

# DAI PIXEL ALLA PERFEZIONE: IL CONTROLLO QUALITÀ COSMETICO NELL'ERA NEURALE

FRANCESCO RINGRESSI  
BUSINESS DEVELOPMENT MANAGER

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fringressi@seavision-group.com



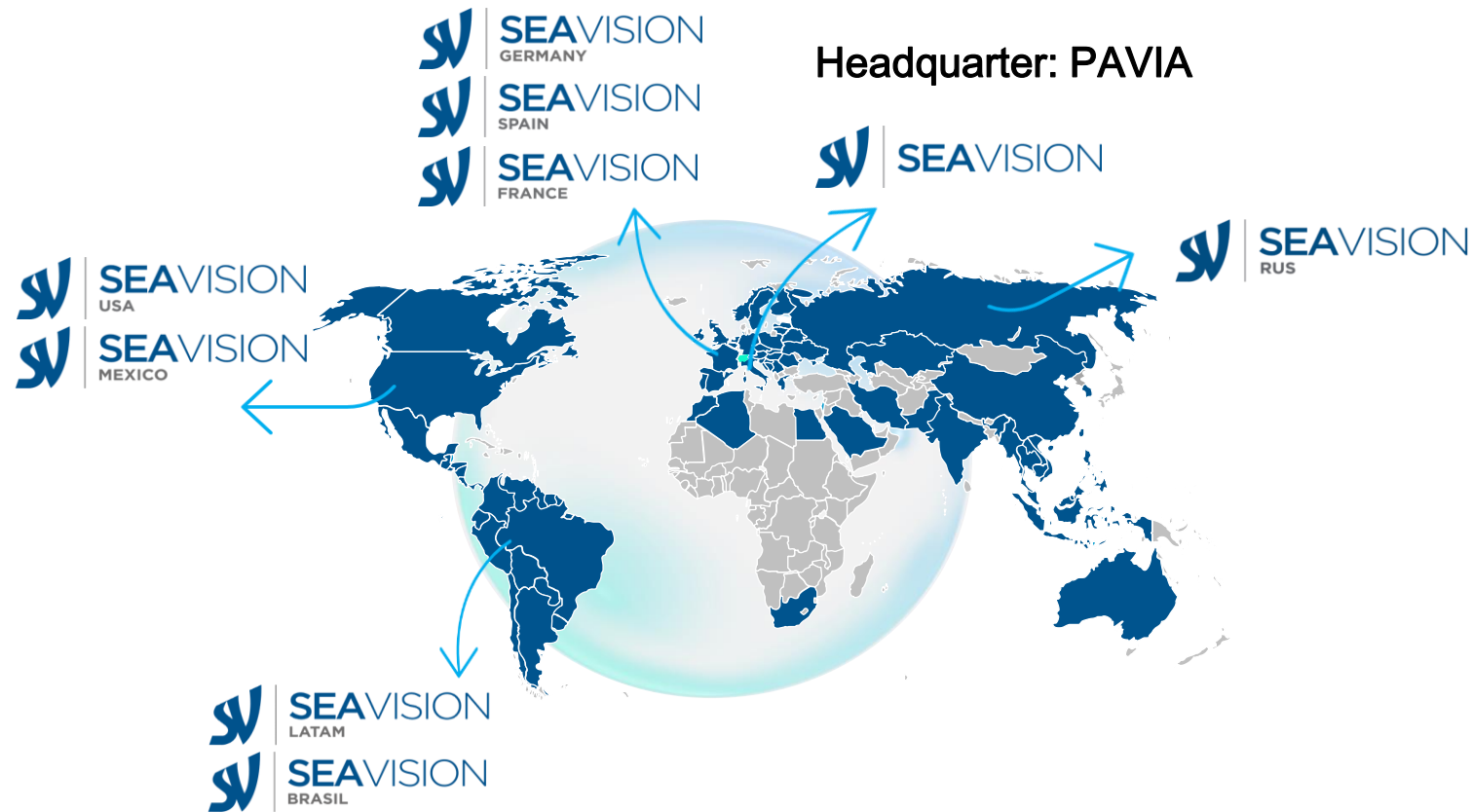
**INTELLIGENZA ARTIFICIALE E COSMETICA:  
PERSONE E MACCHINE CHE CREANO BELLEZZA**

**Dip di Informatica - Università di Milano**

**11 Marzo 2026**

# CORPORATE PRESENTATION

# SHAPING LIFE SCIENCE INNOVATION FOR OVER 30 YEARS



# ALCUNI NUMERI

10,000+

Sistemi di visione installati nel mondo

30+

Anni nel settore Life Science & Automation

2500+

Linee con full Track and Trace e Brand Protection

420+

Dipendenti nel mondo

75%

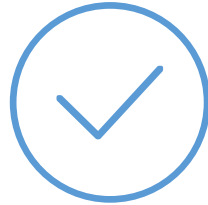
Del nostro personale viene da discipline STEM



# IL NOSTRO APPROCCIO



Un motore,  
tanti prodotti



Open Innovation  
as a biz. model



Controllo  
completo del  
codice sorgente



# AI VISION KNOW HOW



Segmentation



Detection



Tracking



Inspection



OCR & Text





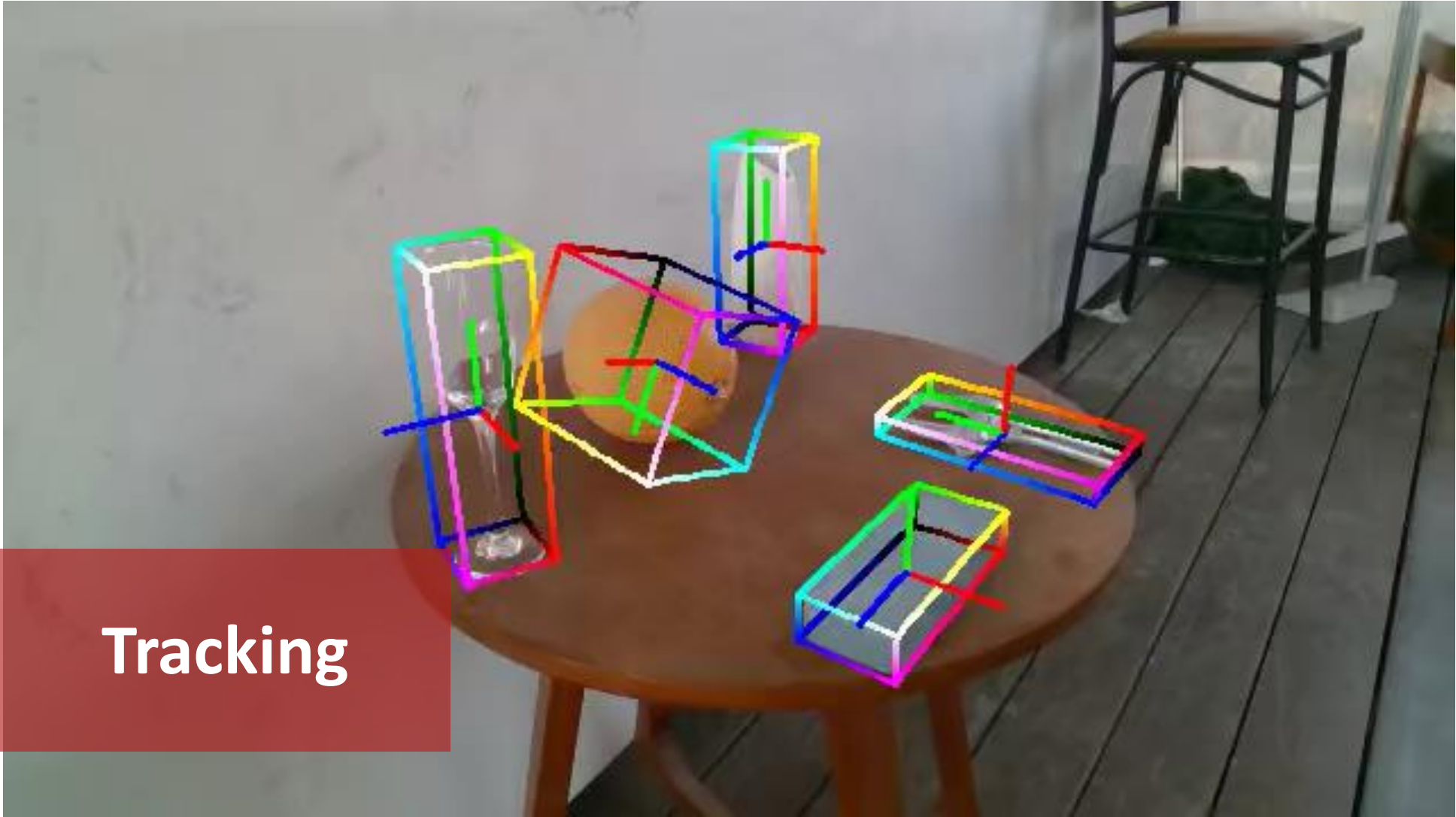
# Segmentation





Detection





# Tracking



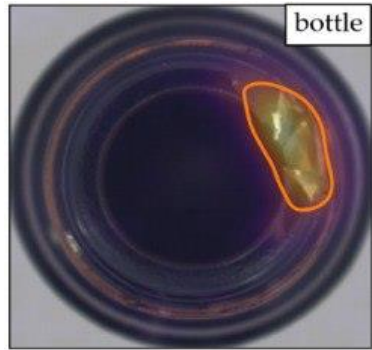


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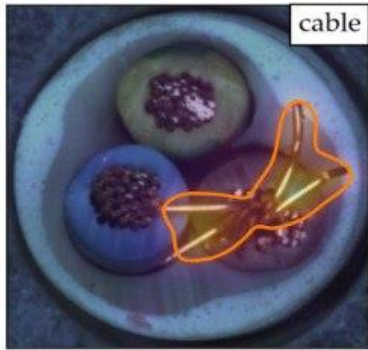
AA233FF 79%

OCR & Text





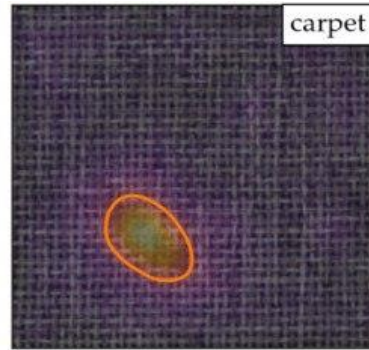
bottle



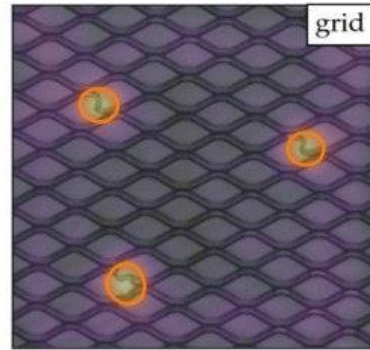
cable



capsule



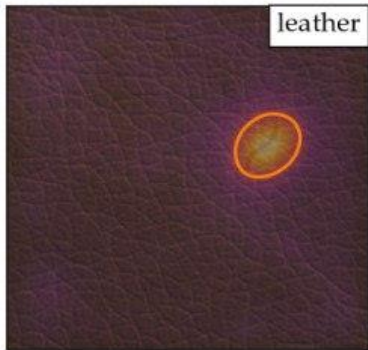
carpet



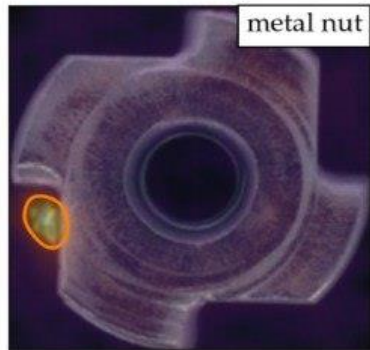
grid



hazelnut



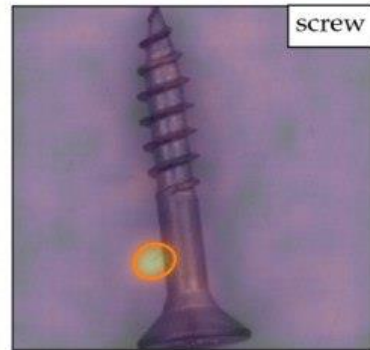
leather



metal nut



pill



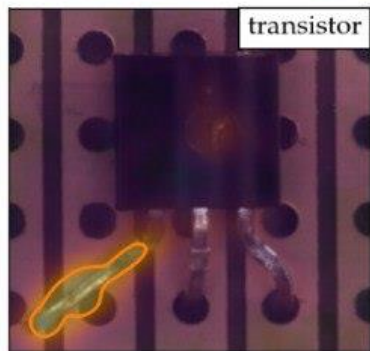
screw



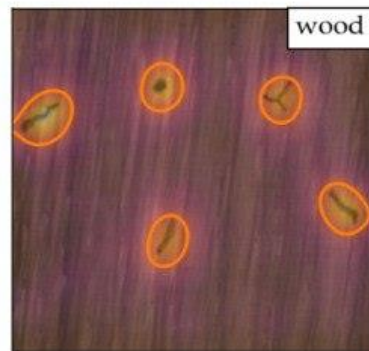
tile



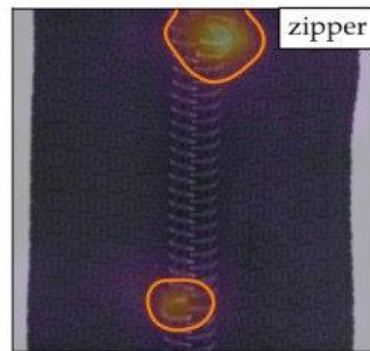
toothbrush



transistor



wood

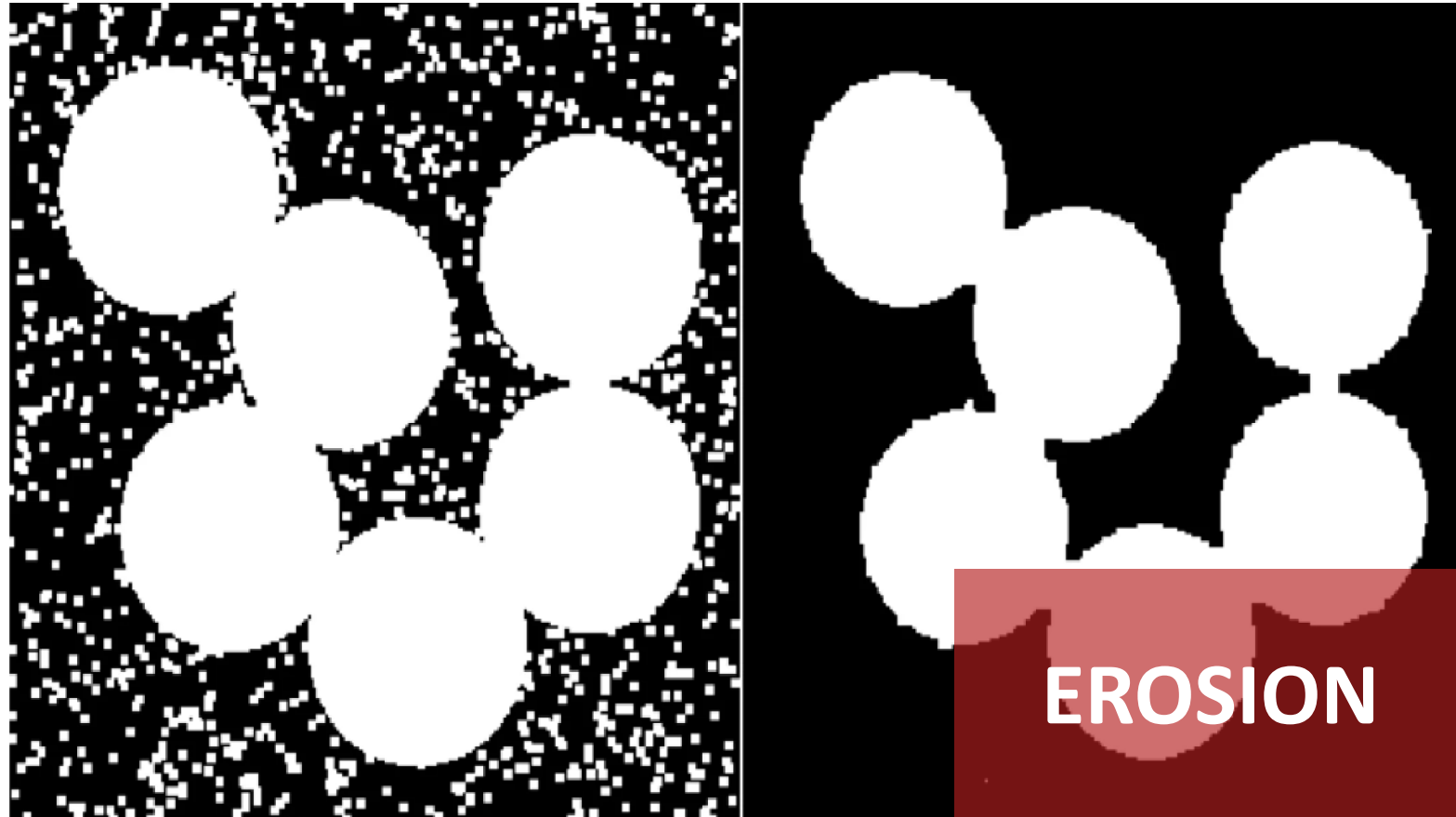


zipper

# Inspection



# USE CASE # 1



# Vecchio codice

```
void Crandini()
{
    unsigned char *matrice, /* matrice di input */
    unsigned char *mat_out, /* matrice risultato lungo quanto matrice */
    int lato_n, /* larghezza di matrice */
    int lato_p, /* altezza di matrice */
    int dim_mat, /* larghezza della matrice */
    int dim_mat_p, /* altezza della matrice */
    int passo_sottocampionamento; // 1, 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 101, 103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163, 167, 173, 179, 181, 191, 193, 197, 199, 211, 223, 227, 229, 233, 239, 241, 251, 257, 263, 269, 271, 277, 281, 283, 293, 307, 311, 313, 317, 331, 337, 347, 349, 353, 359, 367, 373, 379, 383, 389, 397, 401, 409, 419, 421, 431, 433, 439, 443, 449, 457, 461, 463, 467, 473, 479, 487, 491, 499, 503, 509, 517, 521, 523, 529, 533, 541, 547, 551, 557, 563, 569, 571, 577, 581, 587, 593, 599, 601, 607, 611, 613, 617, 619, 623, 629, 631, 637, 641, 643, 647, 653, 659, 661, 667, 671, 673, 677, 683, 689, 691, 697, 701, 703, 709, 713, 719, 727, 731, 733, 739, 743, 749, 751, 757, 761, 763, 769, 773, 779, 781, 787, 791, 793, 797, 803, 809, 811, 817, 821, 823, 829, 833, 837, 841, 847, 851, 853, 857, 859, 863, 869, 871, 877, 881, 883, 887, 893, 897, 901, 907, 911, 913, 917, 919, 923, 929, 931, 937, 941, 943, 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```

# Nuovo Codice

```
std::array<uint8_t, BUFFER_SIZE> buffer;
std::pmr::monotonic_buffer_resource pbr(buffer.data(), buffer.size());

auto runLoop = [&](const size_t size, const size_t kernelSize, auto &&in, auto &&out) noexcept {
    int foregroundPixels = 0;
    std::pmr::vector<uint8_t> kernelData(kernelSize, &pbr);
    const size_t rad = kernelSize / 2;
    auto itIn = in.begin();
    auto itOut = out.begin();
    for (const auto &end = in.end(); itIn != end; ++itIn, ++itOut) {
        if (kernelSize <= 64) {
            foregroundPixels += inner_loop<kind, true>(*itIn, *itOut, kernelSize, rad, kernelData);
        } else {
            foregroundPixels += inner_loop<kind, false>(*itIn, *itOut, kernelSize, rad, kernelData);
        }
        checkProgress(size);
    }
    progressListener.notify();

    return foregroundPixels;
};
```

```
// Rows:
runLoop(width, kernelWidth, rows(imageIn), rows(imageAus));

// Columns:
return runLoop(height, kernelHeight, cols(imageAus), cols(imageOut));
```

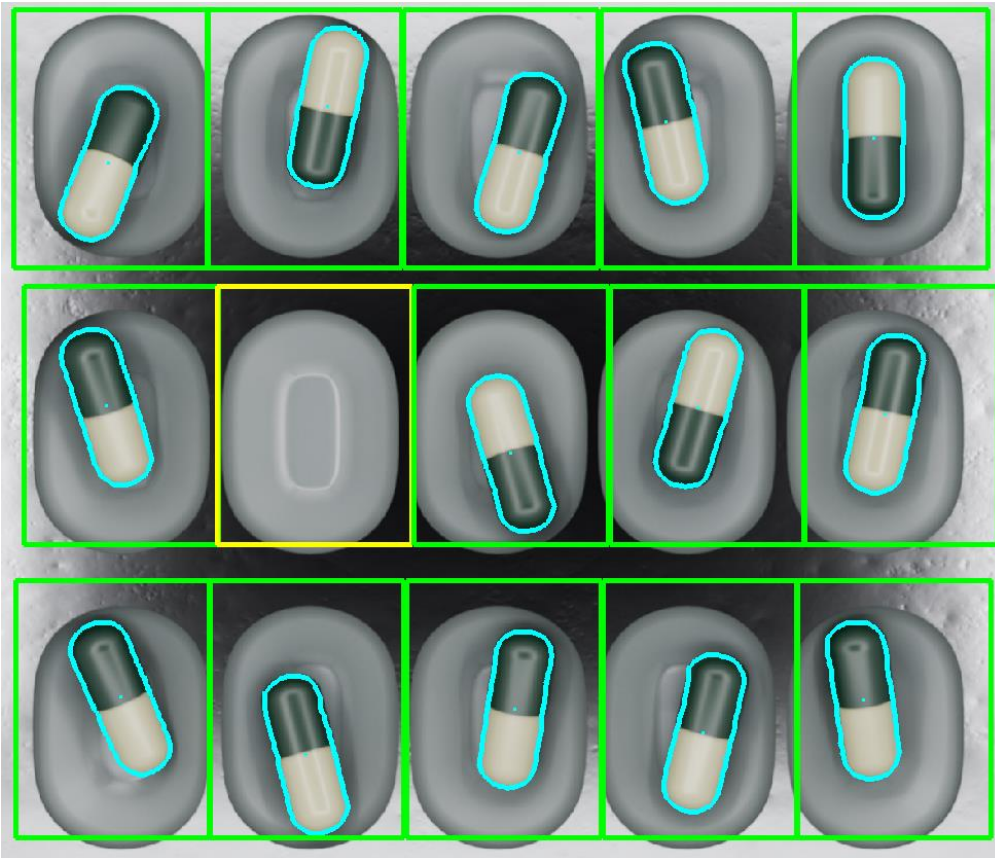
erosione generica  
per direzione

erosione per riga

erosione per colonna



# Beneficio -> Facilità d'uso per il cliente



## Pre-Neural

### 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

## Neural

### Operations of this Measure

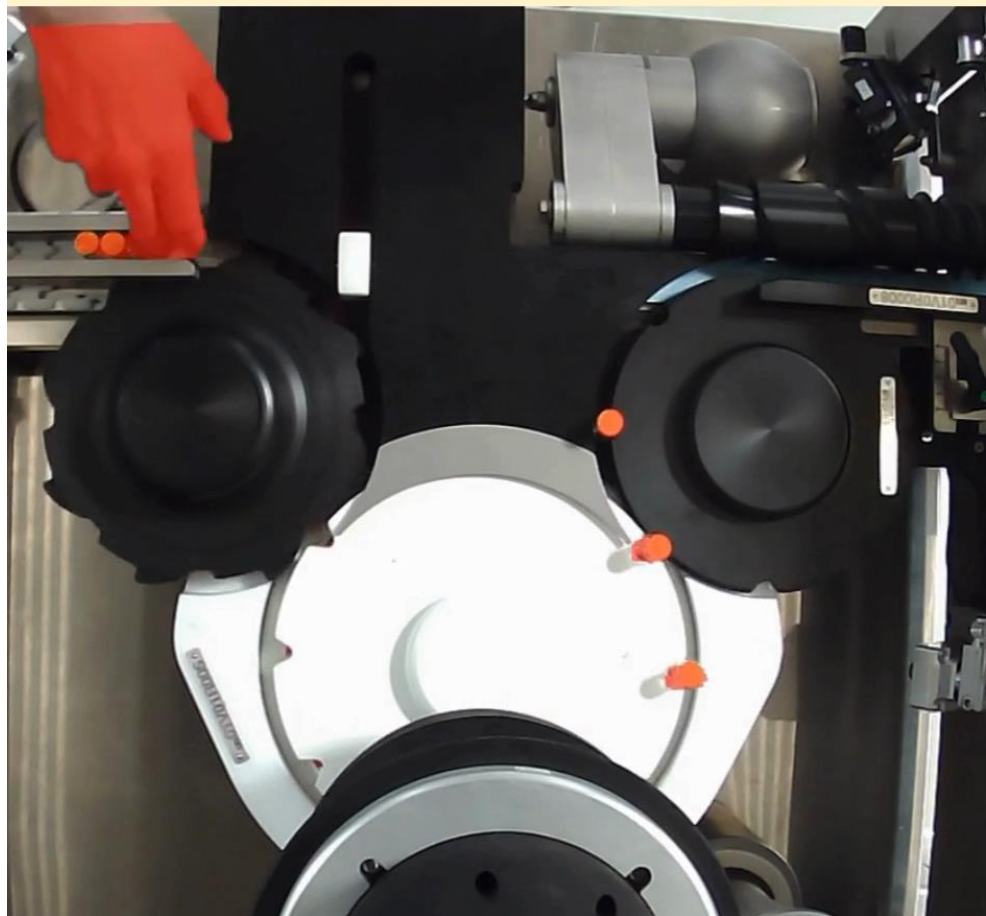
- 1 application of the region of interest: the whole window
- 2 segmentation with argo vision graph
- 3 filter semantic components



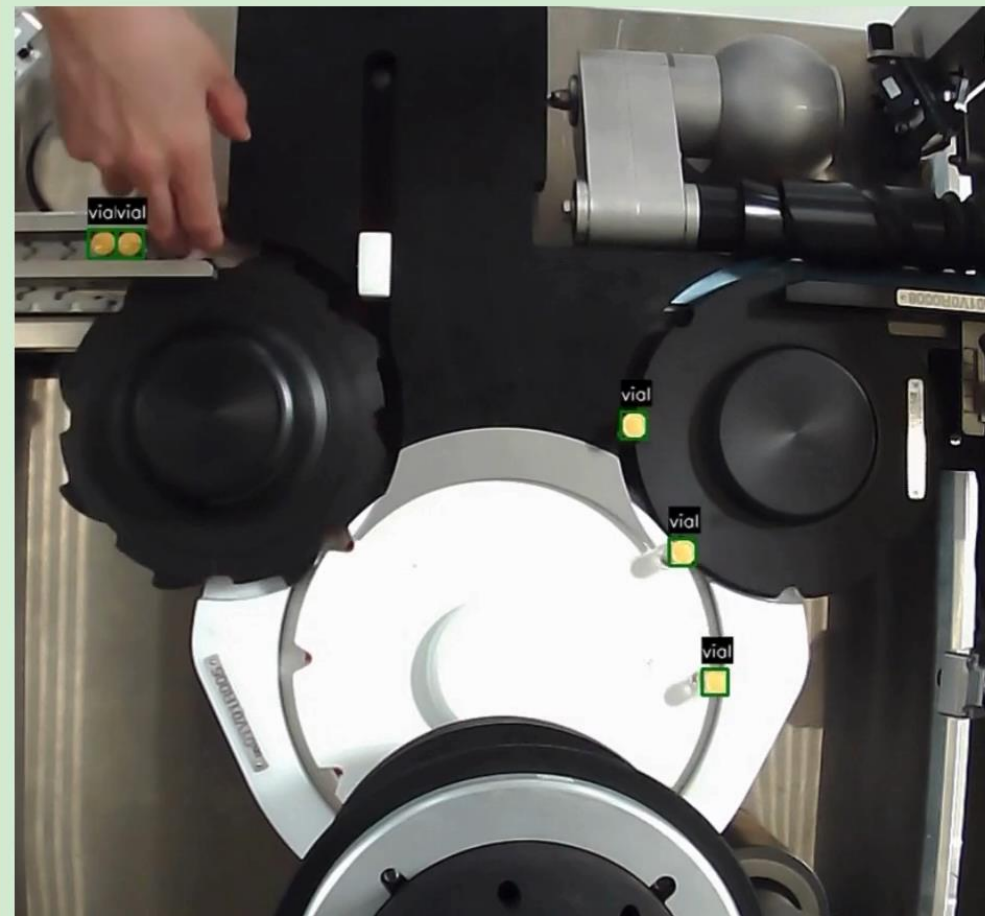
# USE CASE # 2



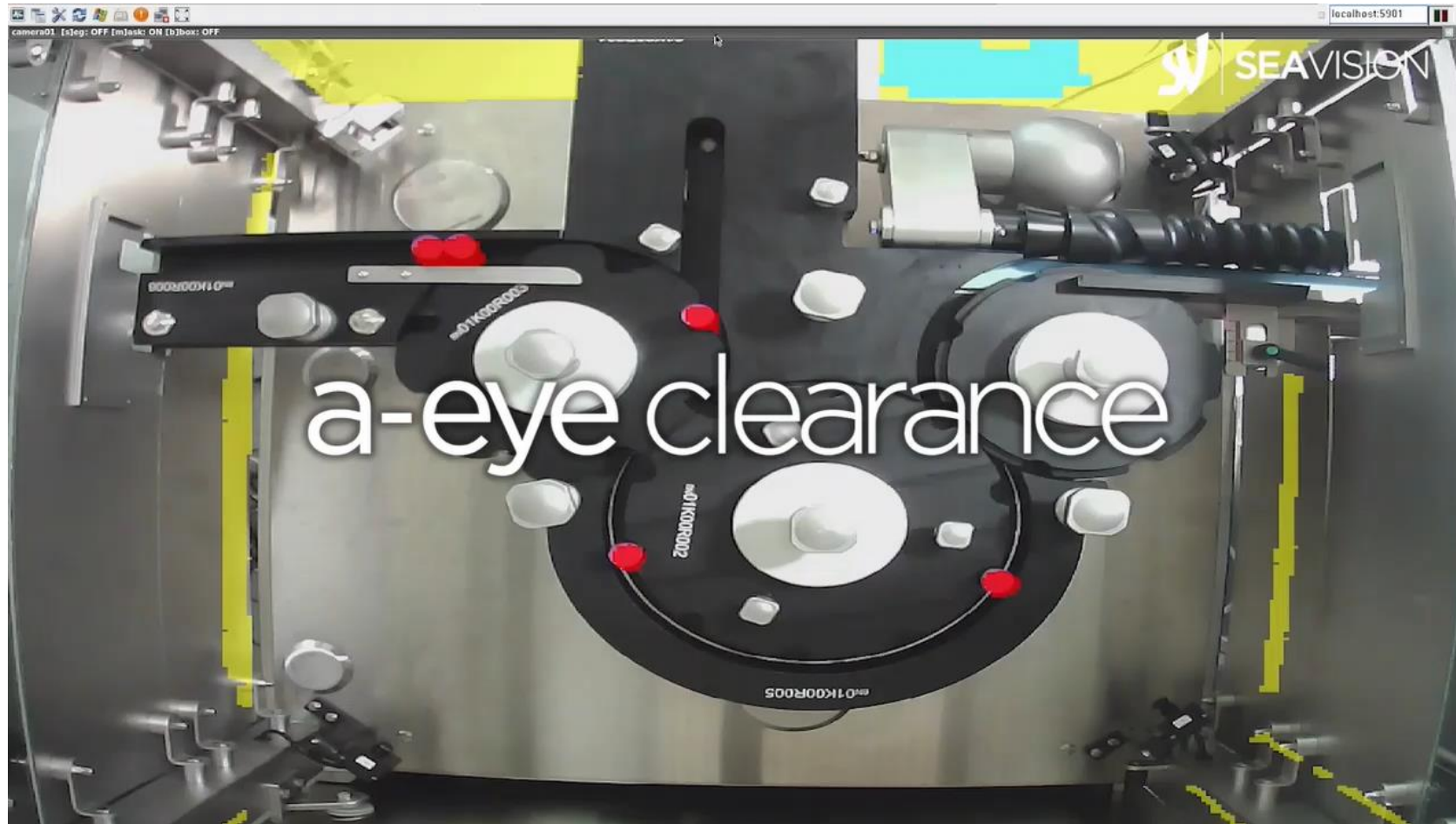
## Anomaly Detection



## Object Detection



# Beneficio -> Riduzione errore e tempi cambio formato



# USE CASE # 3

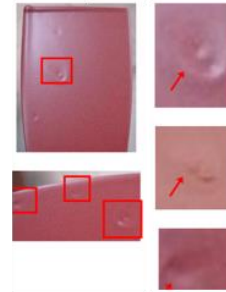
Stains



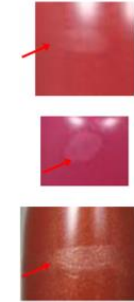
Logo Defects



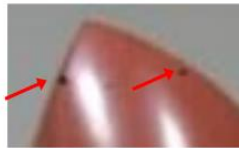
Blister



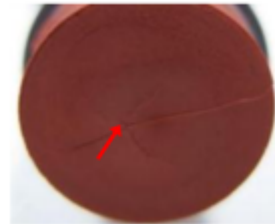
Scuffs



Pinholes



Craks



Tilt

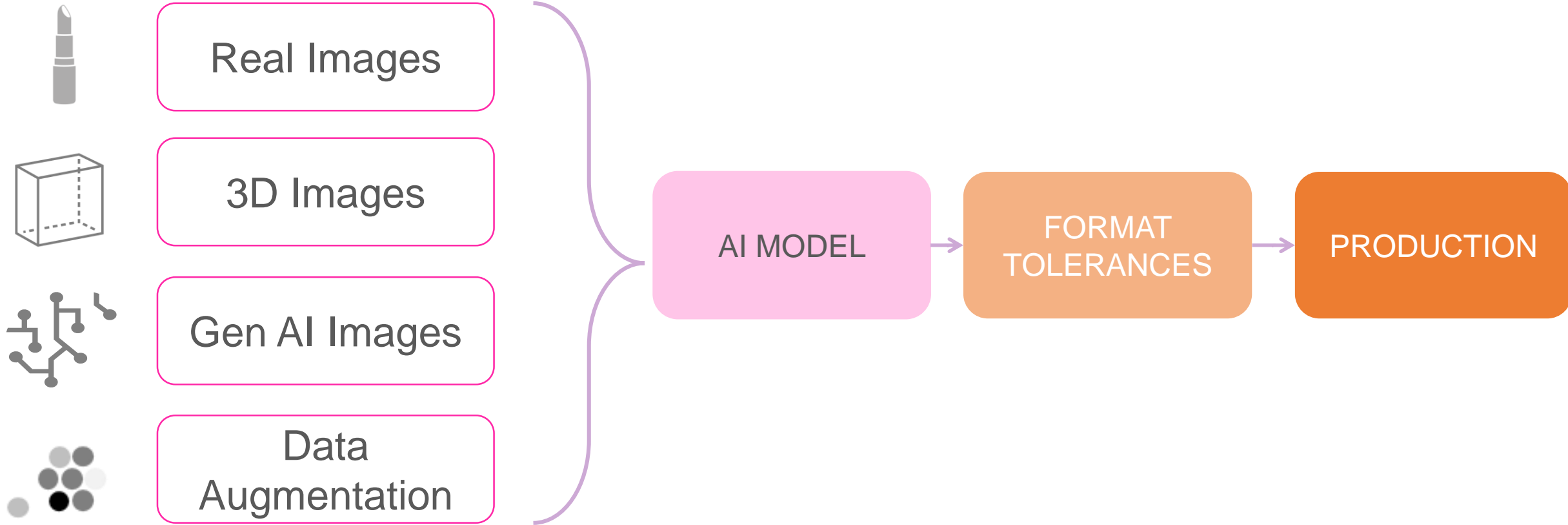


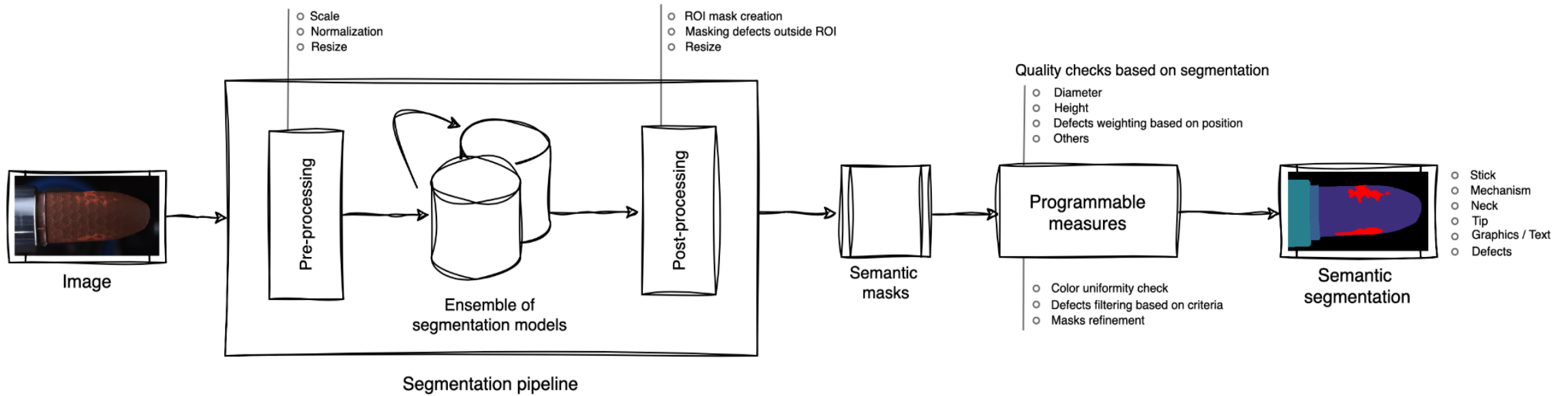
Scratches



Surface







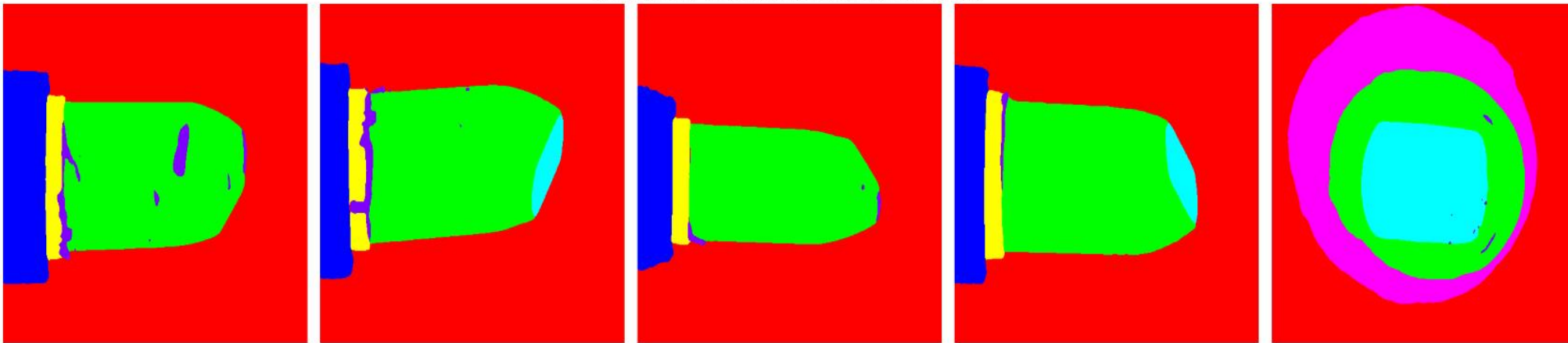
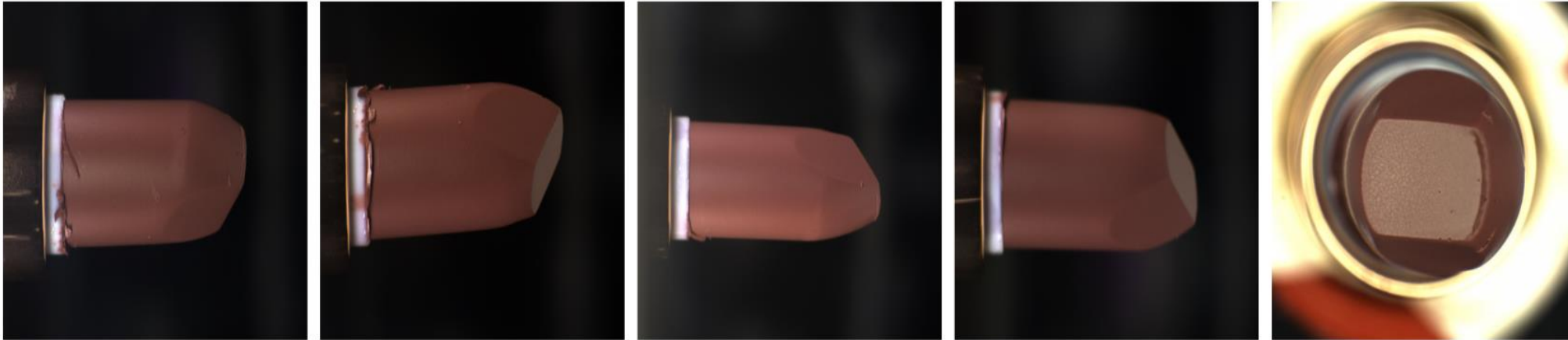
A **deep learning** model trained in supervised mode (minimizing error between prediction and ground-truth)

AI MODEL

FORMAT TOLERANCES

Operators can modify these parameters

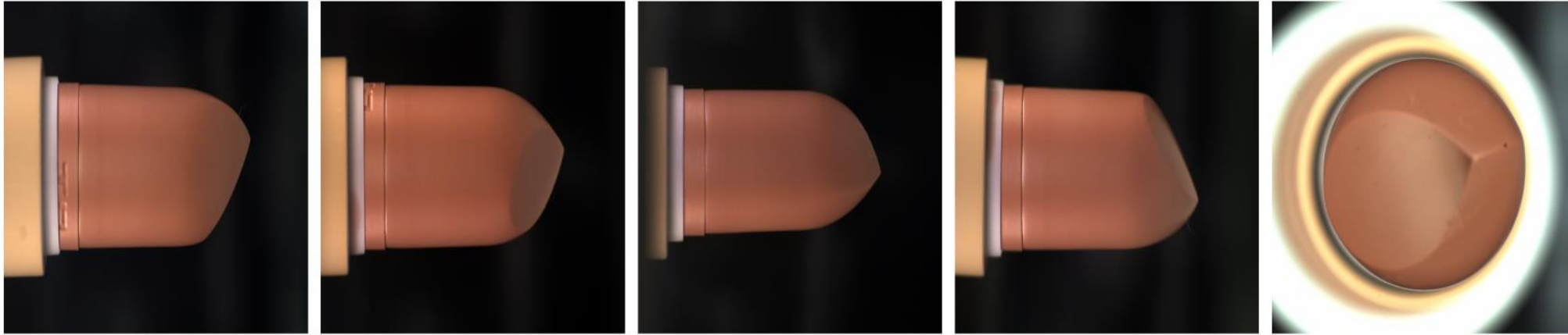
# Bave, graffi e fori



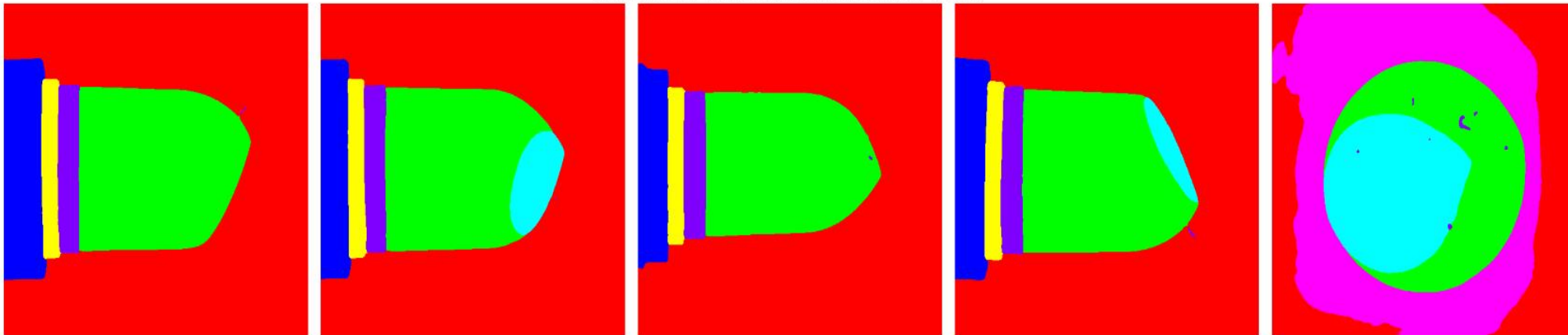
- background
- stick
- neck
- mechanism
- neck-mechanism
- tip
- decorations
- defects



# Difetti sul colletto



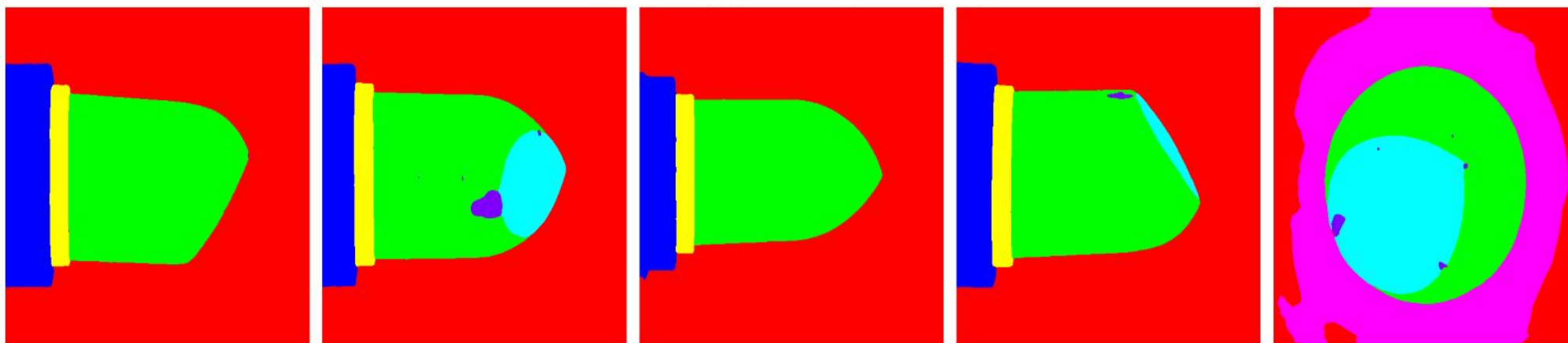
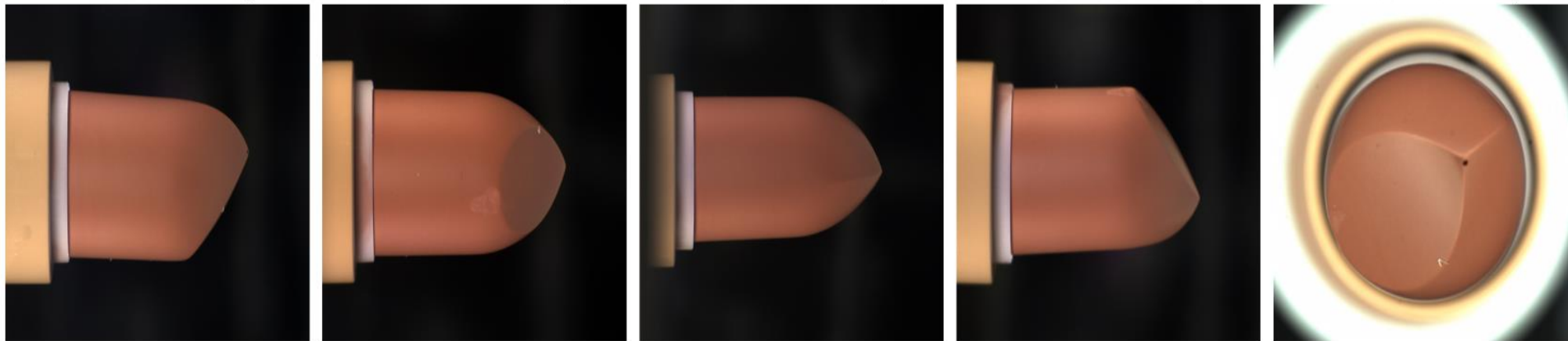
v24.0.1/0023r (single-defect-class) zoom 1.5 (ONNX)



- background
- stick
- neck
- mechanism
- neck-mechanism
- tip
- decorations
- defects



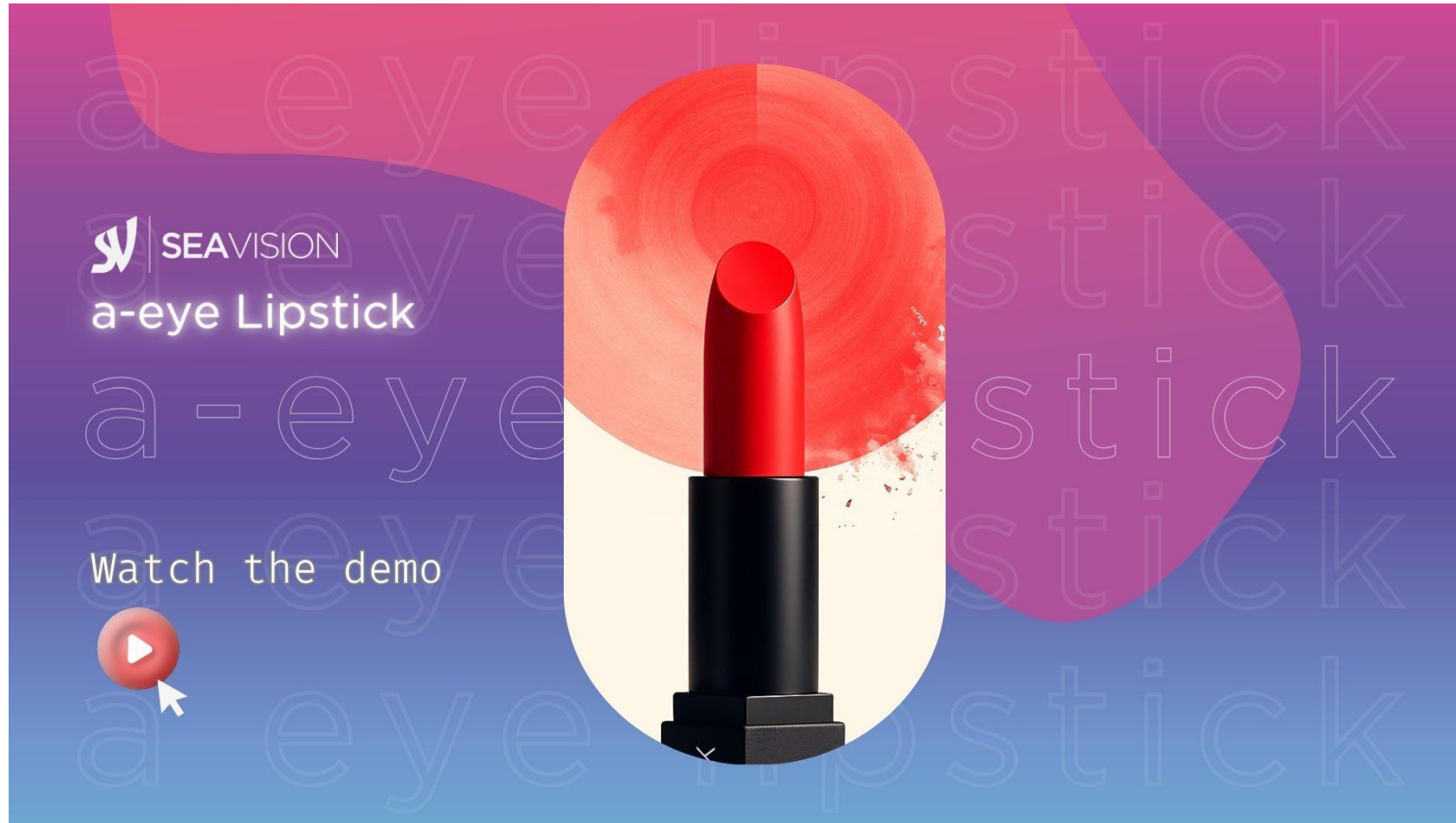
# Alonature

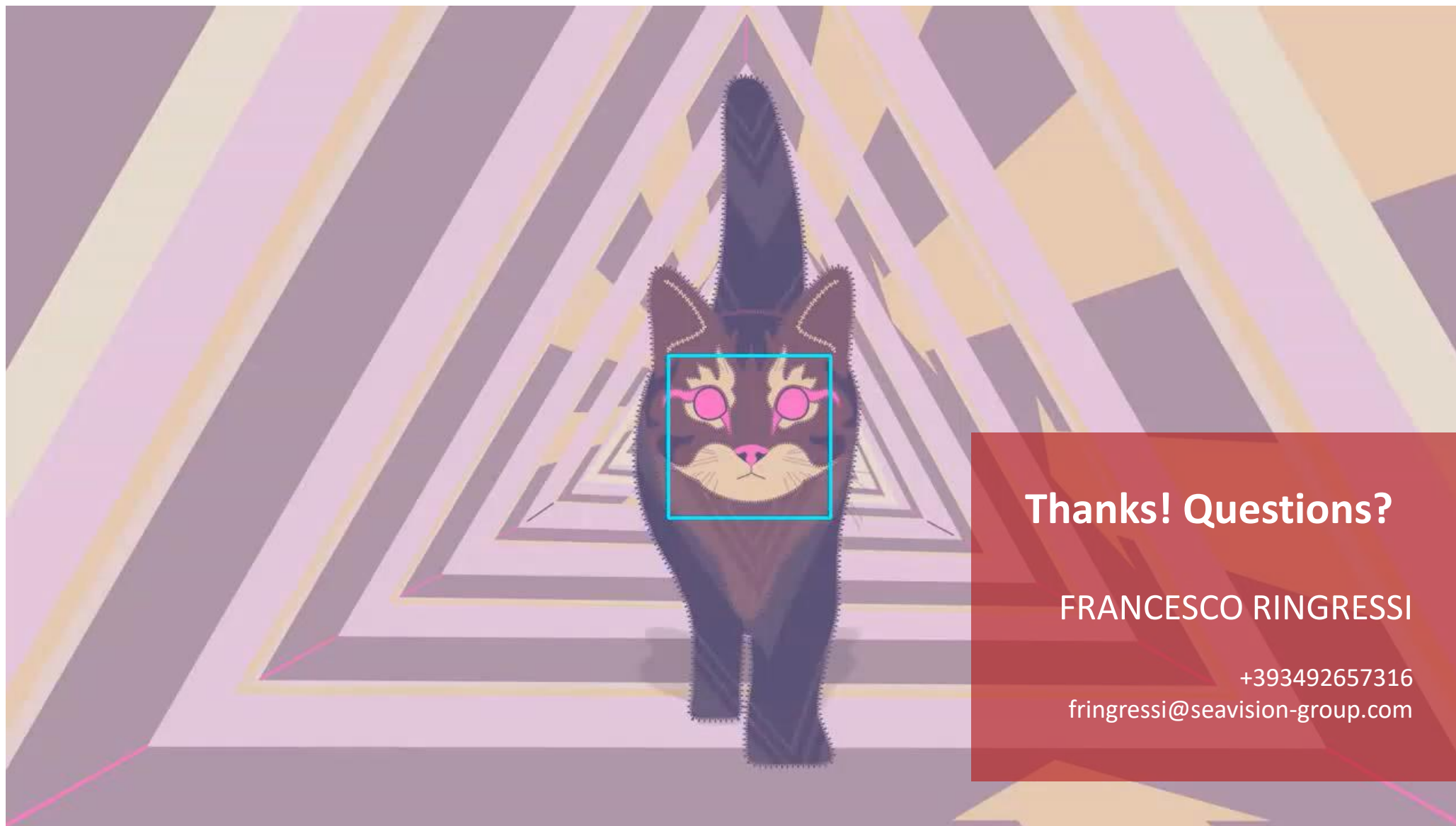


- background
- stick
- neck
- mechanism
- neck-mechanism
- tip
- decorations
- defects



# Beneficio -> 100 % ispezione automatica e garantita





**Thanks! Questions?**

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