Eye Vision Technology

EyeVision Software

The ultimate machine vision solution

Platform freedom **Unmatched performance** **AI – driven intelligence**

End-to-end machine vision expertise - simple, adaptable, and ready for any application!

Comprehensive Imaging
1D, 2D, 3D, Thermal, SWIR & Hyperspectral technologies

AI & Robotics
Deep learning, automation & robot vision solutions

Simple & Adaptable
Drag & drop programming, cross-platform & hardware flexible

25+
YEARS OF EXPERIENCE

58.237+
SOLD LICENSES

Agenda

Platform Independence: Any OS, any architecture

EyeVision offers flexibility by supporting a broad spectrum of operating systems and CPU architectures, freeing customers from hardware constraints and ensuring future-proof investments.

x86 (Intel, AMD)

Microsoft Windows

Standard architecture for PCs and servers

ARM (32/64Bit)

LINUX Android (Optional)

Popular for embedded systems and mobile devices

MIPS

LINUX

Used in specialized networking equipment

Key Benefits

Investment Protection
Choose hardware based on project requirements rather than software limitations

Hardware Freedom
Not locked into specific hardware, allowing cost-effective solutions

Future-Proof
Compatible with upcoming hardware technologies and standards

Platform Flexibility
Run consistent vision code across different hardware platforms

Supported hardware

Embedded & Smart camera support

EyeVision seamlessly integrates with a diverse range of hardware platforms, from compact embedded systems to advanced smart cameras, enabling powerful vision solutions across various scales and environments.

Embedded systems support

- Raspberry PI, Banana PI, ODROID,…
- Other ARM/MIPS-based systems
- PC-based embedded (ODROID, NUC)

Raspberry PI with I/O Module

Smart camera support

- Standard smart cameras (SensoPart, Baumer)
- Ready for upcoming AI Smart Cameras
- Internal AVT models (coming soon)

EyeCheck – smart camera solution

Key Benefits

Universal Platform
Same EyeVision software works from low-power devices to high-end PCs

Simplified Development
Consistent API and tools across all supported hardware

Performance Optimization
Hardware-specific optimizations for optimal processing

Hardware Independence
Focus on application development, not hardware constraints

Multi-camera connectivity

EyeVision offers robust multi-camera support, allowing integration of as many cameras as your system's bus infrastructure can accommodate. This flexibility is essential for building comprehensive, multi-view inspection systems that require data from various angles or different camera types simultaneously.

EyeVision

USB 3 — UNIVERSAL SERIAL BUS
Common and versatile for many applications

GiGE VISION
High-speed Ethernet for industrial environments

CoaXPress
High-performance for high-speed, high-resolution cameras

CAMERA Link
Standard for high-speed digital cameras

Key Benefits

Comprehensive Coverage
Supports virtually any industrial camera setup

High-Speed Acquisition
Captures data from multiple cameras simultaneously and fast

Synchronized Processing
Coordinated capture for multi-view inspection

System Integration
Easily integrates with existing infrastructure

EyeVision Software – universal machine vision platform

Enables zero-error production – with high speed inspection, improving quality control.
Easy to install, customize, and extend with drag-and-drop features. – No programming only drag and drop to inspection solution.

1D / Line scan cameras

Endless material – woven and non woven
Precise Error detection

2D Grey & Color Cameras

Key match, correlation, OCR, histogram analysis, color filter, edge detection

3D Sensors

3D contour check, 3D key point match, 3D measurement, 3D bin picking

Thermal Cameras

Thermo sequence capture, thermo measure, Impulse and Lockin, thermal reading

SWIR / Hyperspectral

Hyperspectral analysis, moisture detection, spectral reading

Deep Learning

Object detection, image segmentation, classification, anomaly detection

Robot Vision

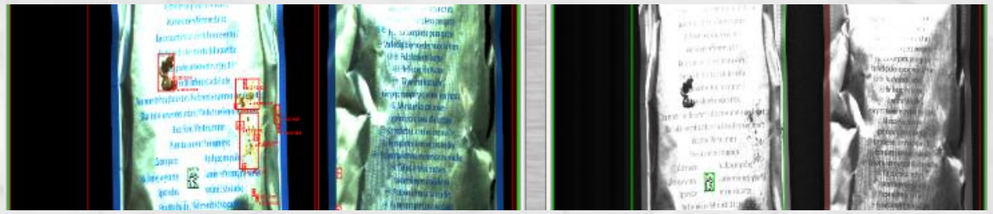
Hand-eye calibration, robot communication, Absolut calibration

One platform, unlimited applications

EyeVision integrates all these technologies in one unified solution

1D & 2D Vision Application

1D Vision Technology



Surface inspection

Detecting defects and blemishes on surfaces

Line segmentation | Edge detection

Dimension Measurement

Precise measurement of object dimensions

Measure gap width | Caliper

Pattern Matching

Identifying specific patterns and features

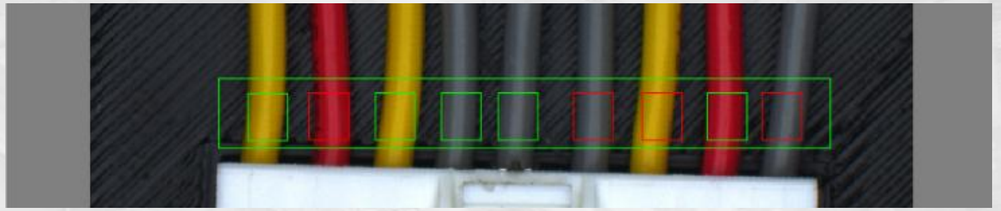
Key match | Correlation

Code reading

OCR/DMC code interpretation

OCR | Count objects

2D Vision Technology



Surface inspection

Comprehensive 2D surface defect detection

Edge detection | Histogram analysis

Dimension measurement

Mult-dimensional object sizing

Distance measurement | Key match

Pattern matching

Complex pattern recognition

Correlation | Key match

Object detection

Identification and classification

Object detection | Color filter

Color detection

Color based object detection

Color filter | Histogram analysis

Code reading

QR codes, barcodes and characters

QR Code | Barcode

3D Vision Solutions

EyeVision 3D applications

Surface topology

3D contour check for surface defects

Defect detection

Identifies defects in 3D models

3D Measurements

Height, depth and volume analysis

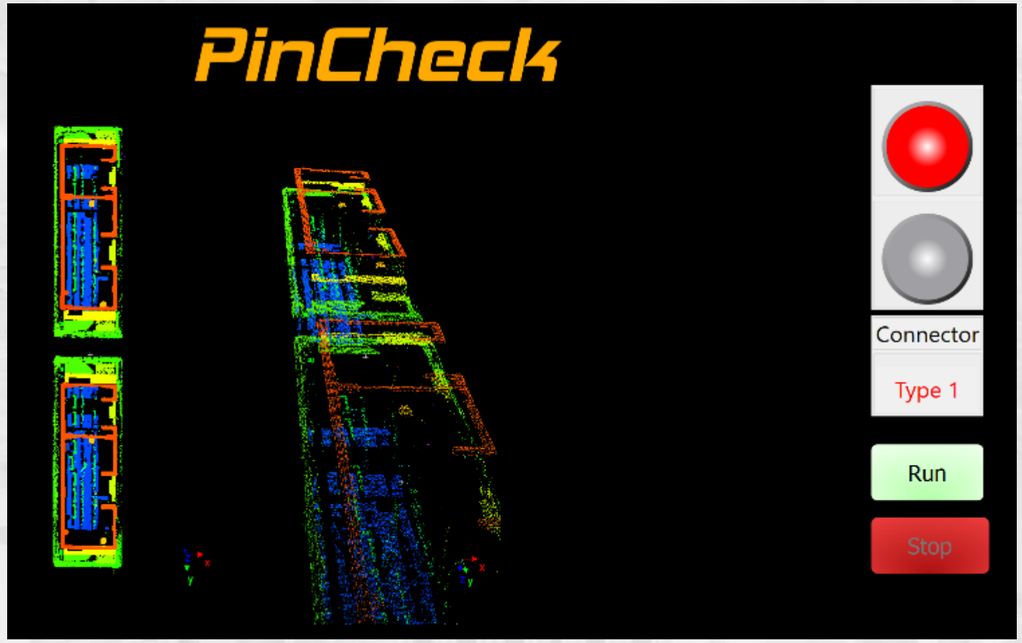
Object recognition

3D Key Point Match for identification

Other application examples

- 3D Bin Picking for robot guidance
- 3D geometry for complex shapes
- Weld, seam, glue, seal, gap inspection

PinCheck – 3D pin inspection solution



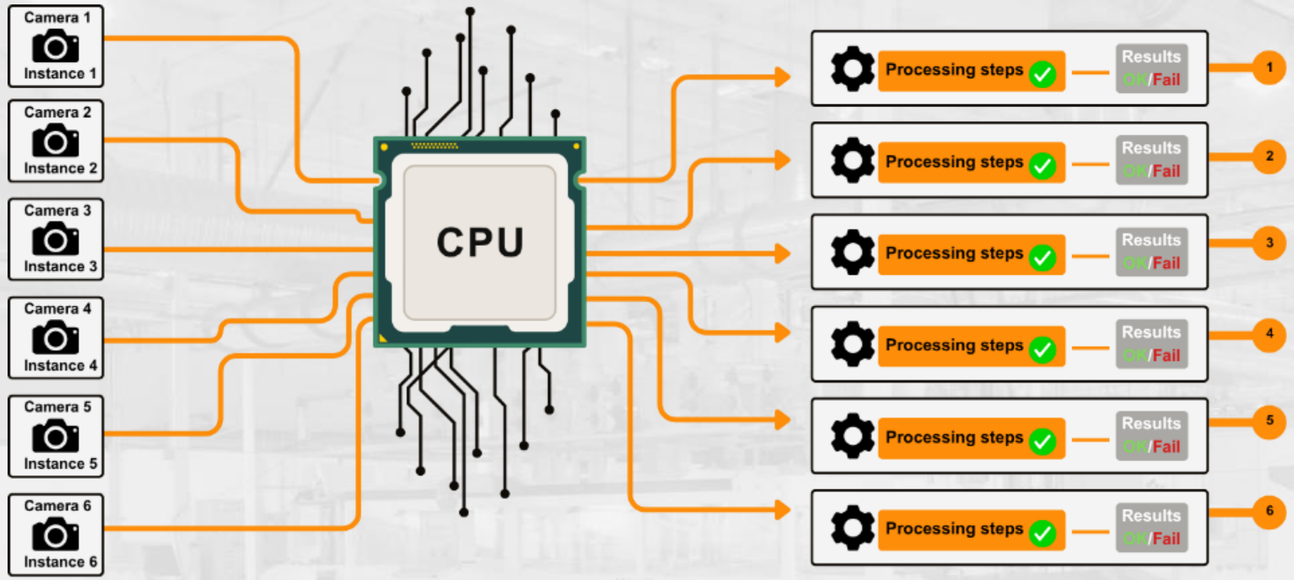
Key benefits

- Combines 3D data with 2D/1D inspection for complete quality control
- Enables accurate measurements without complex calibration
- Integrates seamlessly with PLC and HMI systems
- Cost-effective solution compared to specialized 3D vision systems

Multi-instance processing power

EyeVision provides advanced multi-instance support to maximize processing efficiency and throughput for demanding vision applications.

Per-Instance Parallel Processing



Pipelined Instances

Image Acquisition → Processing → Results

Dividing complex tasks across instances creates a processing pipeline.
One instance acquires images, another processes them, and a final instance consolidates results.

Key Applications

- **High-Speed Production:** Multiple products inspected simultaneously
- **Continuous Operation:** Overlapping processing stages for maximum throughput
- **Complex Inspection:** Dividing tasks for better resource utilization
- **System Integration:** Seamless integration with existing automation systems

High-speed performance

EyeVision is engineered for demanding, high-speed applications with specialized debugging support for environments processing 40+ parts per second.

Real-time Processing

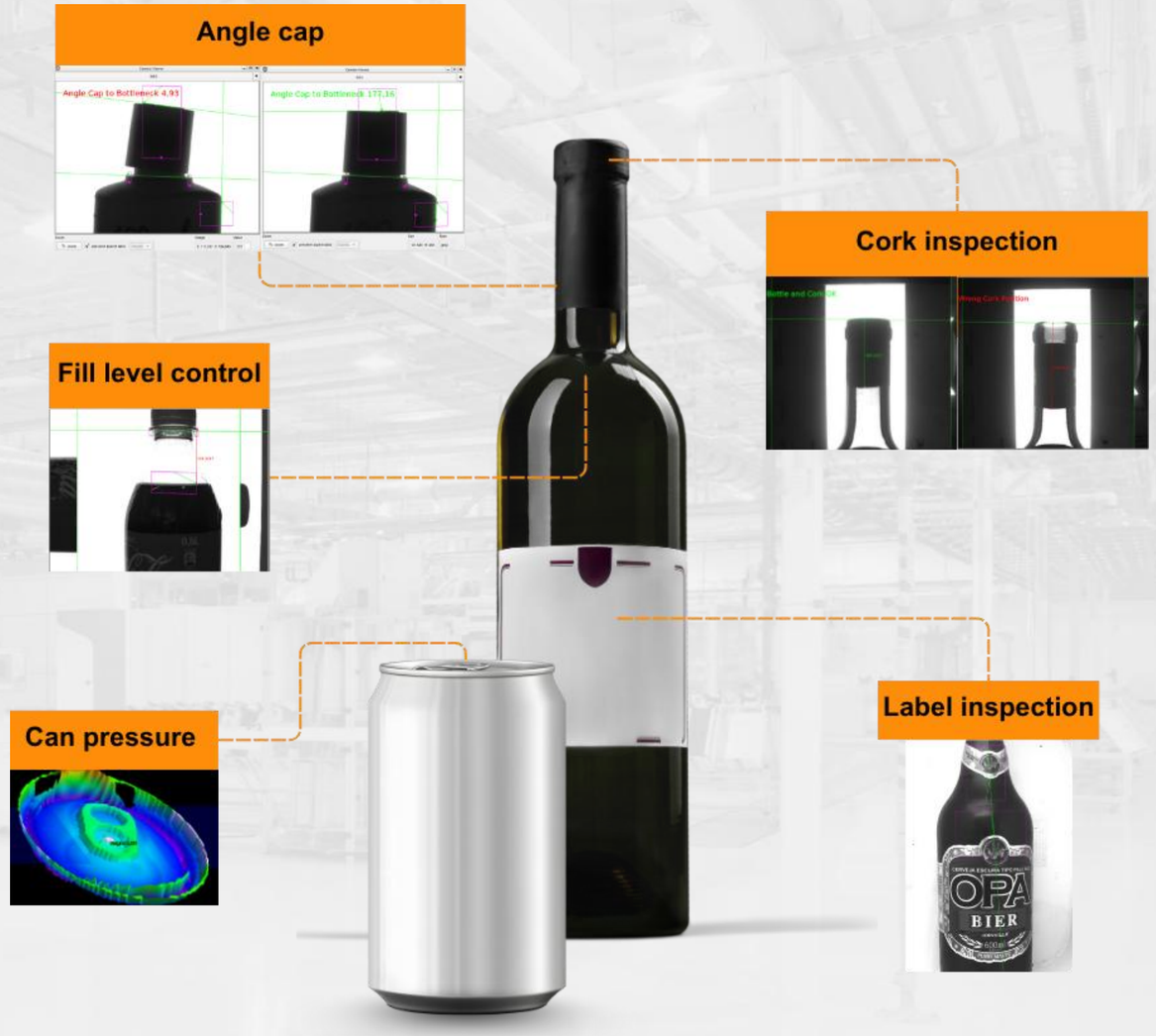
EyeVision provides high-speed debugging support for fast-paced industrial environments, allowing engineers to identify and resolve issues in real-time.

Performance Impact

Detailed insights into processing steps at high speeds help maintain peak performance and efficiency, directly impacting productivity and profitability.

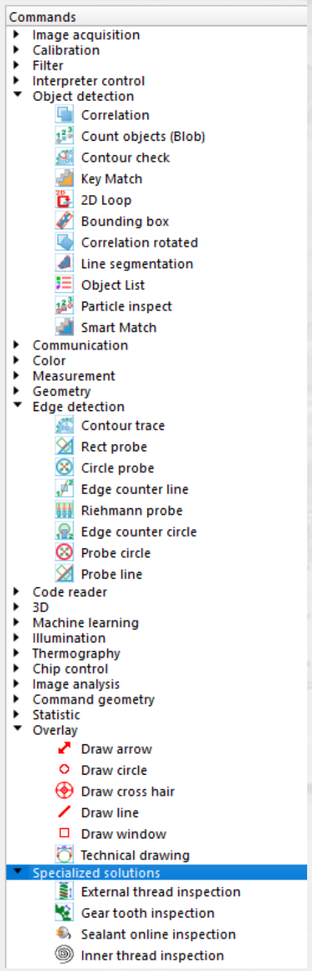
Key Benefits

- **Minimized Downtime**
  Quick issue resolution
- **Continuous Operation**
  Real-time monitoring
- **Detailed Insights**
  Processing step analysis
- **Precise Diagnostics**
  High-speed troubleshooting



Powerful command library

EyeVision boasts a powerful library of over 380 functions, providing diverse tools for machine vision applications with a flexible "pay-what-you-need" pricing model.



Pay-What-You-Need Pricing

License functions at a granular level based on your specific project requirements.

- Pay only for what you use, avoiding unnecessary expenses

Key Benefits

Cost-Effective
Pay only for required functions

Modular Flexibility
Scale solutions as needs evolve

Comprehensive Tools
Over 380 functions available

Future-Ready
Add new functions as needed

Built-in AI Suite

EyeVision integrates a comprehensive AI toolset, enabling deep learning implementation without separate platforms or specialized expertise.

Integrated Annotation Tools

Efficient labeling of data to prepare for AI model training, streamlining the data preparation process.

Integrated Training

Train custom AI models directly within the EyeVision environment, eliminating the need for specialized platforms.

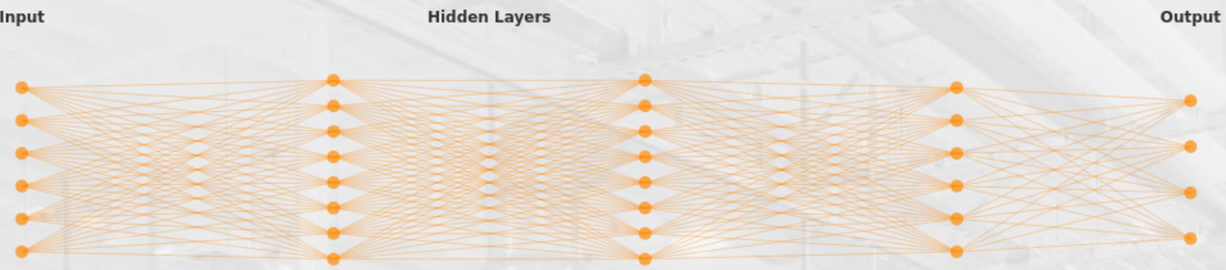
Integrated Transfer Learning

Adapt pre-trained models to specific requirements, reducing development time and data needs.

Ready-to-Use Networks

Pre-trained models that can be deployed immediately or fine-tuned for specific tasks.

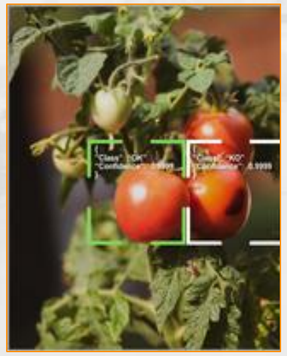
AI & Deep learning integration



EyeVision's deep learning architecture enables AI-based inspection and classification

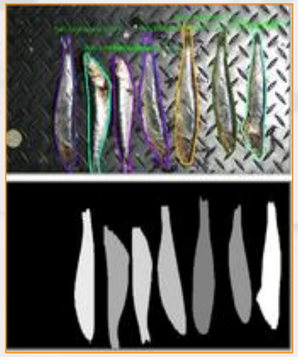
Automated defect detection

AI-powered detection of defects in products that traditional methods miss.



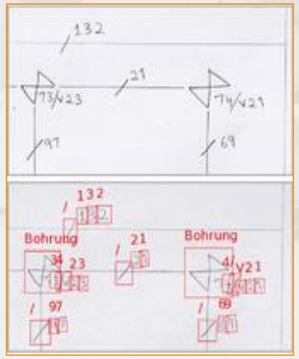
Object classification

Classifies and sorts objects based on learned features with high accuracy.



Advanced OCR

Reads complex codes and text with superior accuracy even in poor lighting.



Anomaly detection

Identifies rare defects or variations that indicate quality issues.

Classification

What can we see in this image?

Screw

Object detection

What is in the image and where?

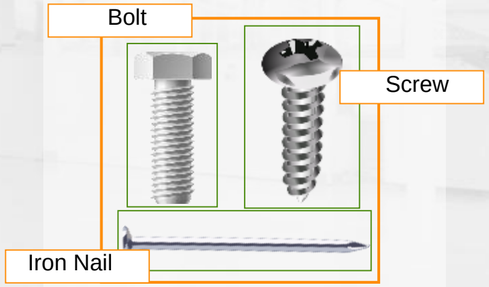
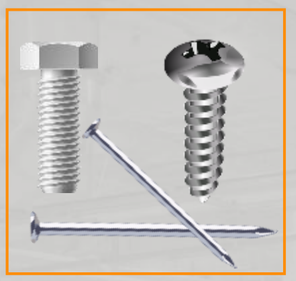
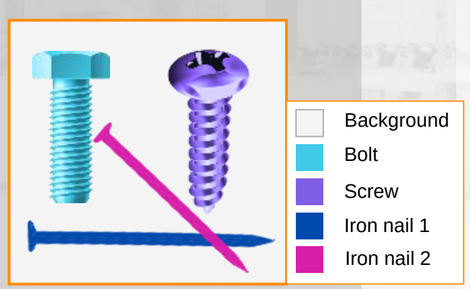


Image Segmentation

Which pixel belongs to which object?



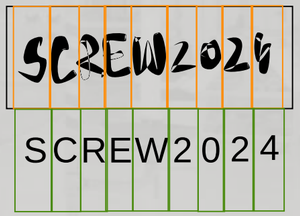


Anomaly detection

How to find the error?

OCR

How to generate text?



ASCII*

Broad AI Acceleration Support

EyeVision supports a wide range of AI acceleration hardware, enabling real-time inference with maximum throughput and efficiency.

NVIDIA

High-performance GPUs for demanding AI tasks.

AMD

AI acceleration for embedded and desktop systems like MI450-GPUs

CORAL

Edge TPU for embedded and PC systems.

HAILO

AI acceleration for embedded and PC systems. Also supports e.g. NXP

Key Benefits

Maximized Throughput
Dedicated processing power for real-time AI inference

Enhanced Efficiency
Optimized performance for complex AI models

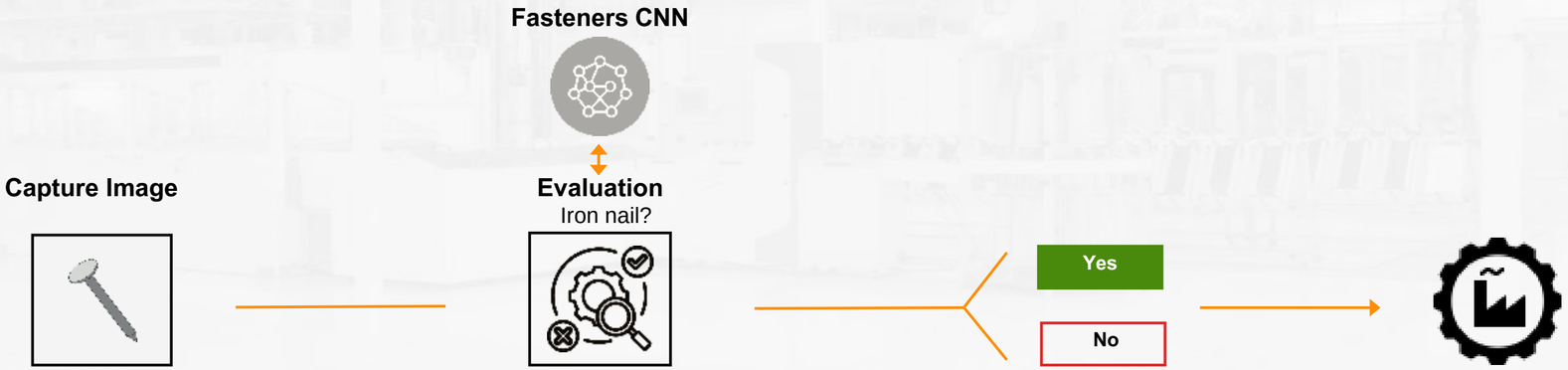
Platform Flexibility
Support for diverse hardware across embedded and enterprise systems

From Product Test to the AI Solution

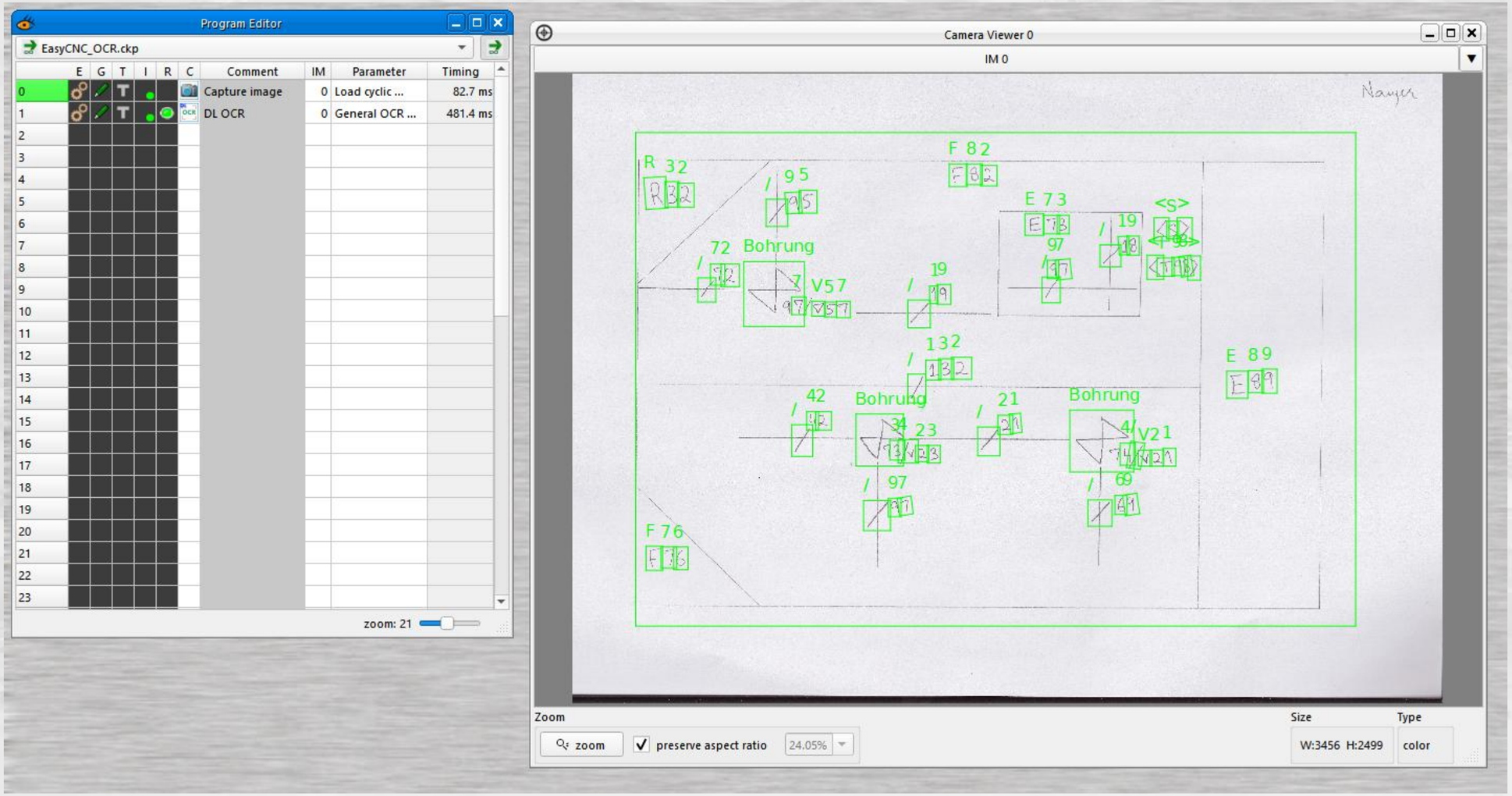
Unknown inspection task

Transfer Learning

Ready To Use

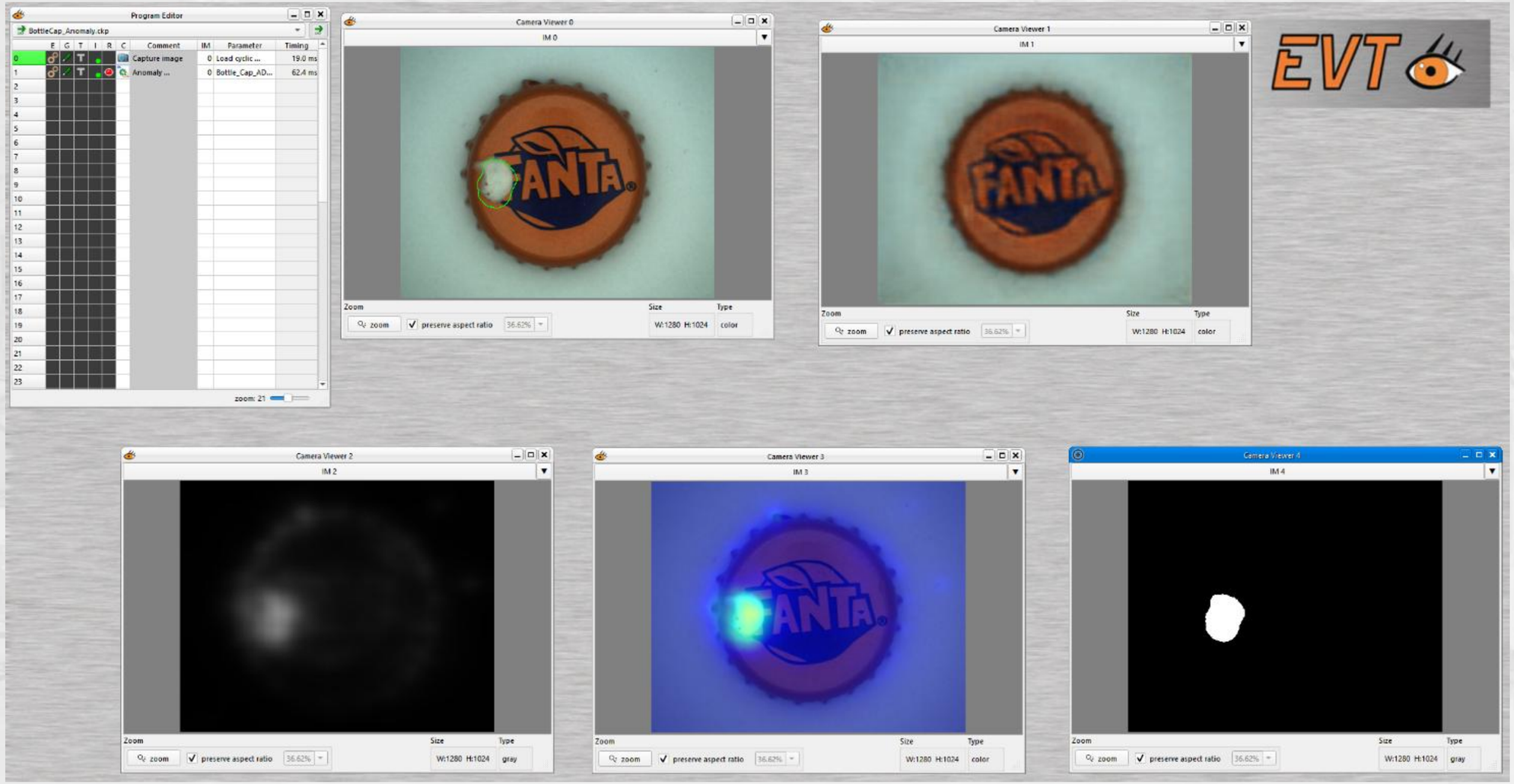


Handwriting on Workpiece



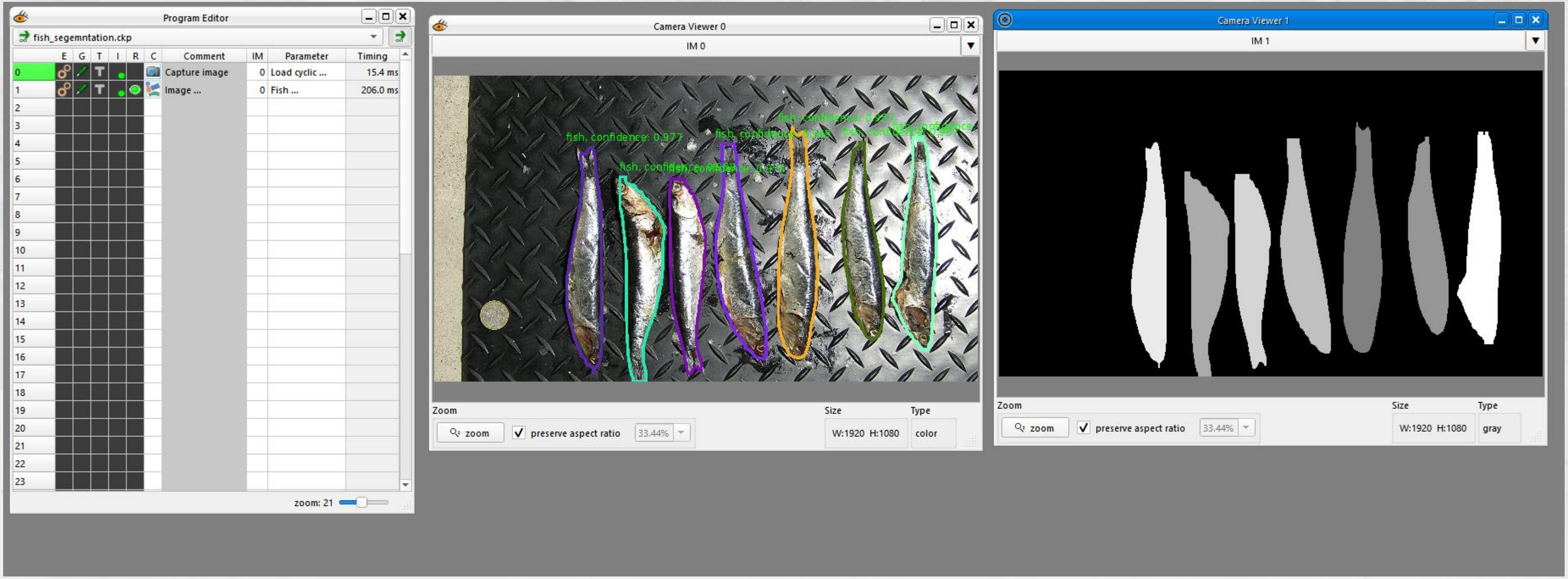
Project link: https://download.evt-web.com/fileadmin/downloads/special_releases/DemoProgs/DL_EasyCNC_OCR.zip

Anomality detection on surface



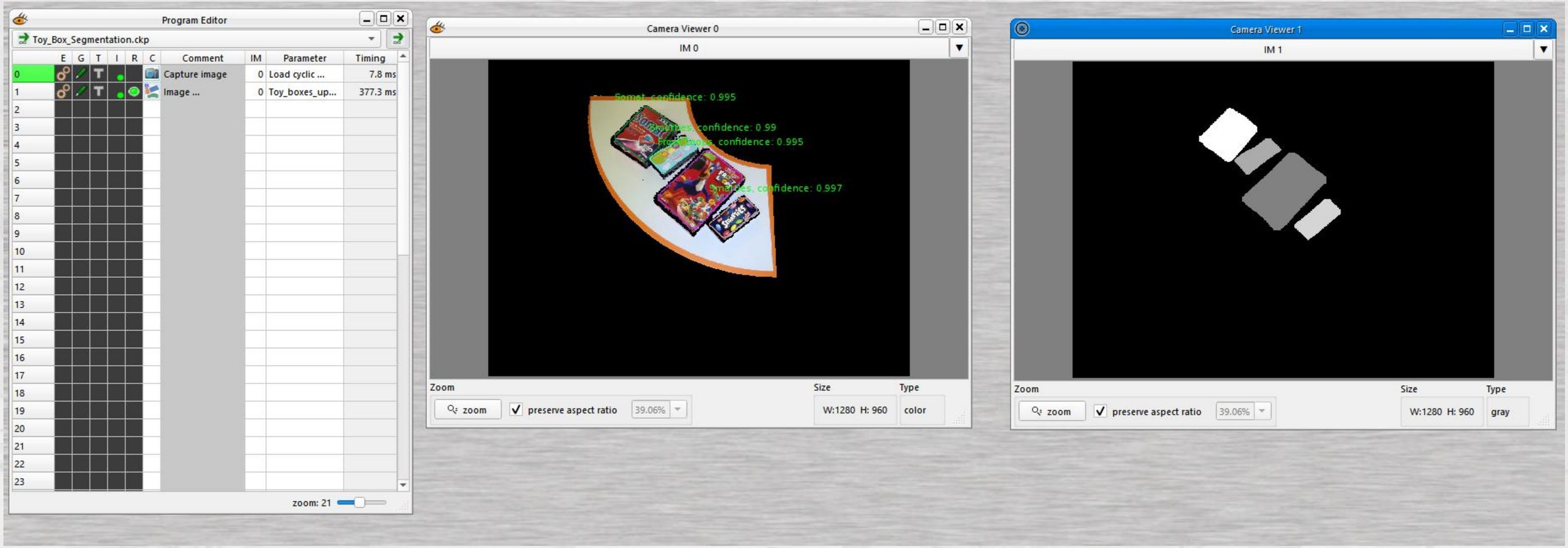
Project link: https://download.evt-web.com/fileadmin/downloads/special_releases/DemoProgs/DL_BottleCapAnomaly.zip

Object segmentation



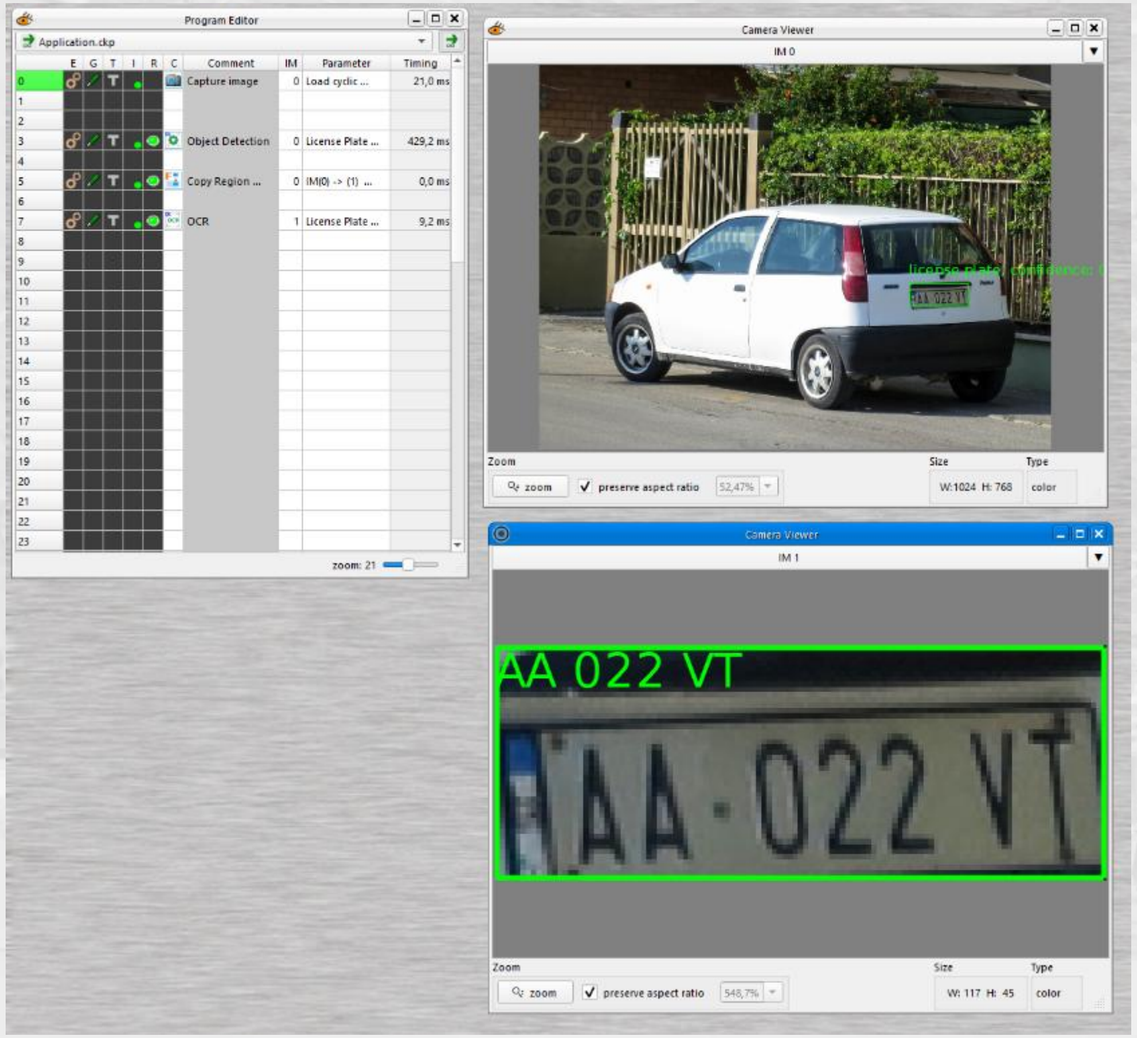
Project link: https://download.evt-web.com/fileadmin/downloads/special_releases/DemoProgs/DL_FishSegmentation.zip

Object segmentation and recognition



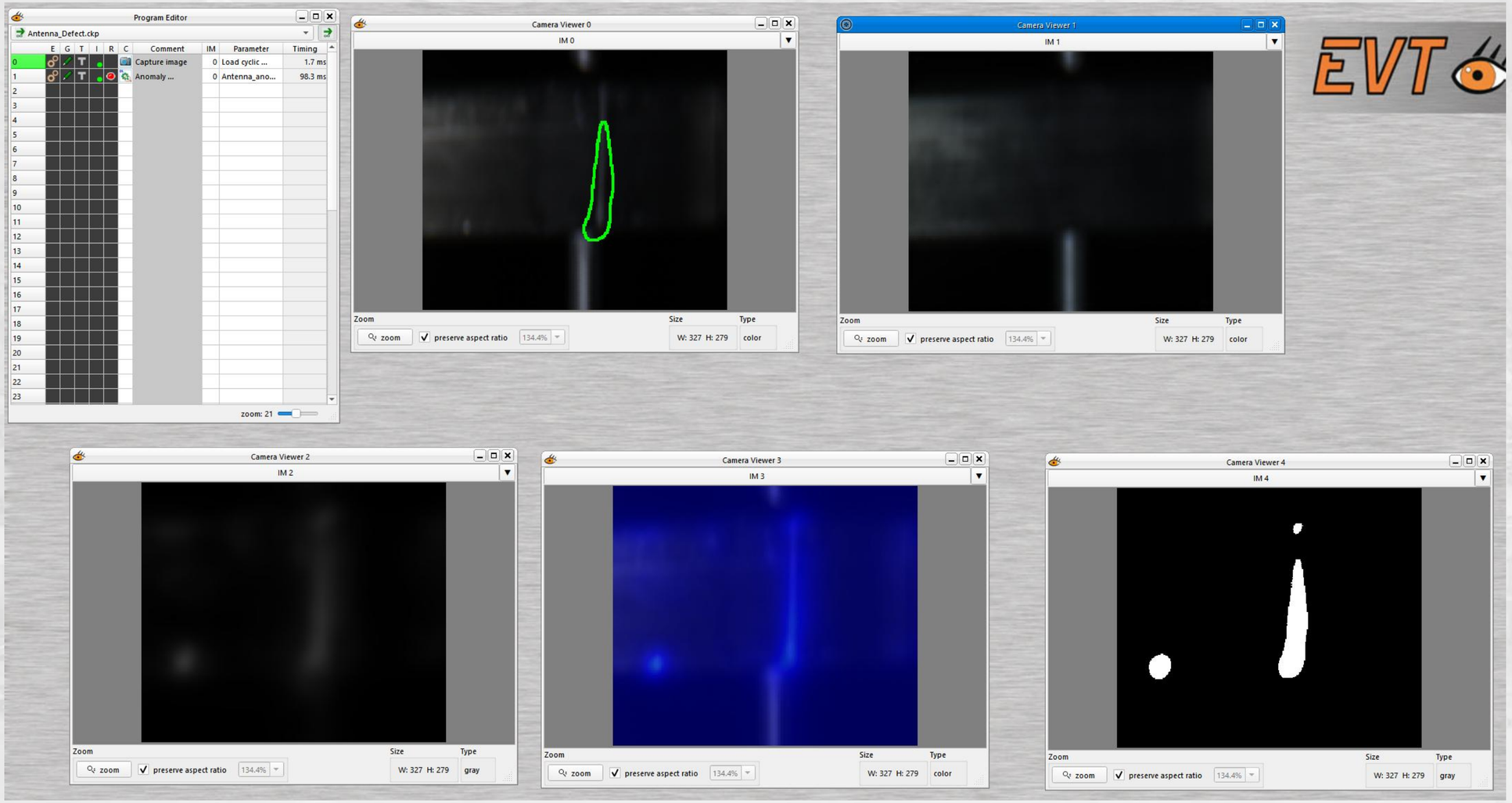
Project link: https://download.evt-web.com/fileadmin/downloads/special_releases/DemoProgs/DL_ToyBoxSegmentation.zip

Numberplate finder and reader



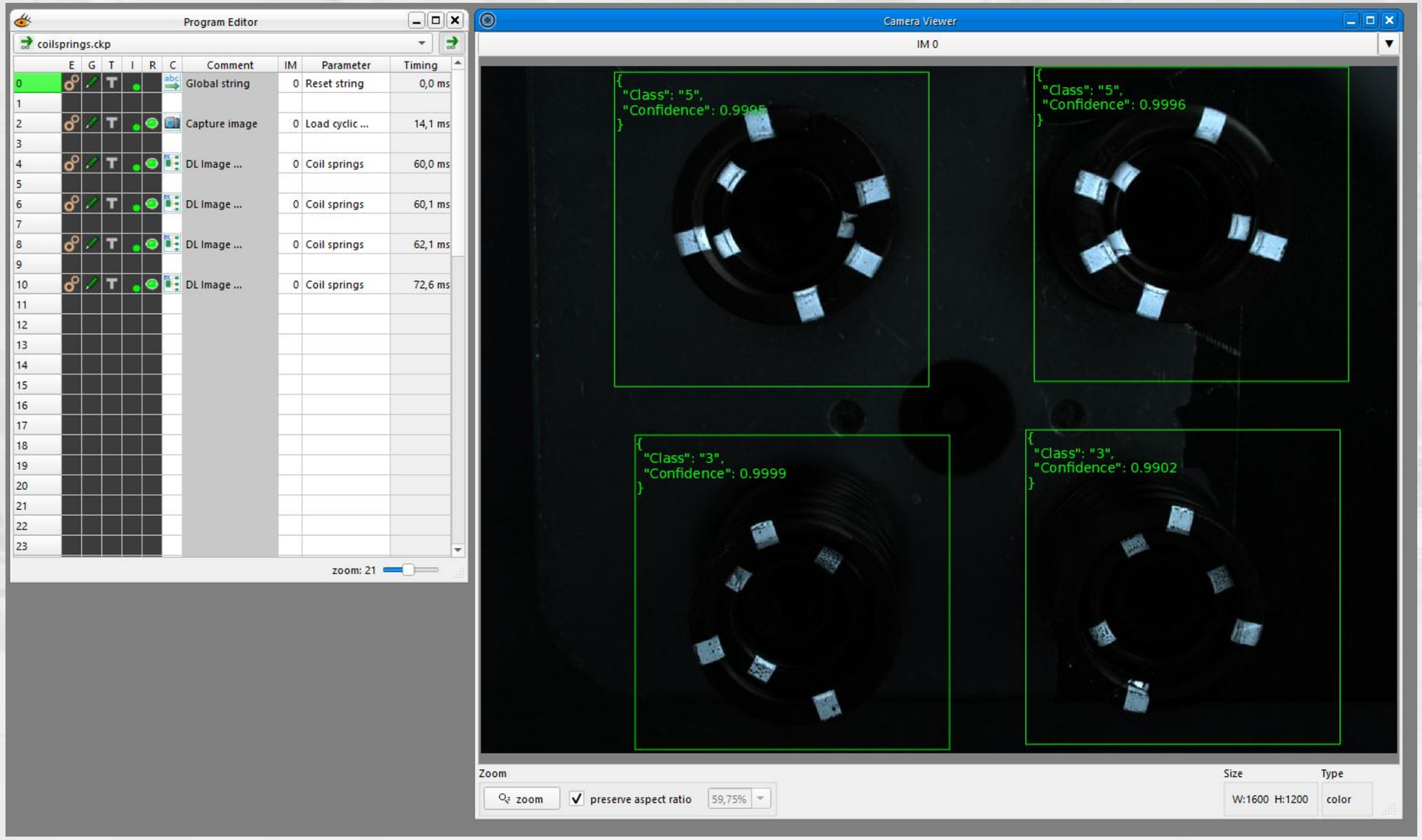
Project link: https://download.evt-web.com/fileadmin/downloads/special_releases/DemoProgs/DL_LP_reader.zip

Defects on metal surface



Project link: https://download.evt-web.com/fileadmin/downloads/special_releases/DemoProgs/OPTIMAI_EVT_Antenna_Defects.zip

Coil recognition



Project link: https://download.evt-web.com/fileadmin/downloads/special_releases/DemoProgs/DL_coilsprings_inspection.zip

Extensive SDK Integration

EyeVision offers comprehensive Software Development Kits (SDKs) for seamless integration with various systems, enabling robust communication and functionality extension.

Image Acquisition Control(VIC)

Enables easy integration with any capture hardware.

```
EV_VisionControl_Function()
```

PLC I/O

Enalbles integration of any I/O hardware

```
EV_PLC_WriteOutput()
```

NET I/O

Enables networking capabilities and remote system integration.

```
EV_NET_Connect()
```

Command Integration SDK

A unique feature that allows users to embed proprietary code directly into EyeVision's toolbox, enabling custom functions to appear as native commands with their own icons.

Modular Design
Add only the functionality you need

Custom Interface
Create tailored user experiences

Toolbox Integration
Seamless workflow with custom tools

IP Protection
Protect your proprietary algorithms by integrating your tools to the toolbox

Flexible Deployment Options

EyeVision offers versatile deployment options, enabling seamless integration into various operational environments while maintaining consistent functionality.

GUI & No-GUI Operation

- Runs with or without graphical interface // Headless
- Ideal for both user interaction and automated processes
- Integrated with OEM customer interfaces

Background Operation

- Runs in background mode without user interface
- Perfect for automated systems and batch processing
- Programmable via command line or scripts

Remote System Operation

- Runs as remote system on connected computers
- Compatible with various hardware platforms
- Enables centralized control and monitoring

Embedded & Standard Systems

- Runs on Raspberry PI, Banana PI, ODROID, ….
- Compatible with x86, ARM, and MIPS architectures
- Ideal for both compact and high-performance systems

EyeVision can be seamlessly integrated into existing systems, displaying images and controlling parameters directly from the OEM customer interface.

Unified User Experience

EyeVision Graphical User Interface

Consistent interface across platforms

Toolbox

Contains all available image processing and control commands categorized for easy access.

Program editor

Create test and debug inspection workflows using drag-drop programming without coding knowledge.

Camera/Image viewer

Real-time display of camera images, inspection results overlay, and data visualization.

Key benefits: Same interface on PCs, embedded systems, and smart cameras provides workflow and advanced training requirements.

Seamless robot integration

EyeVision enables robots to “see” and interact with their environment through advanced 2D/3D vision and seamless integration with robotic systems.

Core applications

- **Bin Picking:** Vision-guided grasping for unordered parts
- **Palletizing/Depalletizing:** Automated stacking with precise placement
- **Sorting:** Object classification and separation using vision
- **Path guidance:** Robotic welding and tracking with real-time feedback

Integration features

- **Easy Hand-Eye Calibration:** Streamlined camera-robot alignment for accurate pick-and-place and guidance tasks
- **Standard Robot Interfaces:** Compatibility with major robot communication protocols for broad interoperability
- **Automatic Axis Offset Correction:** absolute accuracy to any robot – eliminating even small robot error

Key Benefits

- Intuitive **hand-eye calibration** and **drag-and-drop** setup
- **Real-time adaptation** to changing environments
- 2D/3D vision support for diverse robot application
- **Enhanced precision**, **reduced setup time**, and **simplified integration process**

Advanced user management

EyeVision's Advanced Password Manager provides granular control over software access and functionality based on user roles, enhancing security and operational efficiency.

Operator (MA1)

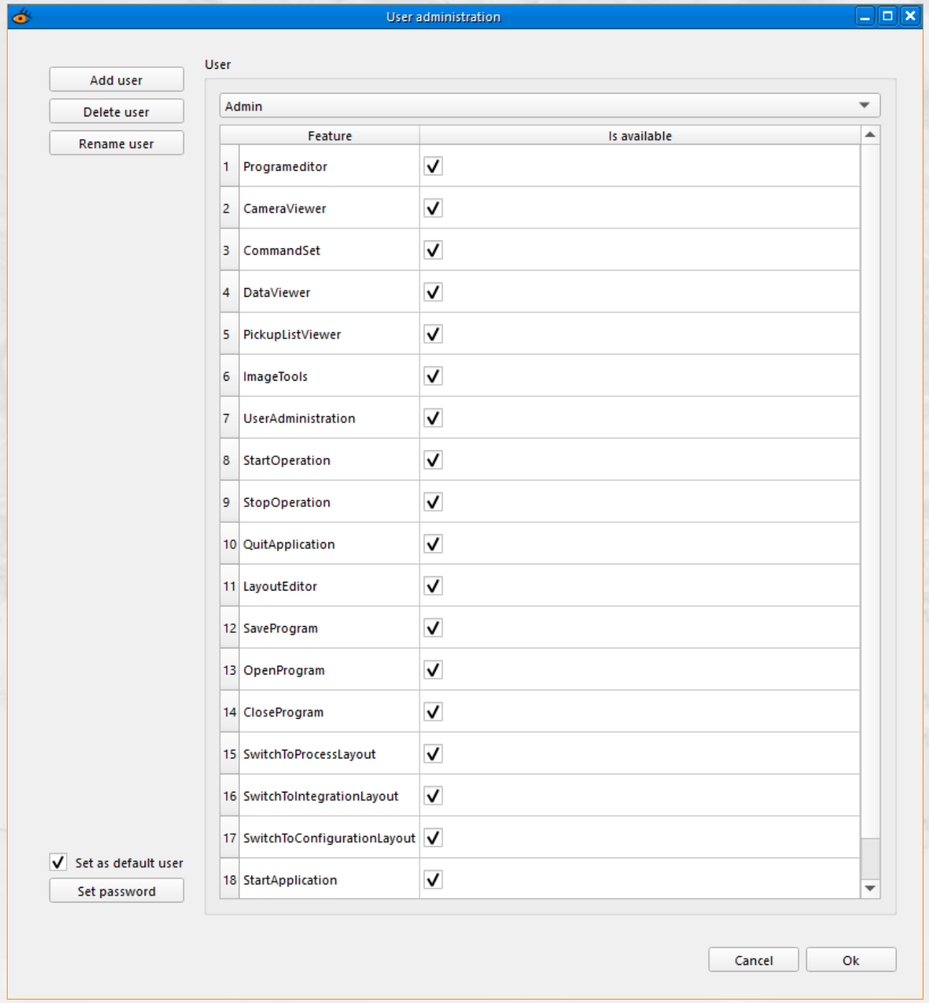
Limited access focused on process operations

Technician (MA2)

Setup and maintenance procedures

Engineer (MA3)

Full configuration and modification privileges



Key Benefits

Enhanced Security

Safeguards system integrity and prevents unauthorized modifications

Access Control

Precise control over functionality based on user roles

Operational Efficiency

Streamlined workflows with role-specific access to necessary functions

Workflow Optimization

Operators interact only with necessary controls for specific tasks

Complete OEM Customization

EyeVision offers comprehensive OEM support for volume customers, transforming the software into a seamless extension of your product line.

Bespoke Setup

Configure initial settings, workflows, and parameters according to your specific requirements.

Custom Application Name

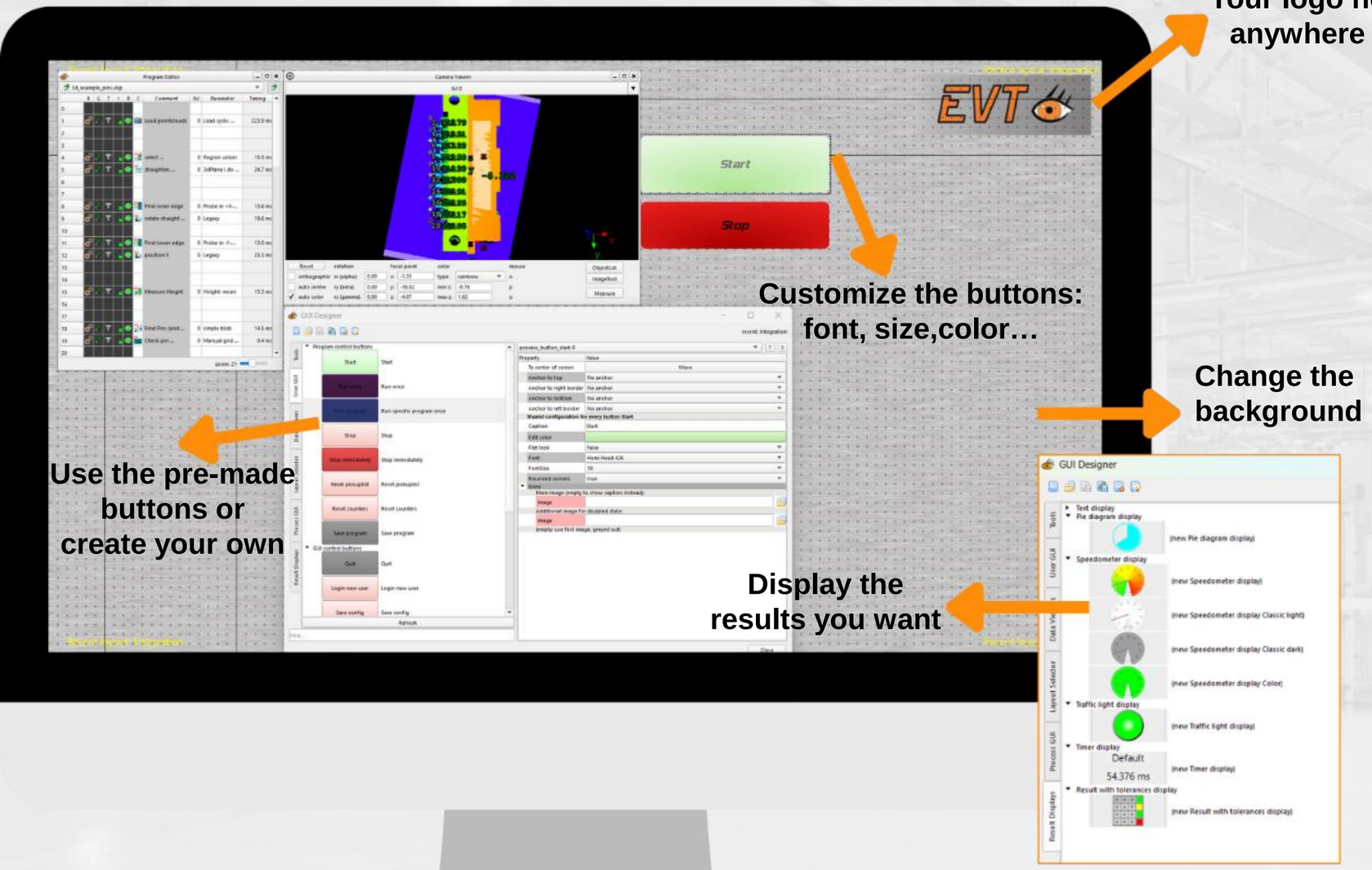
Rename the application to match your company's branding and product line.

Unique Icons

Replace standard icons with your company's visual identity elements.

Picture generated with AI

Integrated GUI Builder



Key Benefits

Customized Operator Interfaces

Design simplified, application-specific UIs that enhance usability for machine operators

Task-Specific Tailoring

Tailor interfaces to specific tasks, ensuring operators interact only with necessary controls

Error Reduction

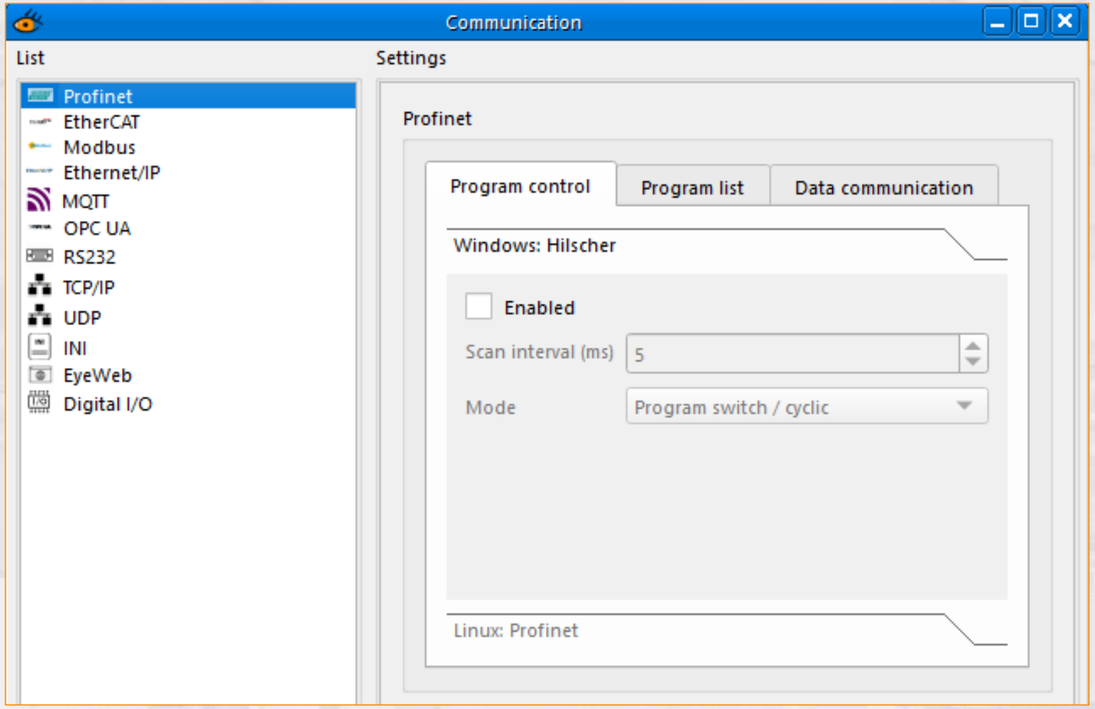
Minimize potential errors and reduce training time with intuitive layouts

Implementation Flexibility

Implement custom interfaces with ease, integrating with EyeVision's robust functionality

Comprehensive Communication Protocols

EyeVision provides ready-to-use communication protocols, enabling seamless integration with existing systems and devices.



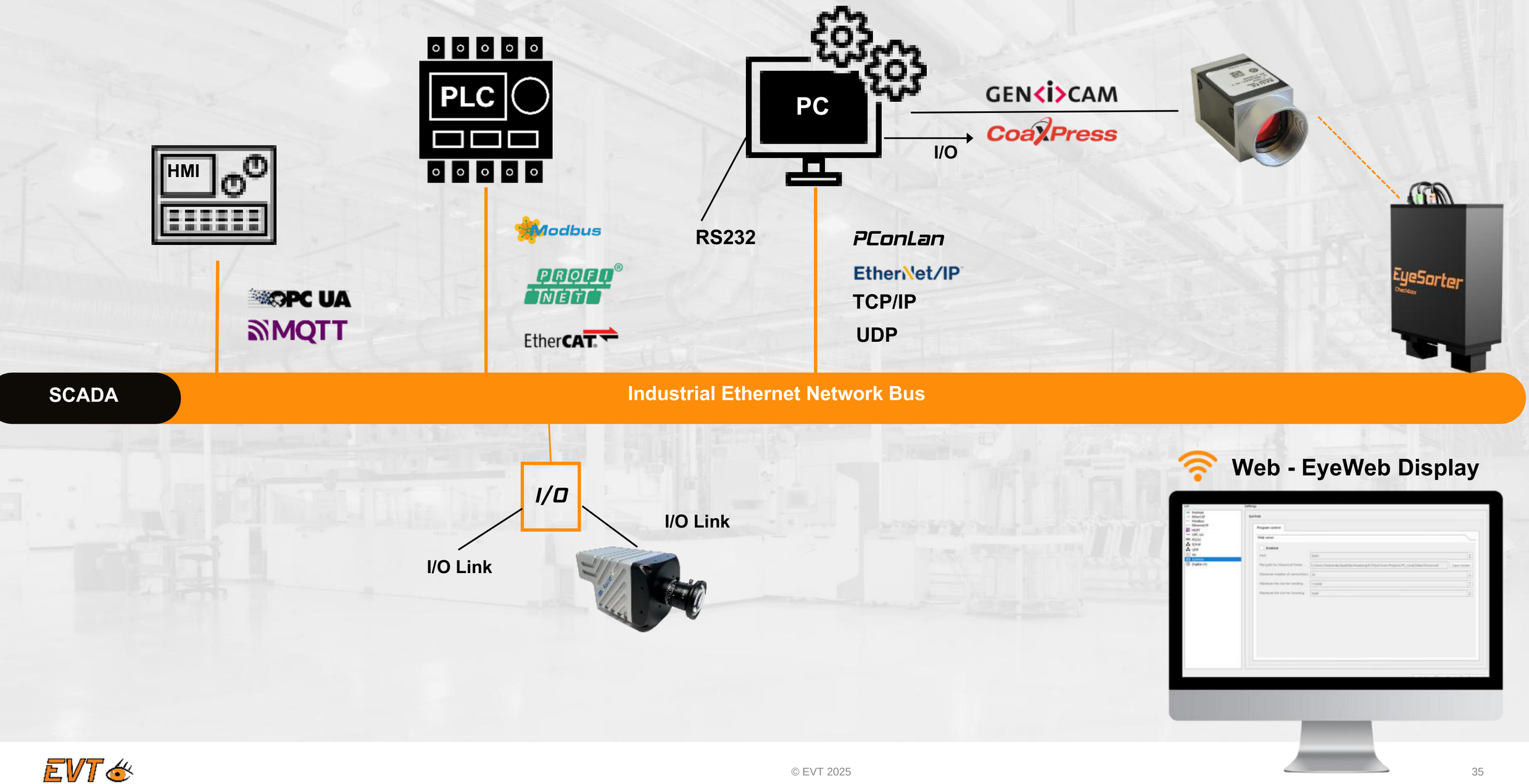
Implementation Benefits

Ready to Use
Pre-configured protocols for immediate implementation

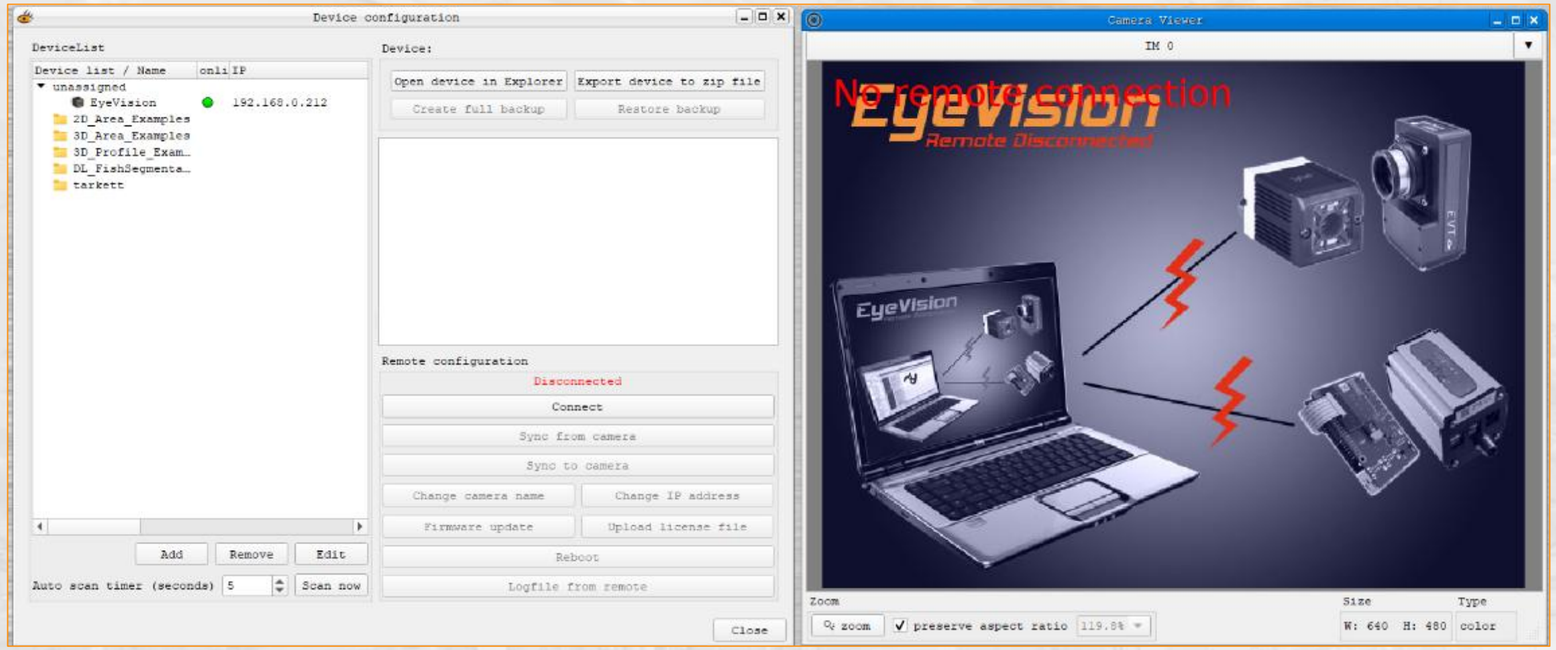
High Performance
Optimized for real-time data exchange requirements

Reliable Connectivity
Robust communication with error handling and recovery

System Integration
Easily connect with PLCs, SCADA, and other automation systems


HMI
PLC
PC
GEN<i>CAM
CoaXPress
I/O
RS232
Modbus
PROFINET
EtherCAT
PConLan
EtherNet/IP
TCP/IP
UDP
OPC UA
MQTT
EyeSorter
SCADA
Industrial Ethernet Network Bus
I/O
I/O Link
I/O Link
Web - EyeWeb Display

Remote Operation Capabilities



Multi-Hardware Support

EyeVision supports remote operation on smart cameras and various hardware platforms, enabling consistent vision processing across different devices.

Remote System Programming

Program EyeVision remotely from any connected device, facilitating setup and reconfiguration without physical access to the hardware.

Distributed Architecture

Separate processing stages can run on different devices, creating a distributed vision system that optimizes resource utilization.

Secure Communication

EyeVision ensures secure communication between remote devices, maintaining system integrity and preventing unauthorized access.

Why choose EyeVision?

COMMUNICATION PROTOCOLS

Seamless integration with **ProfiNet**, **Modbus**, **EthernetIP**, **EtherCAT**, **OPC UA** and more.

SMART CAMERAS

Supports a wide range of smart cameras for diverse applications.

OPERATING SYSTEMS

Supporting with **Windows**, **Linux**, **macOS**, but also Intel, x86, ARM and MIPS platforms.

I/O BOARDS & CO.

Includes **EyeMio BLE** and other advanced components.

CAMERAS

Handles **1D**, **2D**, **3D**, **thermal**, and **hyperspectral** imaging.

ACCESSORIES

Complete range of **lighting**, **lenses**, and **filters** for optimal performance.

PC & EMBEDDED SYSTEM

Flexible solutions for **PC-based**, **PCB-based**, and **embedded** vision applications

EYE VISION

FLEXIBLE COMPATIBLE LIMITLESS

EyeVision

Designed for simplicity and performance in machine vision.

Scan to experience our No-Code,
Drag-and-Drop image processing software

EyeCademy Trainings

Master machine vision – learn, practice, and apply with experts!

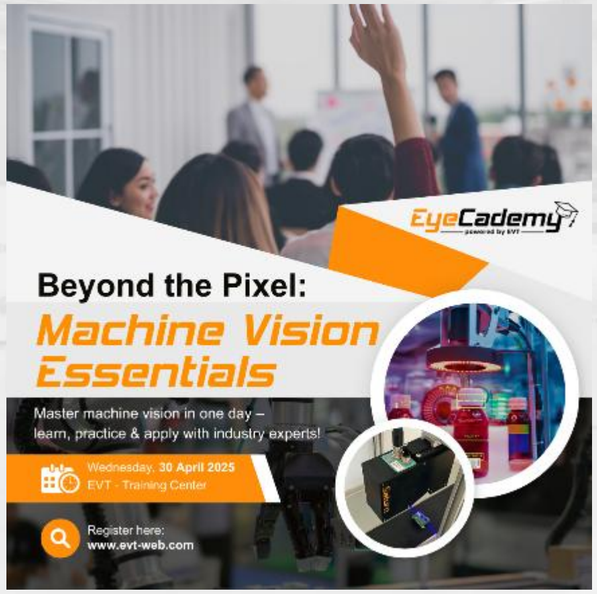
The **Beyond the Pixel Training Series** is designed to help you master **machine vision, image processing, and smart automation technologies** through hands-on experience. Whether you're an engineer, integrator, or automation specialist, our one-day intensive sessions will equip you with **practical skills, industry insights, and expert knowledge**.

Why Attend?

- ✓ Learn how to optimize **lighting, lenses, and cameras** for better image processing.
- ✓ Get **hands-on experience** with our powerful **EyeVision software** and real applications.
- ✓ Understand how to **select the right hardware** for different automation scenarios.
- ✓ Improve your **robot vision and quality control capabilities** with smart solutions.
- ✓ Network with **industry experts and like-minded professionals**.

Each session focuses on a key aspect of machine vision, ensuring you gain both **theoretical knowledge and real-world experience**.

Register here: https://www.evt-web.com/eyecademy-training/



CONTACT US

+49 (0) 721-668-004-230

www.evt-web.com

kontakt@evt-web.com

Headquarter: Ettlinger Straße 59, 76137
Karlsruhe, Germany

Training Center: Lauterbergstraße 2, 76137
Karlsruhe, Germany