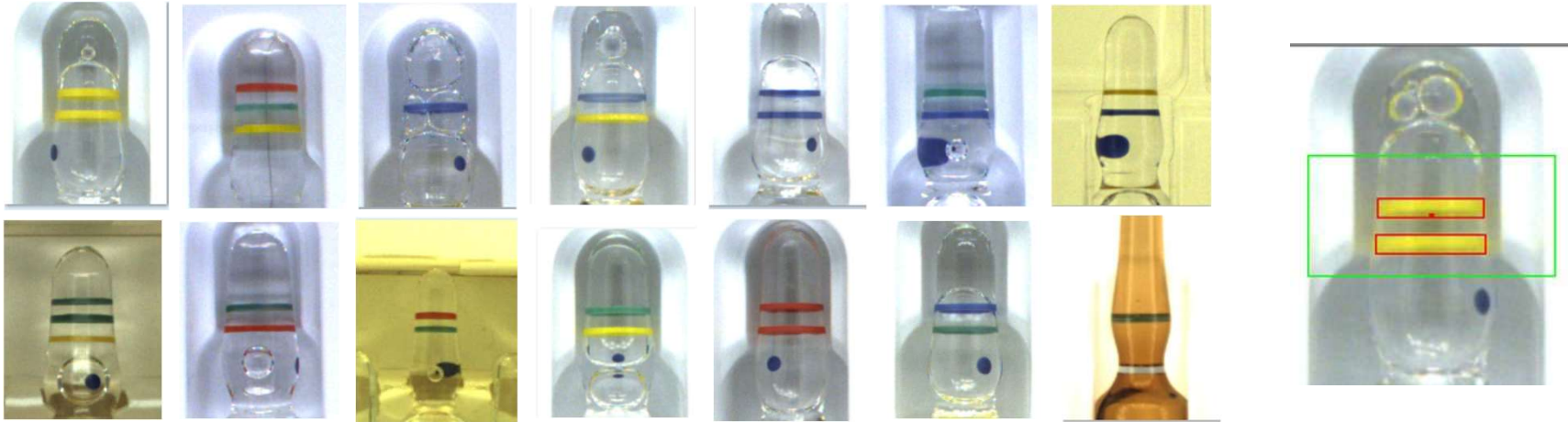
Blister inspection



Multi-part inspection



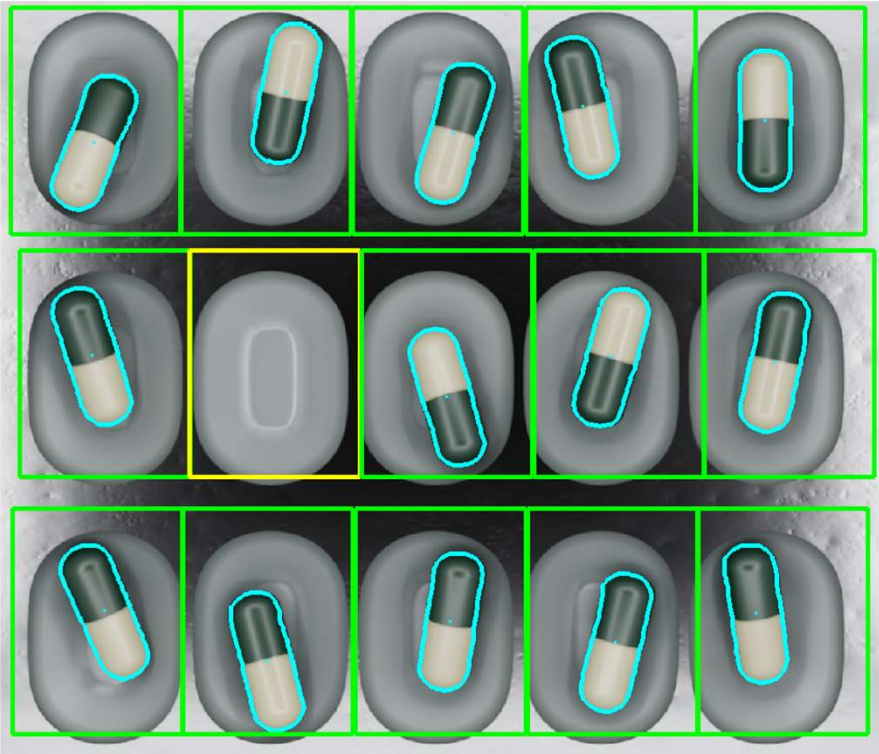
Colored ring inspection



Semantic Segmentation

The use of semantic segmentation based on deep learning reduced number of image processing steps from **21** to **3**

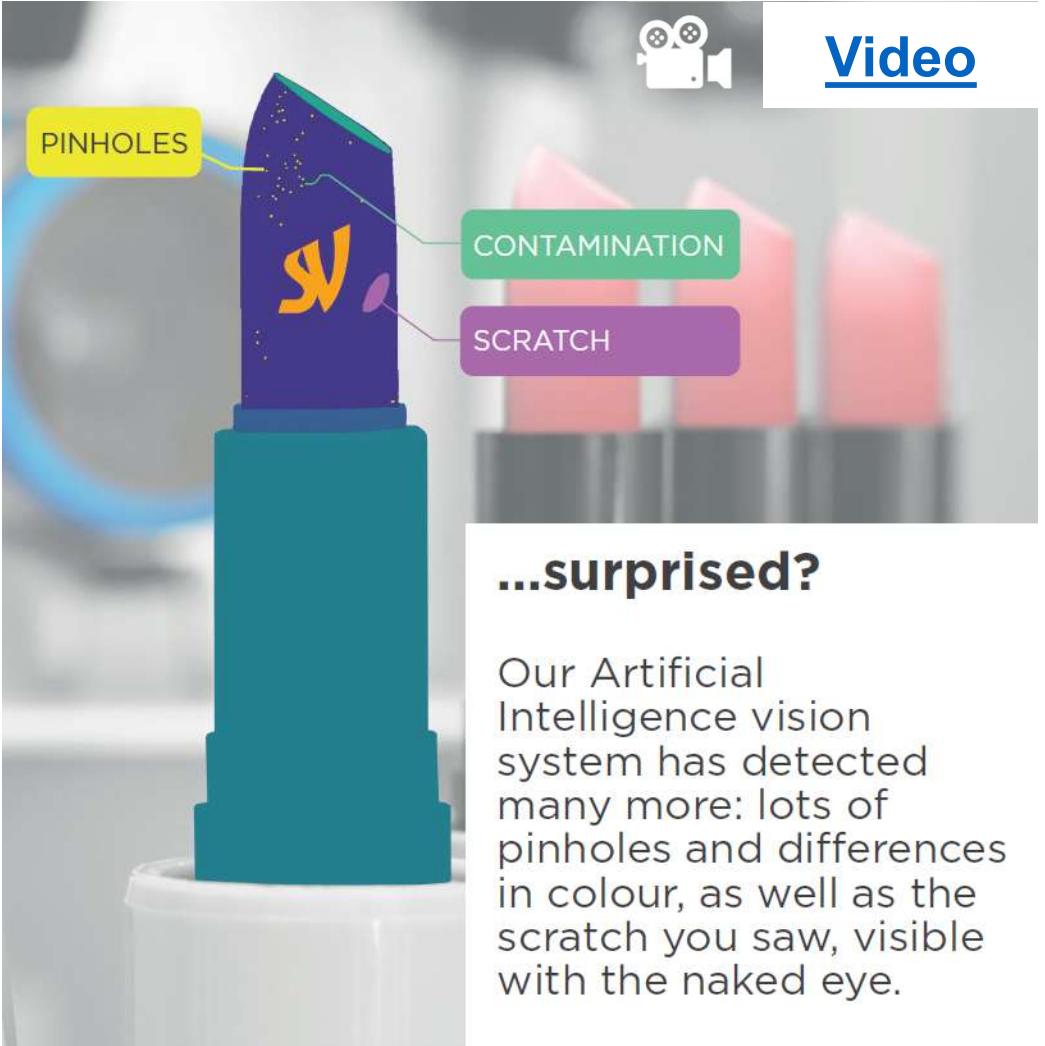
AI	Preneural
Operations of this Measure 1 application of the region of interest: the whole window 2 segmentation with argo vision graph 3 filter semantic components	Operations of this Measure 1 application of the region of interest: the whole window *** trovo la parte bianca *** 3 transformation from RGB to monochrome 4 threshold ($\geq$) 5 morphologic filter: opening 2D 6 extraction of the connected components 7 deletion of the small components (area < threshold) 8 deletion of the lateral components *** trovo la parte nera *** 10 transformation from RGB to monochrome 11 threshold ($\geq$) 12 morphologic filter: opening 2D 13 morphologic filter: closing 2D 14 fill 2D image from side 15 fill 2D image from side 16 $a1(x,y) \text{ OP } b1(x,y)$ *** unisco le due parti *** 18 $a1(x,y) \text{ OP } b1(x,y)$ 19 morphologic filter: closing 2D 20 extraction of the connected components 21 extraction of the max. component



[Video](#)

How many defects
can you see on this
lipstick?

...Only one?



PINHOLES

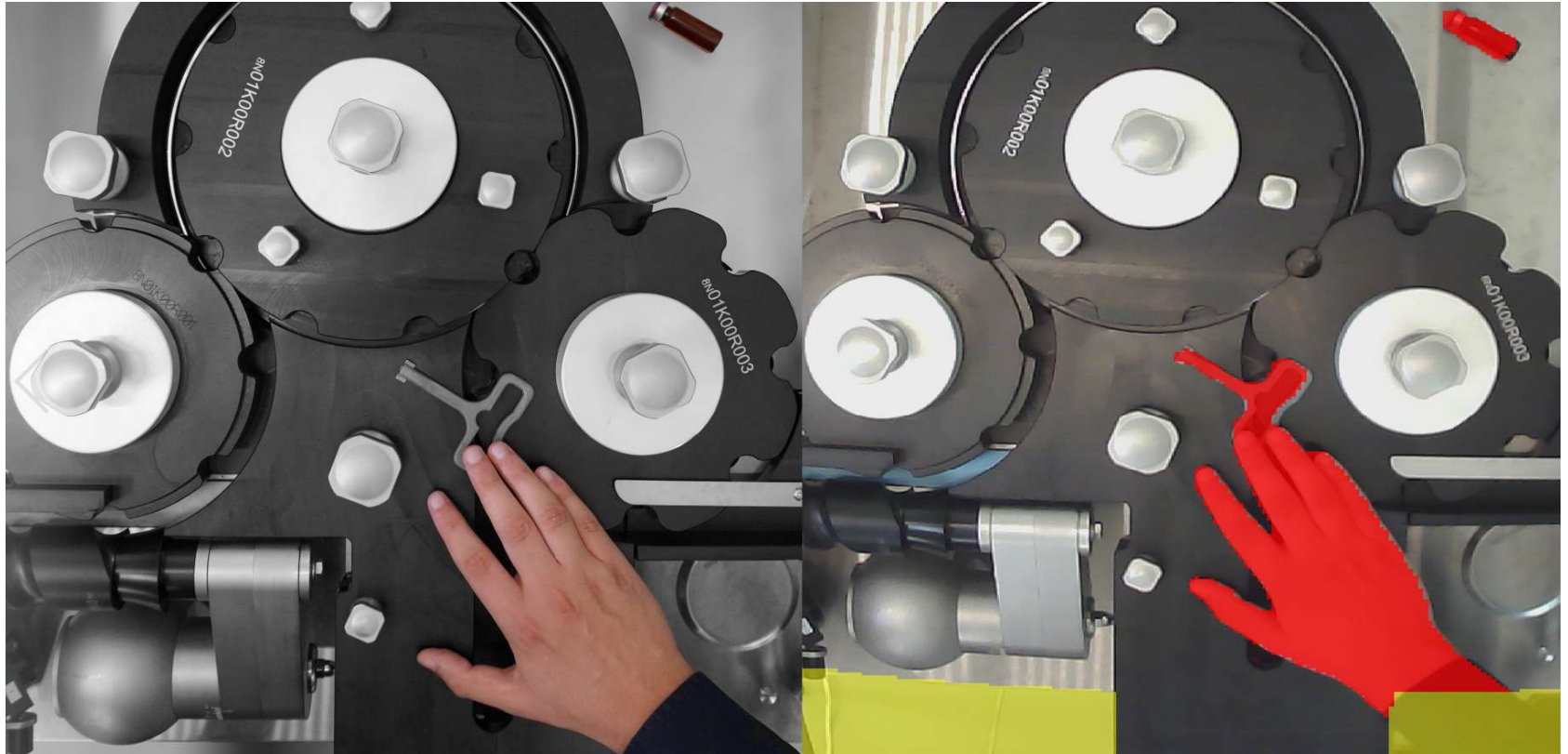
CONTAMINATION

SCRATCH

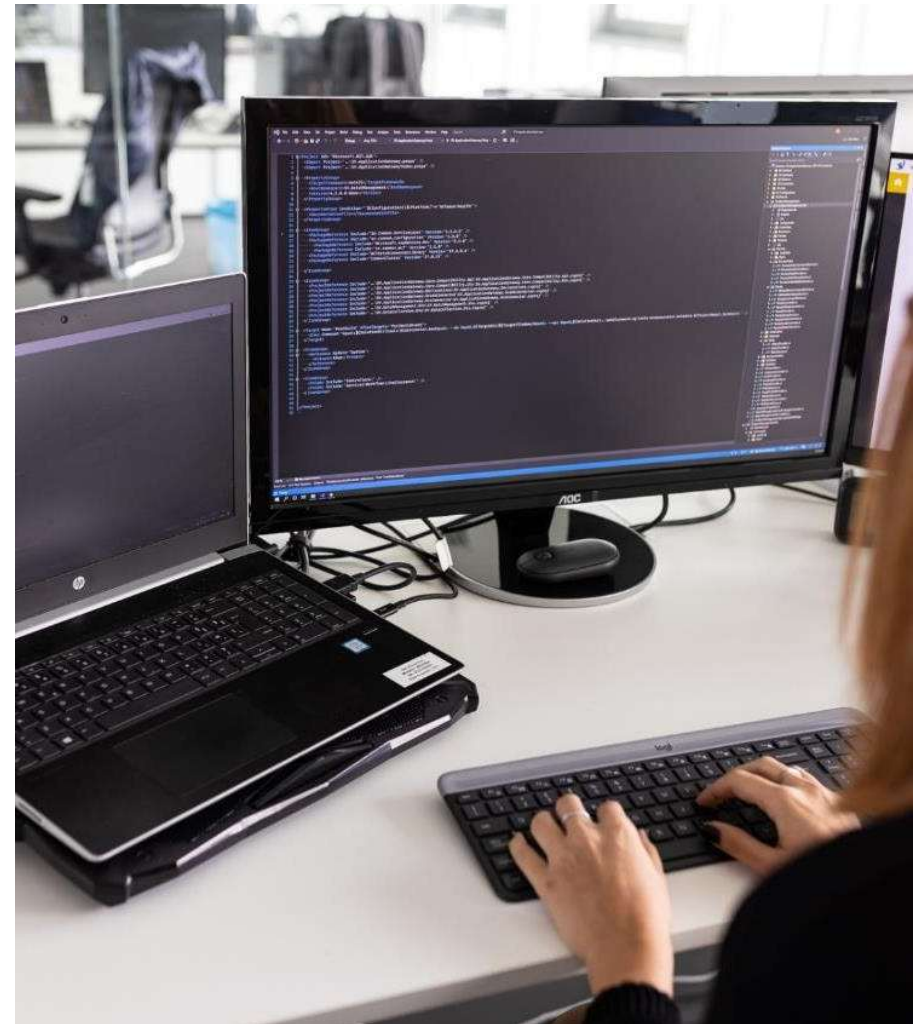
...surprised?

Our Artificial Intelligence vision system has detected many more: lots of pinholes and differences in colour, as well as the scratch you saw, visible with the naked eye.

Line Clearance



Internship - Success Stories



Improving PatchCore Anomaly Detection

Optimizing PatchCore for One-Shot Industrial Anomaly Detection

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Abstract—PatchCore is a widely used algorithm for industrial anomaly detection, due to its high performance compared to alternative approaches. This paper focuses on optimizing its architecture for the challenging case of one-shot anomaly detection. More precisely, we modified the feature extraction step by substituting the original ResNet50 with the Anti-aliased ResNet50, and the dimensionality reduction phase by replacing the original Average Pooling with the Gaussian Random Projection. Comparative experiments conducted on the MVTec Anomaly Detection (MVTec-AD) dataset showed that the proposed modifications can significantly increase performance with respect to the original PatchCore on several common categories of objects.

Index Terms—One-Shot Anomaly Detection, Anti-Aliasing, Dimensionality Reduction, PatchCore

are directed
[13]–[15].

This paper focuses on one-shot anomaly detection, where only one image is available for training. To this end, we propose a modified architecture for PatchCore, where only the feature extraction phase, using ResNet50, and the dimensionality reduction phase, using Gaussian Random Projection, are modified. Our results show that the proposed modifications can significantly increase performance with respect to the original PatchCore on several common categories of objects.

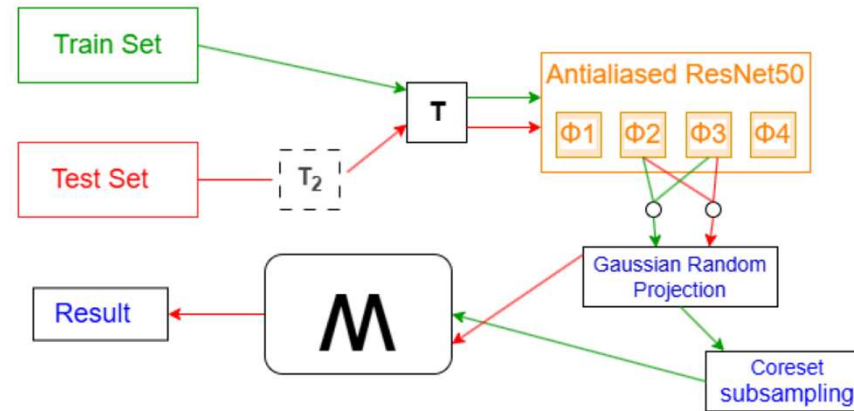
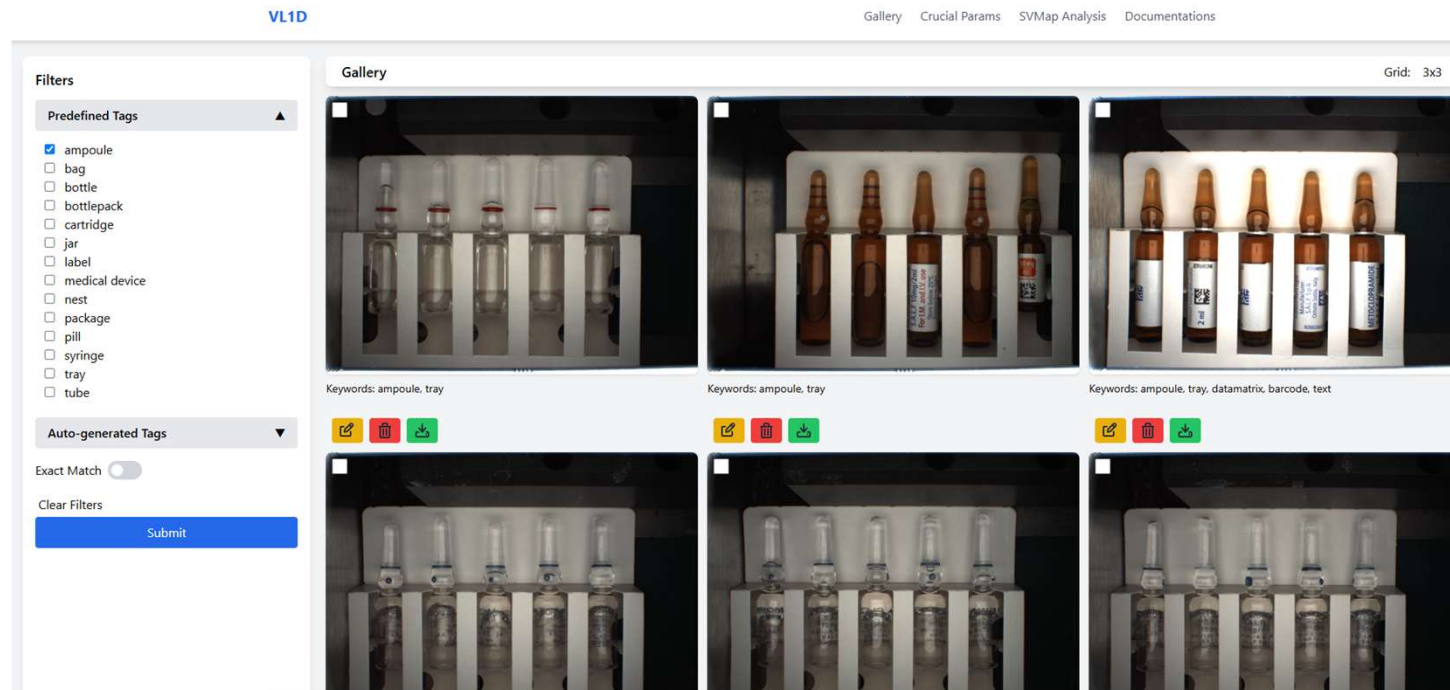


Fig. 2. The proposed architecture, where T is the original pre-processing step, T_2 is an optional pre-processing step to adjust the orientation of test images, M is the memory bank, and ϕ_i are the extracted features.

Unsupervised classification of company data



VGG16 pre-trained Convolutional Neural Network (CNN) for feature extraction, followed by a **Multi-Layer Perceptron (MLP) classifier**, implemented a two-step classification system:

1. Binary classification to separate unwanted and relevant images
2. Multi-label classification to categorize images based on multiple possible classes derived from the company's marketing documentation

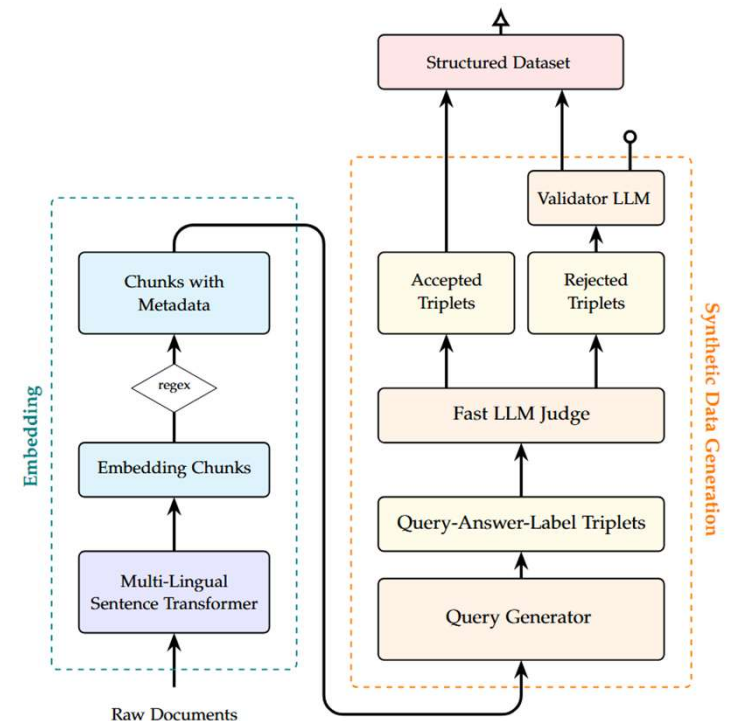
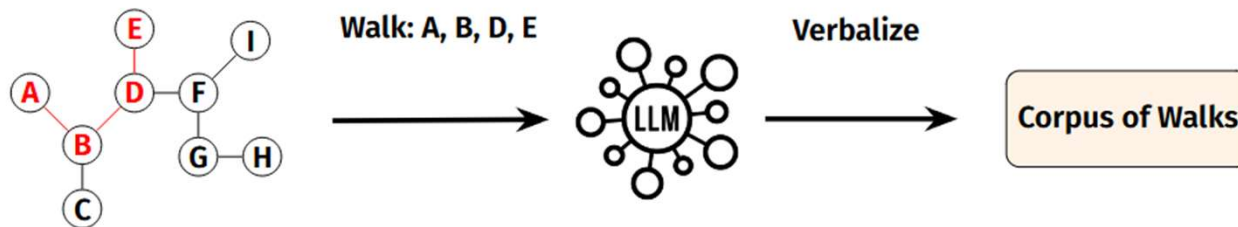
~ 300k images

RAG for Knowledge Base querying

Corporate data analysis: Internal technical documents, predominantly in Italian, were examined, featuring heterogeneous formats and highly specialized content.

Dataset construction: A structured corpus was created from changelogs, using linguistic models to generate concise questions and answers. Implementation and testing of different RAG approaches: Methods based on text retrieval (sparse, dense, hybrid) and knowledge graphs (SemRAG, Walk&Retrieve) were compared.

Quantitative and qualitative evaluation: System performance was measured using standard metrics and through testing with corporate developers (interviews and evaluation questionnaires).



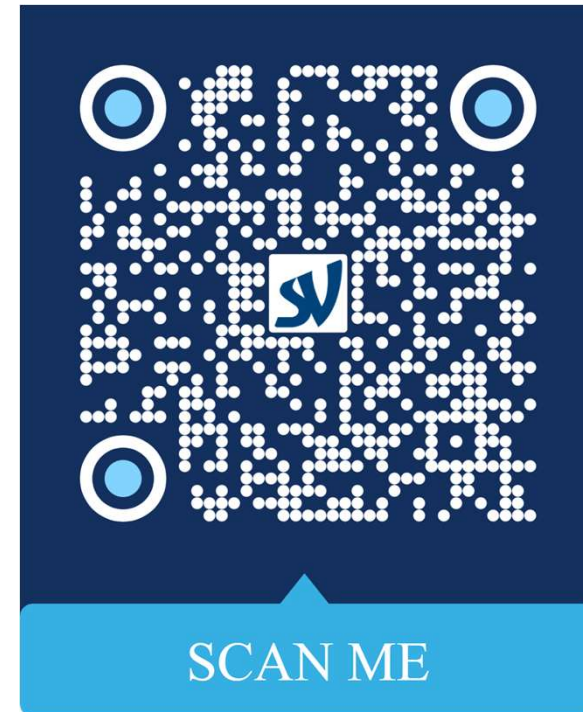
Let's keep in touch

For further info:

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mantolini@seavision-group.com

Stay updated on our
job opportunities





TALENT VISION 25



Potential and Talent: The Two Forces of Success

An event dedicated to celebrating talent and discovering the potential that drives success.
An opportunity to get inspired, grow, and connect.



Tuesday, November 11th, 2025 | 6:00 PM

Via Claudio Treves 9 – Pavia

Guests

- **Maria Assunta Zanetti** – Associate Professor of Developmental and Educational Psychology at the University of Pavia
- **Vittorio Pettinato** – Comedian
- **Aurelio Paviato** – Illusionist

Moderator

Filippo Poletti – Journalist and LinkedIn Top Voice Italy



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