AI computer Vision for
Smart Agrifood

Optimize growth, planning, and productivity

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AI Computer Vision brings visual intelligence to the heart of Agrifood operations.

It monitors crop development, optimizes harvesting, detects defects in real time, and ensures traceability and flawless presentation in every package, helping agri-food companies make smarter decisions based on precise visual data.

By seamlessly integrating with ERP platforms, sensors, satellite imagery, and even advisory systems via WhatsApp, our solution simplifies harvest planning, resource management, and regulatory reporting.

Key benefits

>90%
Defect Detection Accuracy

>90%
Reduction in Quality Control Labor Costs

90%
Real-Time Visibility and Alerts

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Pain Points

Lack of Real-Time Crop Insight

The absence of visibility into crop conditions delays critical decisions, reducing responsiveness to unforeseen events and negatively impacting productivity.

Inefficient Use of Resources (Water, Labor, and Materials)

Resource management based on manual estimations leads to waste of water, fertilizers, and labor, reducing both sustainability and profitability.

Disconnected Systems and Manual Reporting

Fragmented information across different systems delays strategic decision-making and hinders efficient planning.

Poor Planning and Limited Predictability

Unreliable forecasts make it difficult to determine the optimal harvesting time, leading to product losses and inefficiencies in the supply chain.

Human Error and Inconsistent Inspection

Manual inspection, being subjective and variable, allows defects to pass through or causes unnecessary rejections, impacting both quality and revenue.

Smart Quality Control:
Automation, Precision, and Sustainability Across All Dimensions of Quality Assurance

Our AI-powered quality control solution automates product and packaging inspection, ensuring quality, regulatory compliance, and waste reduction, while boosting efficiency, profitability, and sustainability.

Automating Quality Control in the Field and Factory

AI Computer Vision automates the inspection of fresh produce, meat, and packaged goods, assessing shape, color, size, and surface quality. It reduces reliance on skilled labor, boosts throughput, and ensures consistent grading under any lighting or positioning conditions.
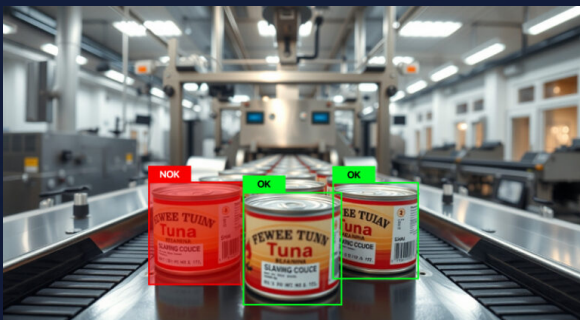
Compliance Secured Through Accurate Labeling

Ensure food safety and traceability with automated packaging inspection. Our system verifies barcodes, expiration dates, lot numbers, and label alignment, preventing errors that could lead to recalls or regulatory non-compliance.

Cutting Food Waste with Real-Time Defect Detection

Our solution detects defective or non-compliant items early, reducing waste and rework, boosting yield and line efficiency, and supporting sustainability goals in AgriFood production.

AI Computer Vision
Use Cases

Tupl's AI Computer Vision automates quality checks, reduces inspection time, and ensures consistent product standards with no-code AI.

Preserved food manufacturer

Real-time defect detection in high-speed canning lines

Our machine vision system detects marking and filling defects on containers in real time, triggers automatic rejection within milliseconds, and offers a touchscreen interface for configuration — all fully integrated with existing factory systems.

Challenge

- Detection and rejection of defects in under 0.5 seconds per unit, ensuring real-time execution synchronized with actuators and conveyor belt speed.

- Integration with a PLC, under strict electrical and I/O constraints, while interfacing with sensors, alarms, and ERP systems.

- Training of accurate models (>90% accuracy) using limited, high-quality datasets across various defect types and container formats.

- Configuration of custom alarm logic allowing operators to set alarm thresholds, for example, triggering alerts after a defined number of consecutive defects.

Benefits

- ✓ Reduces operator workload related to inspection by 80%, minimizing manual intervention.

- ✓ Meets the accuracy threshold above 90%.

- ✓ Prevents quality issues from escalating through real-time alarms triggered by consecutive anomalies.

- ✓ Reduces false rejects and under-detected defects by 40%, improving product yield and consistency.

- ✓ Seamlessly adapts to different container types and formats, enabling scalability across production lines.

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Large agricultural producer

Automation of Fruit Counting and Classification

Our mobile-based computer vision system automatically detects, counts, and classifies fruits by ripeness using smartphone images, enabling accurate weekly yield estimates, real-time harvest planning, and scalable, reliable agricultural forecasts.

Challenge

- Automatic Detection and Classification of Fruits of Different Sizes, Colors, and Visibility Across Various Plant Types and Growth Stages

- Accurately count fruits from images without standardized backgrounds or fixed positions.

- Assign fruit counts to specific field zones and aggregate the results for weekly yield forecasts.

- Development of a mobile application to ensure a consistent image flow from on-field capture to cloud storage, enabling subsequent AI-based detection.

Benefits

✓ Forecast accuracy improves from ~75% to ≥95%, cutting estimation error in half.

✓ Field coverage efficiency increases fourfold (from 10 to 40 hectares per worker per day).

✓ Reduces manual workload and operator fatigue.

✓ Generates actionable outputs such as maturity and harvest estimation tables.

✓ Seamlessly integrates with SAP and agronomic platforms via API.

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