UNIVERSITÀ DEGLI STUDI DI MILANO

SEAVISION



Meeting with the students of the ‘Artificial Intelligence’ degree program

Università degli Studi di Milano

November 9th, 2026

Speaker

SEAVISION



Michele Antolini

Technical Program Manager
Software Department SEA Vision

Let's connect
on LinkedIn

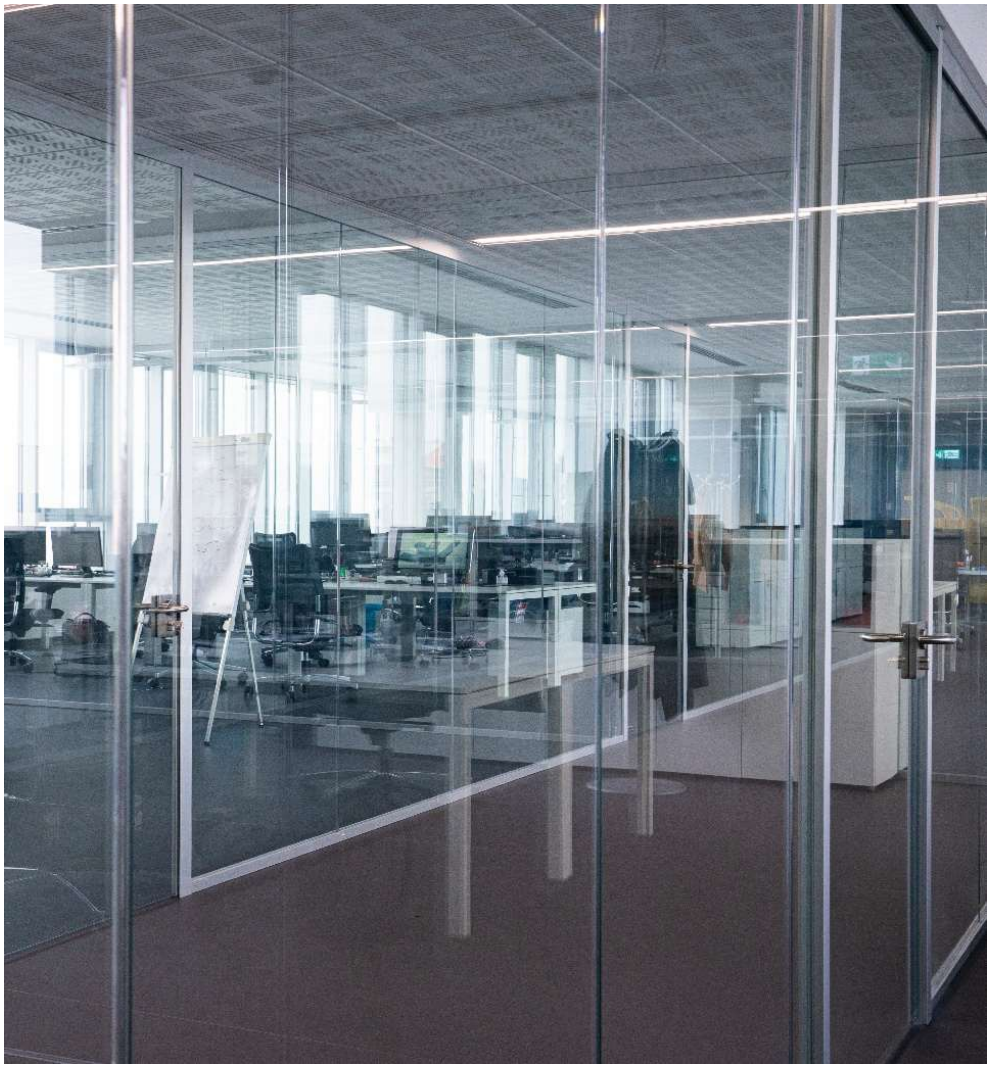
Where is SEA Vision?





Headquarters: Pavia (PV)
Via Carlo Treves 9

SEA Vision: who we are



Who we are



VISION
To be acknowledged as the best pharmaceutical vision systems provider

MISSION
To provide pharmaceutical industry with the highest-quality vision systems

QUALITY
To provide satisfactory products and services

We design and develop software solutions for the pharmaceutical industry with a continuous commitment to **Research & Development**, to provide highly innovative and customized projects.

Our portfolio is structured into three main Business Units:

VISION INSPECTION SYSTEM

SERIALIZATION AND AGGREGATION SOLUTIONS

4.0 PHARMA SOFTWARE SUITE

We are a young and fast-growing group driven by a passion for **innovation** in healthcare and a curiosity for the **future**

SEA Vision Group

+420
People
*Included ARGO Vision Team

10
Offices
*Included ARGO Vision Office

+2500
Lines Managed worldwide

+10.500
Vision system installed worldwide

Financial data 2024

58,6M	16,4M
Revenue	EBITDA



Our Work Environment

We believe that **true value lies in people**.

Every talent contributes **passion** and **ideas** to the **growth of our group.**

We promote **inclusion**, **collaboration**, and **respect**, and we are committed to **sustainability**, **well-being**, and **social responsibility projects** to create a **positive impact** on the world and the local communities around us.

Our Values

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BELONGING



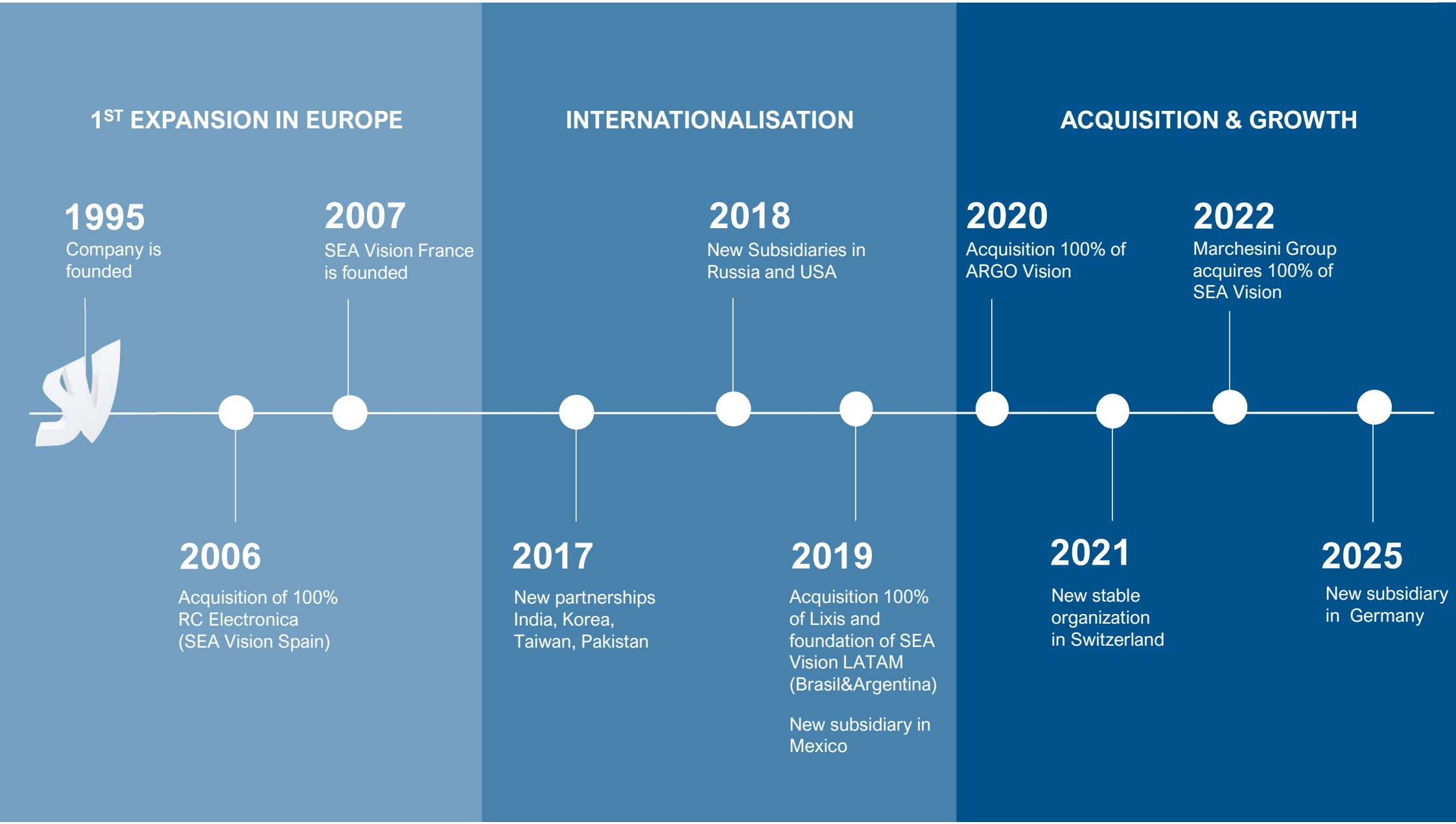
INNOVATION



COURAGE



DIALOGUE


1ST EXPANSION IN EUROPE
INTERNATIONALISATION
ACQUISITION & GROWTH
1995
Company is founded
2007
SEA Vision France is founded
2018
New Subsidiaries in Russia and USA
2020
Acquisition 100% of ARGO Vision
2022
Marchesini Group acquires 100% of SEA Vision
2006
Acquisition of 100% RC Electronica (SEA Vision Spain)
2017
New partnerships India, Korea, Taiwan, Pakistan
2019
Acquisition 100% of Lixis and foundation of SEA Vision LATAM (Brasil&Argentina)
New subsidiary in Mexico
2021
New stable organization in Switzerland
2025
New subsidiary in Germany

Growing Talent Together



We collaborate with universities, academic institutions, and local organizations to **attract outstanding talent** and **strengthen our connection with the community**.



By investing in education and fostering long-term partnerships, we **help nurture the skills and potential of future professionals**.



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POLITECNICO MILANO 1863

Liceo Olivelli Scientifico+STEM

UNIVERSITÀ DI PAVIA

FONDAZIONE LE VELE ETS

Unipv LM+

"G. Cardano"- Pavia
Istituto Tecnico Industriale Statale
Liceo Scientifico opzione Scienze Applicate

Politecnico di Torino

I.T.S. LOMBARDIA meccatronica ACADEMY

UNIVERSITÀ DEGLI STUDI DI MILANO

INSTITUTE FOR TRANSFORMATIVE INNOVATION RESEARCH

UPO UNIVERSITÀ DEL PIEMONTE ORIENTALE

UNIVERSITÀ DEGLI STUDI DI MILANO BICOCCA

ITSAR ITS ACADEMY ANGELO RIZZOLI

CVMLab

Fondazione Luigi Clerici

Software points of strength and references

SEAVISION



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)

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Some of our Best Pharma Customers

Serialization and aggregation hierarchy model

(according to ISA 95)

rev.4 2024

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LEVEL 5
Government repository level

EMVO, MDLP, etc

LEVEL 4
Enterprise level

yudge_ — Serialization data manager

TTmonitoring_ — Track & Trace dashboards and BI

reworkapp_ pickapp_ — Warehouse Management

LEVEL 3
Plant level

ERP connector: yudesk+

MES connector: yulink_

yutrace_ yudesk_ — Serialization data manager; Product / Process data management

yuview_ yubi_ — Business intelligence analysis; Data analytics & KPIs

LEVEL 2
Line level



yurun_ yudesk_ — Line manager; Line data management; Recipe manager; Access control; Batch reports

yuview_ — Real-time dashboards; OEE & KPIs

LEVEL 1
Packaging systems level

Machine setup
Condition monitoring
Predictive maintenance
Remote assistance



Print and check

tracker_ — Serialization system

Machine setup
Condition monitoring
Predictive maintenance
Remote assistance
Advanced robotics



End of line equipment

tracker_ — Aggregation system

LEVEL 0
Devices level

Printer
Camera
Scanner

Camera
Camera
Printer
Scanner

Tracker | Serialization possible configuration on print and labelling machine

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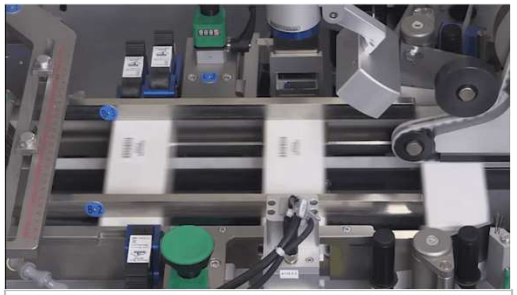
Camera 3
Check of serialized code and data on carton flap (opposite to the operator side)



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

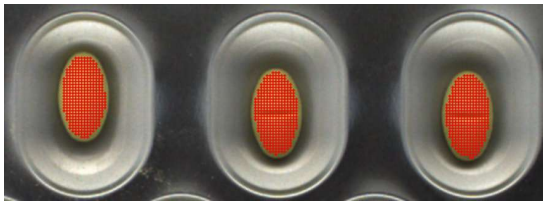
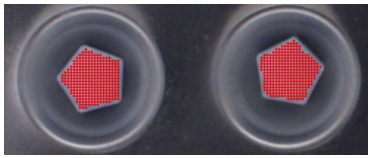
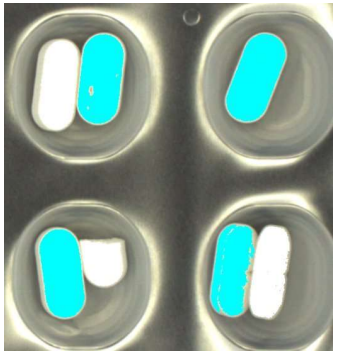
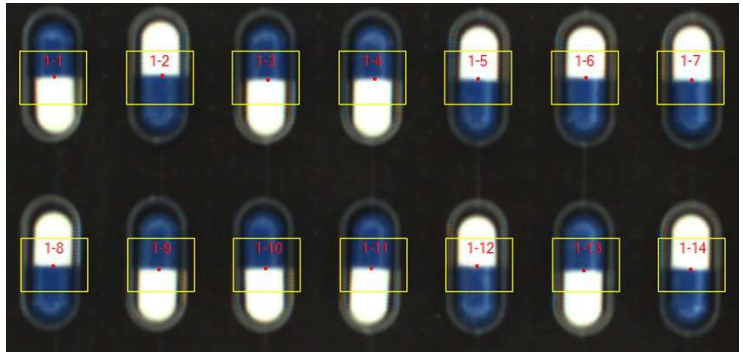


Chipped



Coating

Blister inspection

Multi-part inspection

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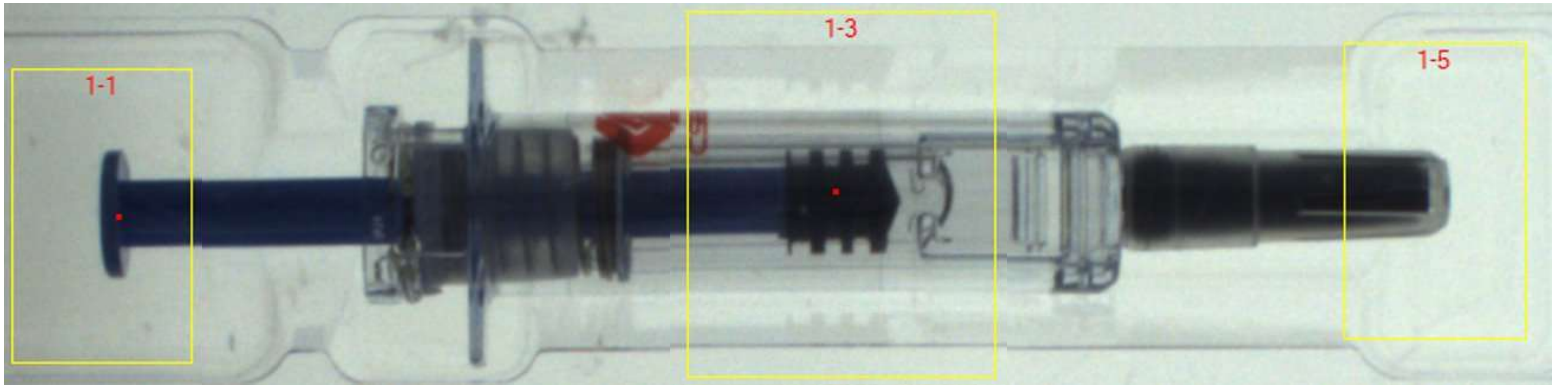
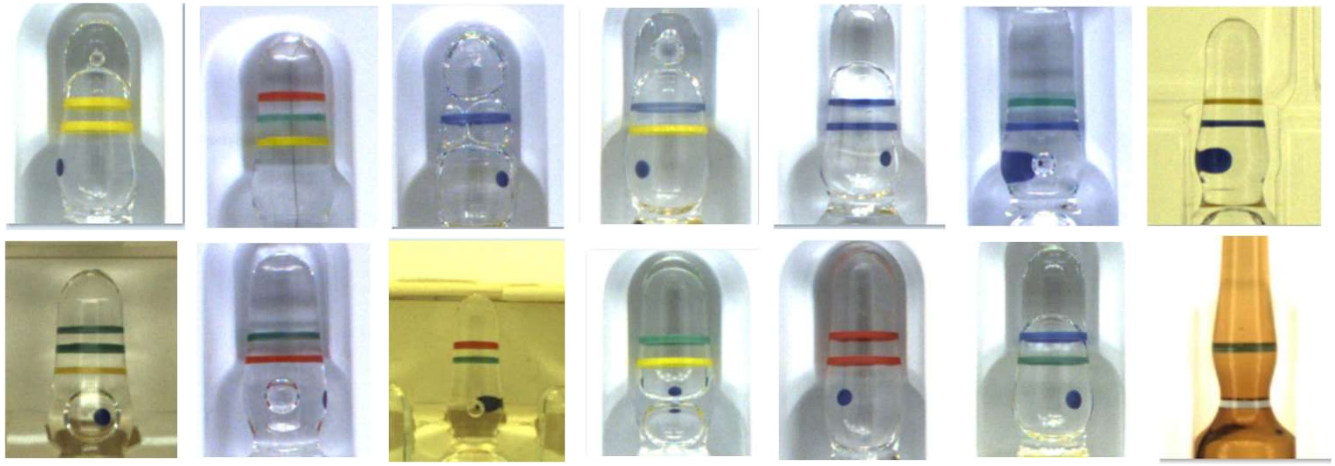
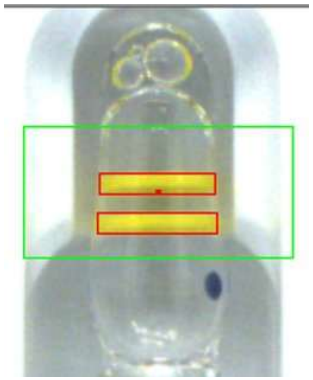


Colored ring inspection





Semantic Segmentation

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

AI

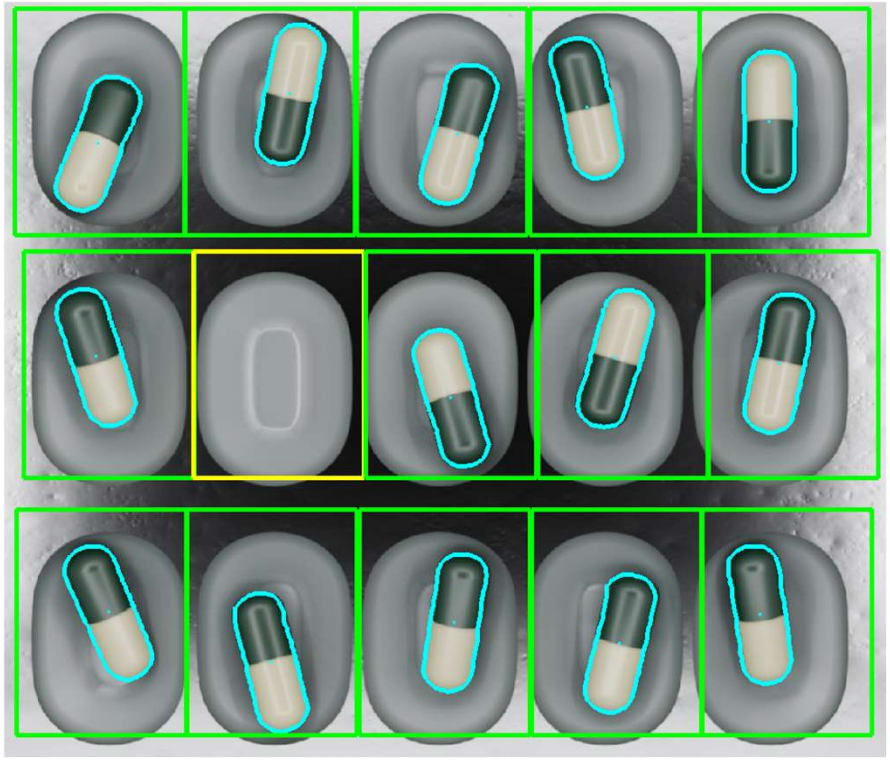
Operations of this Measure

1 application of the region of interest: the whole window
2 segmentation with argo vision graph
3 filter semantic components

Preneural

Operations of this Measure

1 application of the region of interest: the whole windo
*** trovo la parte bianca ***
3 transformation from RGB to monochrome
4 threshold (>=)
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 (>=)
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) OP b1(x,y)
*** unisco le due parti ***
18 a1(x,y) OP b1(x,y)
19 morphologic filter: closing 2D
20 extraction of the connected components
21 extraction of the max. component



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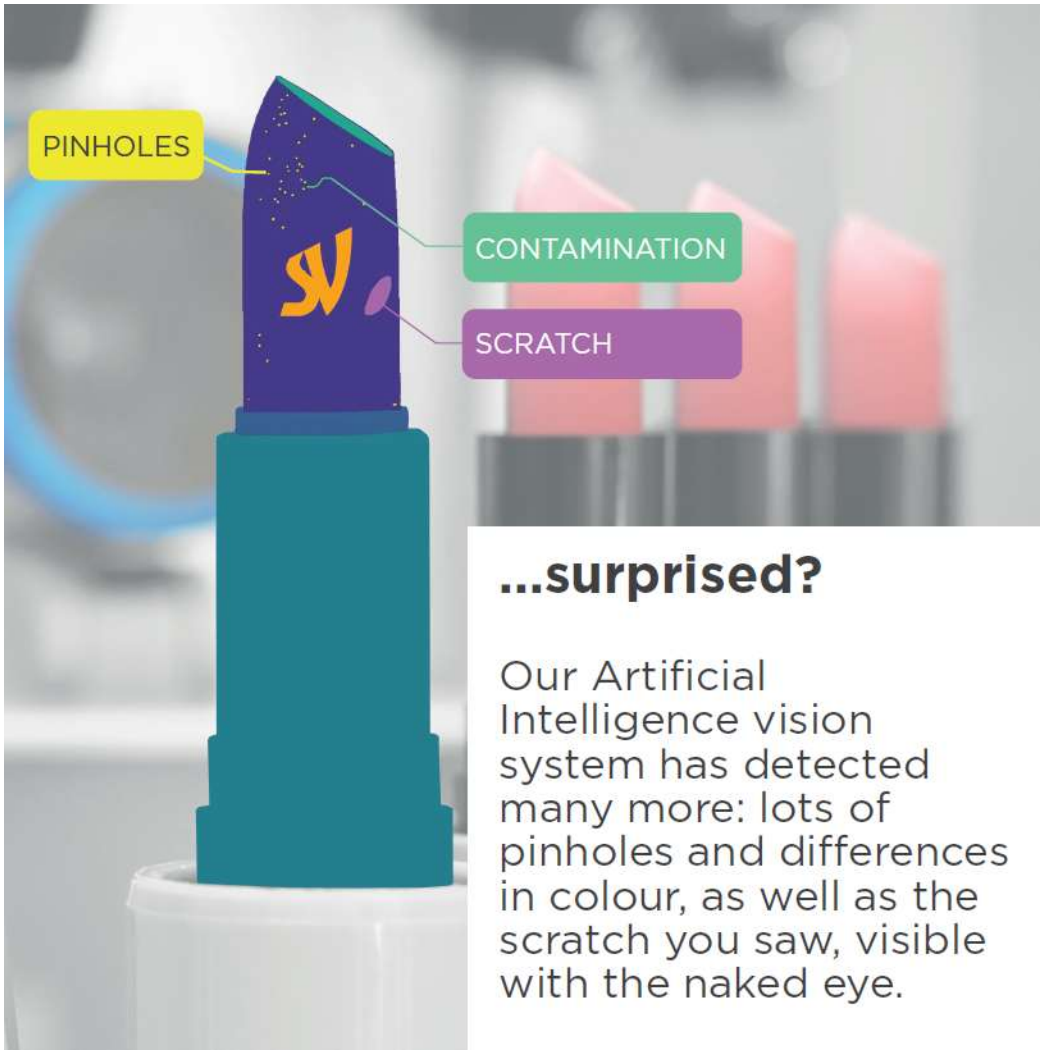
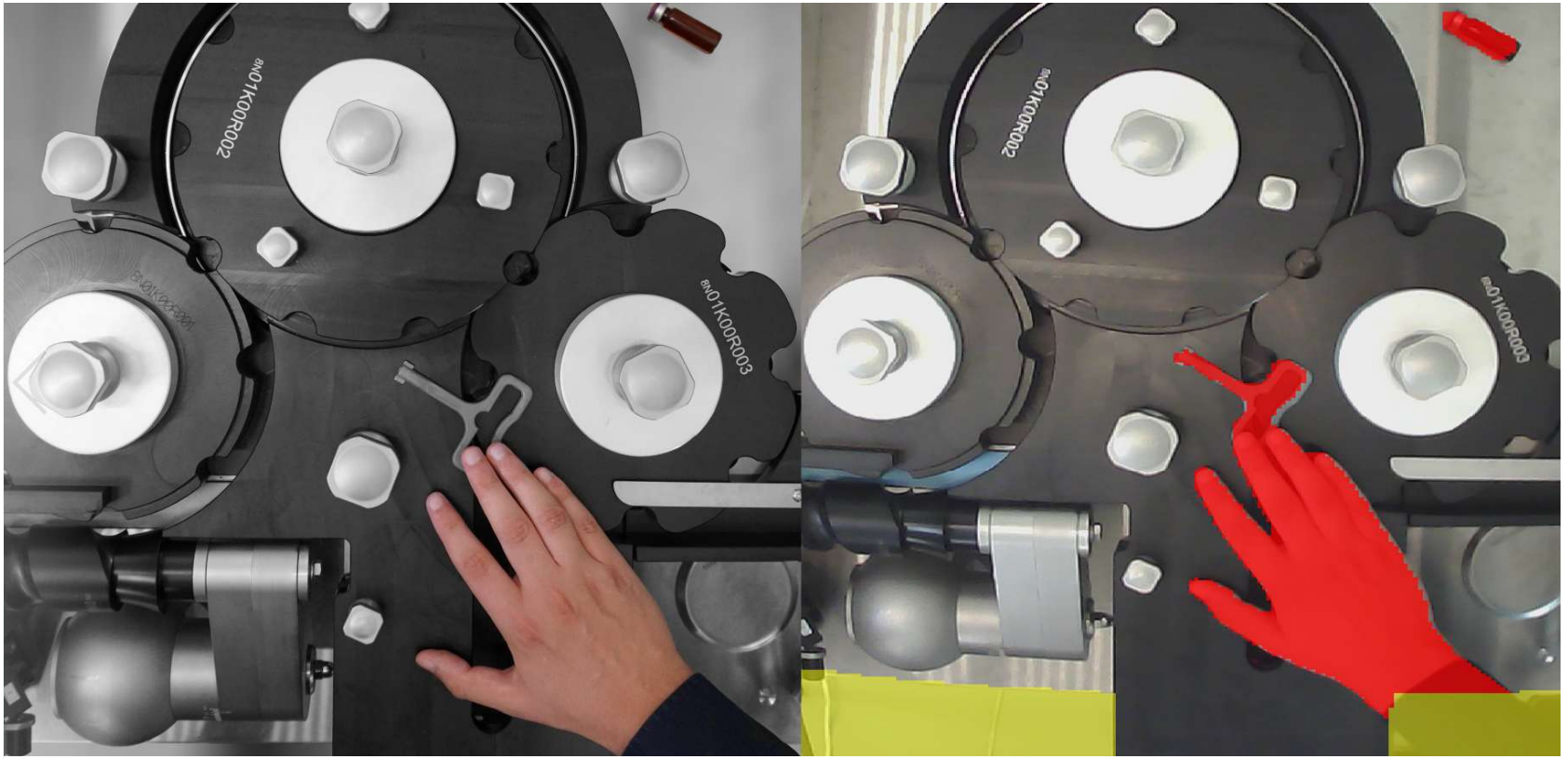


...surprised?

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

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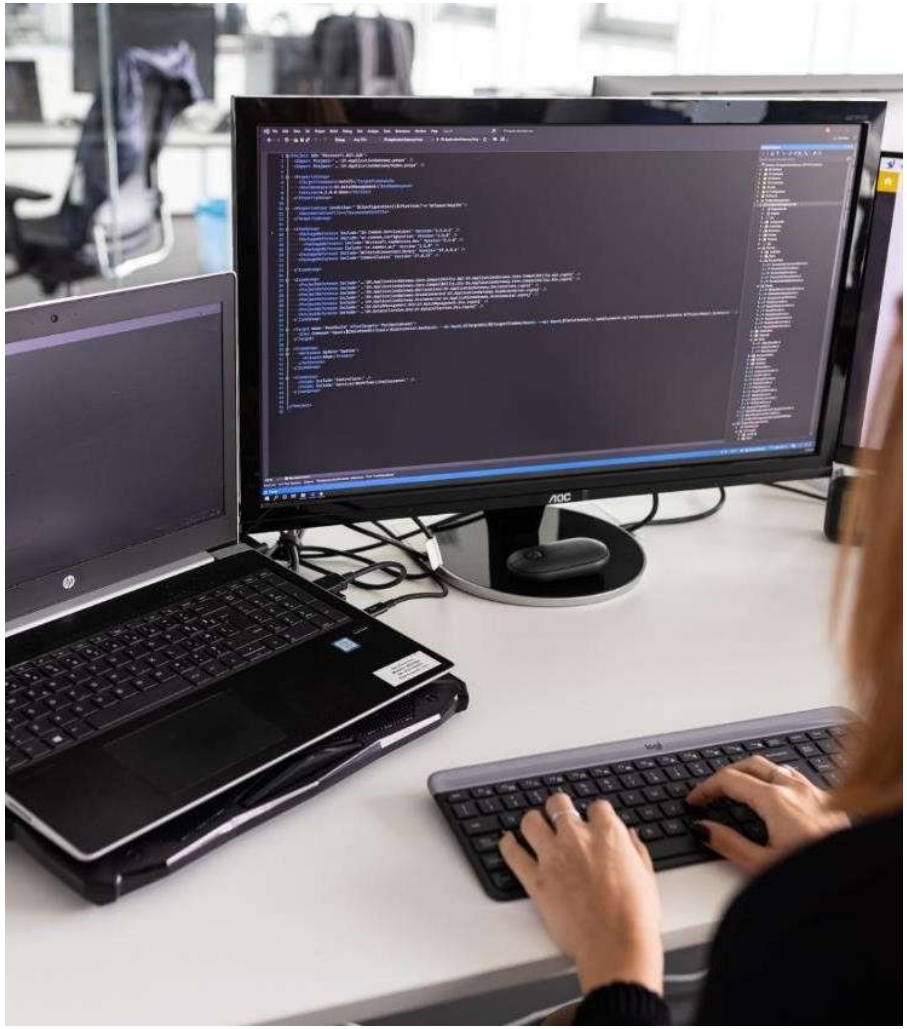

Improving PatchCore Anomaly Detection

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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**

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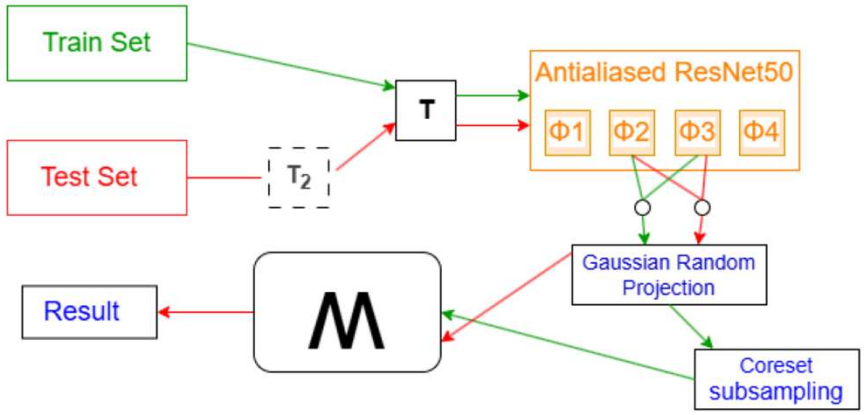
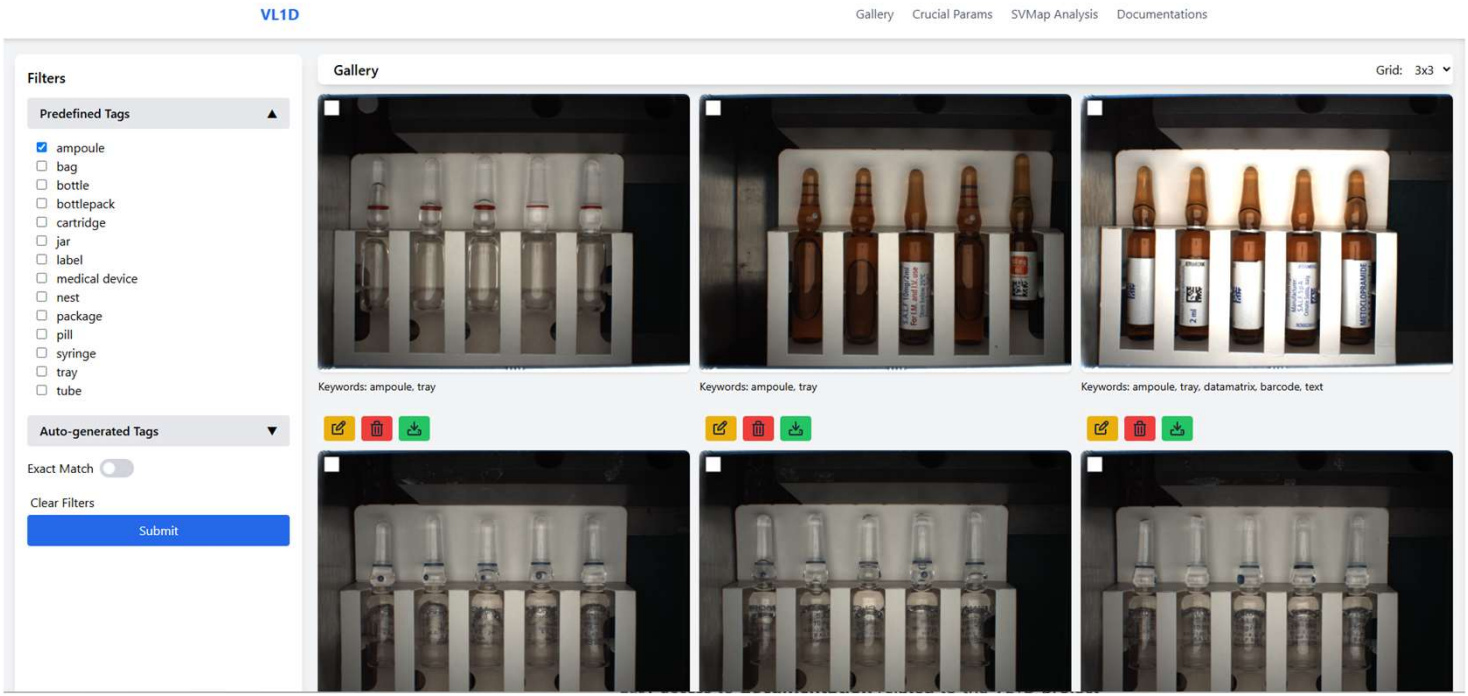


Fig. 2. The proposed architecture, where T is the original pre-processing step, T_2 is an optional pre-processing step to adjust the orientation of test images, M is the memory bank, and ϕ_i are the extracted features.

Intern: Simona Zlatanova (2023)

Unsupervised classification of company data



VGGI6 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

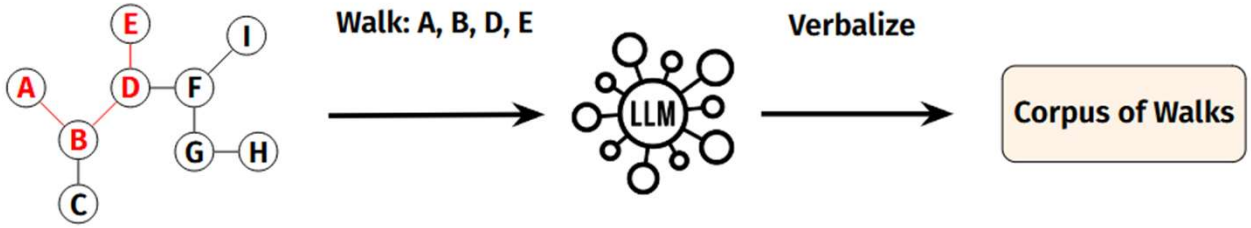
Intern: Matin Khayat (2024)

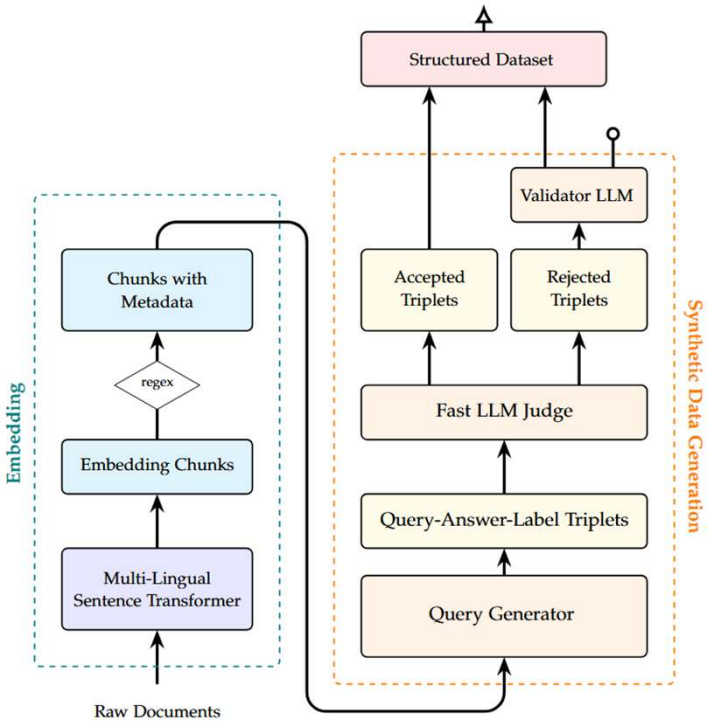
RAG for Knowledge Base querying

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).

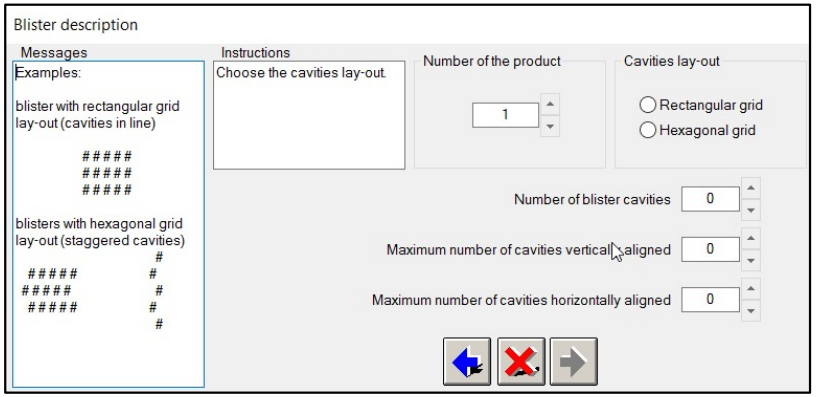


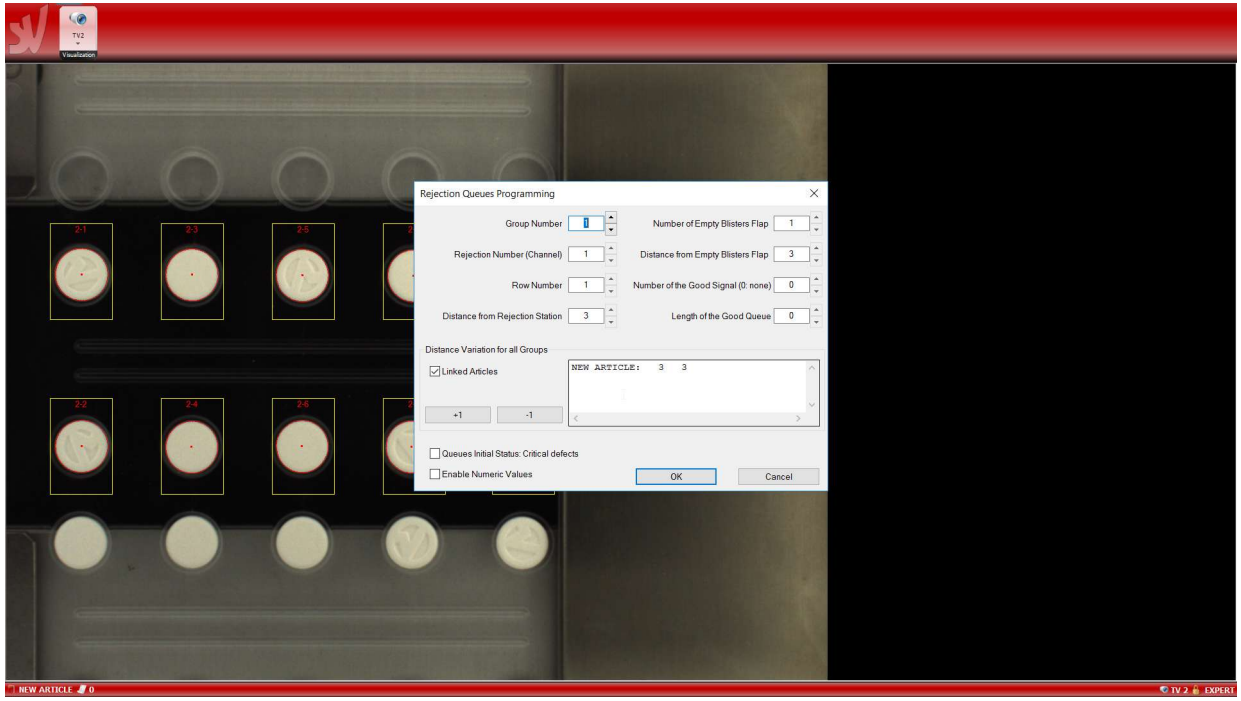


Intern: Andrea Pan (2025)

AI-Assisted Wizard (in progress)

- Reduce and optimize our **14-Step Wizard for Capsules and Tablets** using vision models and language models
- Get more info from acquired images (vision model)
- Extract knowledge from context files like datasheet, technical documents (language model)
- How to create a wizard for new products?





Intern: Gabriele Paone (2026)

Let’s keep in touch

For further info:

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risorseumane@seavision-group.com

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