Vision AI Assistant

Visual anomaly detection in HMI/SCADA

Take images from existing general-purpose cameras and easily convert them into classification-based analytics. Vision AI Assistant monitors real-time image streams and provides alerts and notifications to operators for immediate action.

Integrated with AVEVA's HMI/SCADA software and AVEVA™ Insight, Vision AI Assistant employs deep learning to train and deploy machine-learning models from an easy-to-use web-based interface. Simply use live camera feeds and preferred-state images to teach the analytical model. The solution processes the live images and automatically generates an alert when an image deviates from its normal or expected state.

Designed for low latency industrial environments, Vision AI Assistant enhances situational awareness by helping operators focus on their tasks without needing to continuously monitor live camera feeds. This leads to increased equipment uptime, failure prevention, and improved responsiveness to issues not readily automated through control systems.

AVEVA

# Use cases for applying Vision AI Assistant

Operations

Employ infrared or thermal cameras to determine visual anomalies.
For example: Locate compressed air and vacuum leaks to reduce energy waste. Analyze electrical partial discharge patterns to minimize failures and downtime. Detect an assembly line jam. Deploy cameras in areas not suitable for humans due to security or safety concerns.

Quality

Use cameras to identify quality issues or ensure quality control. For example: Determine the quality of the fluid in water treatment or gauge if a hopper is full or empty. Cameras are also of use in scenarios where quality control is subjective, such as identifying the color of an item.

Maintenance

Deploy cameras that can be used to continuously monitor a certain section of the plant or machinery to provide early warning notification and diagnosis of equipment issues days, weeks, or months before failure. For example: Rely on cameras for overhead transportation such as chain or cart breakage.
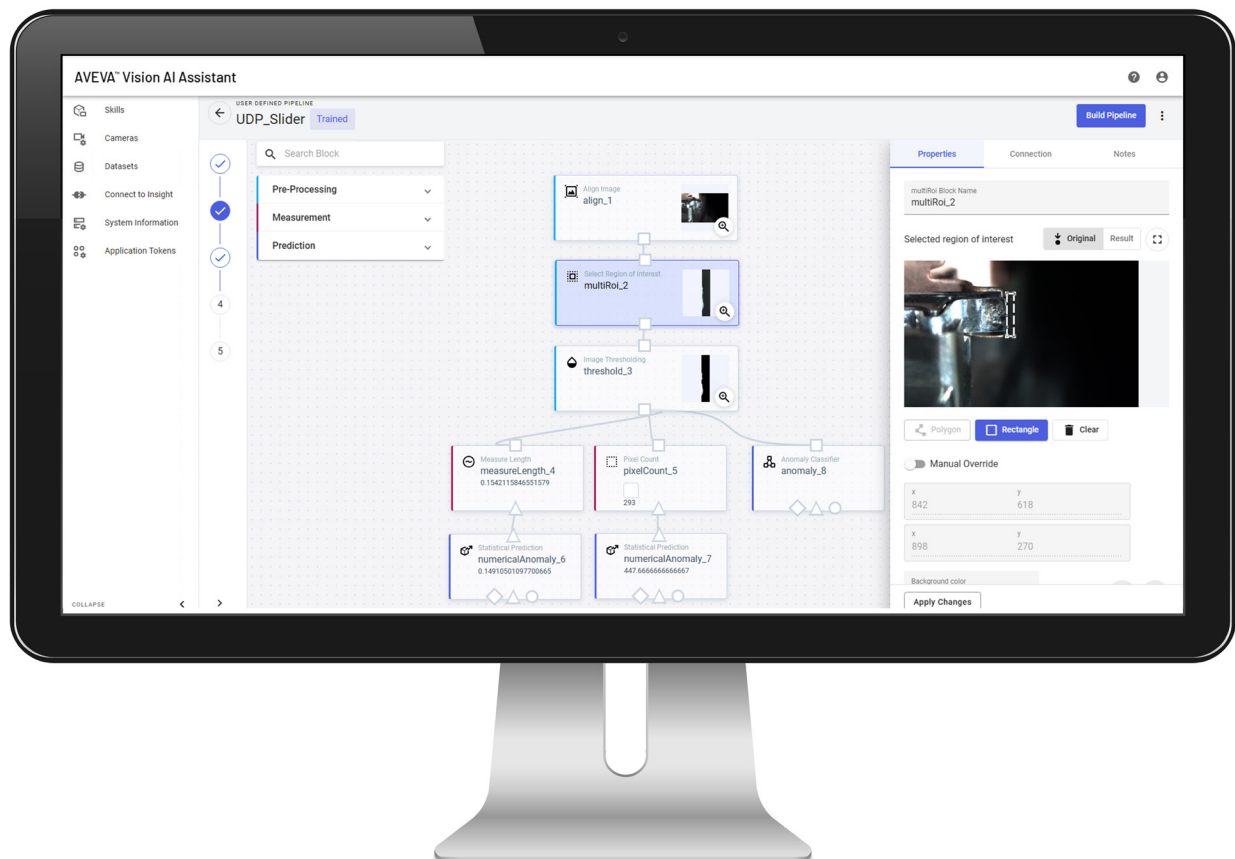
Analytic modes – Vision AI Assistant skill types

Anomaly detection

An unsupervised machine algorithm first learns baseline trends, then applies a statistical test to determine if a specific image represents an anomaly.

This method can detect any type of anomaly, including novel anomalies. Users train the algorithm with images that represent the expected outcome or 'good' condition. Vision AI Assistant then determines an anomaly when real-time images do not match training images.

The anomaly detection model is most useful when it has access to a broad set of images to represent the 'normal' state—and there exists a vast array of negative states for which images are not readily available.
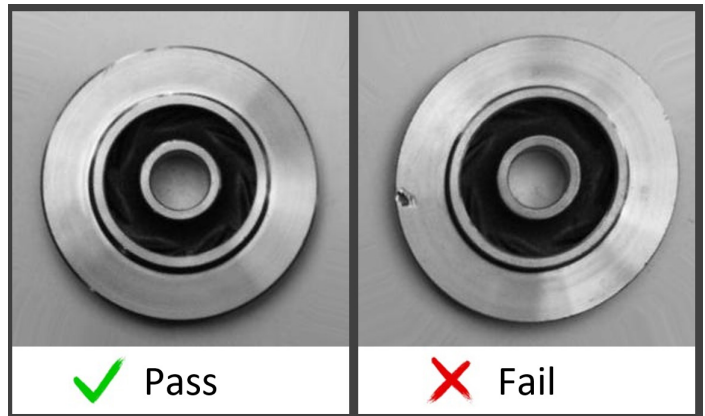
Discrete state detection

This method utilizes a supervised deep-learning algorithm to distinguish between two known states.

Users provide training images containing examples which are already labelled or categorized, and the algorithm builds a general model of each category. The algorithm then processes the uncategorized images and attempts to assign each item to one of the pre-learned categories.

Discrete state detection is most useful when both states are known and identifiable to train the learning algorithm.
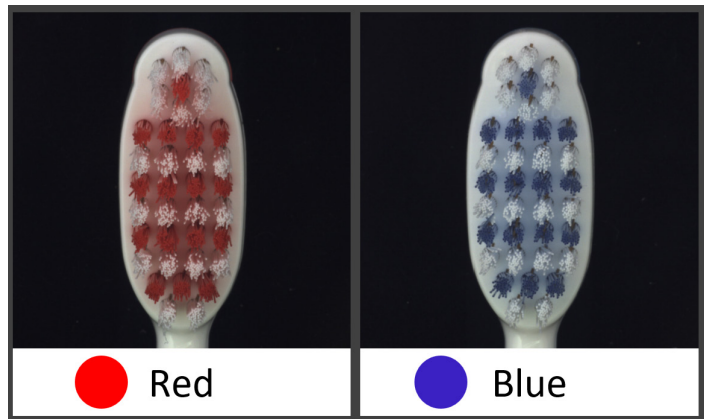
User-defined pipeline (UDP)

This is the most sophisticated skill type available with Vision AI Assistant for advanced image processing prior to model detection.
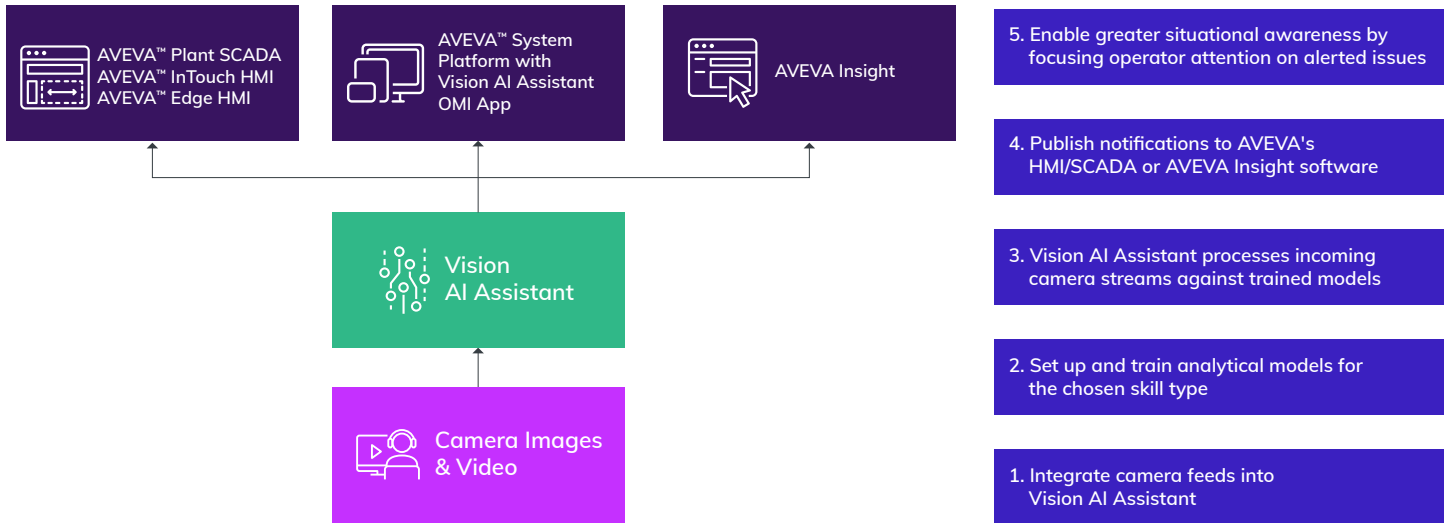
Self-specify a series of automated steps in a chain for pre-processing and transformation of desired images. This can include image alignment, area isolation, colorization, artifact measurement and more. The input image travels through this series of defined processing blocks, transformations, or actions (referred to as a pipeline) to achieve the desire prediction output.

UDP is highly flexible and powerful for a range of use cases: measuring product dimensions, area personnel restrictions, discoloration, finding defects, and more.

✔ Pass ✘ Fail

🔴 Red 🔵 Blue

✔ **Acceptable Burr Size** ✘ **Defective Burr Size**
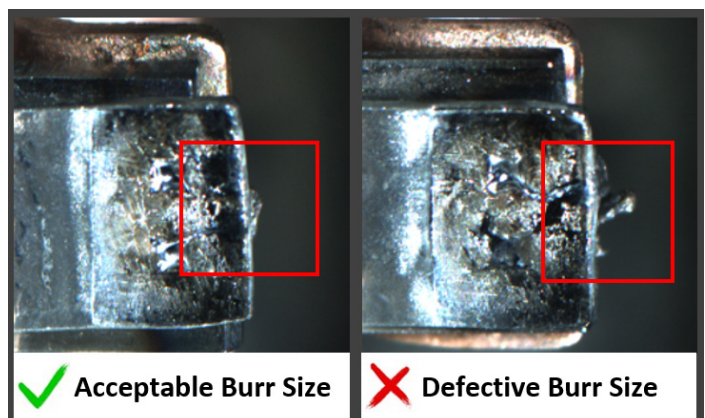
How Vision AI Assistant works

Turn cameras into an extension of your process control network as visual sensors. Provide enhanced visibility into process areas that are not easily automated or are unsafe or inaccessible for personnel. With increased situational awareness, operators can become more responsive to potential issues, increasing equipment uptime as well as preventing failures or safety hazards.

AVEVA™ Plant SCADA
AVEVA™ InTouch HMI
AVEVA™ Edge HMI

AVEVA™ System Platform with Vision AI Assistant OMI App

AVEVA Insight

Vision AI Assistant

Camera Images & Video

5. Enable greater situational awareness by focusing operator attention on alerted issues

4. Publish notifications to AVEVA's HMI/SCADA or AVEVA Insight software

3. Vision AI Assistant processes incoming camera streams against trained models

2. Set up and train analytical models for the chosen skill type

1. Integrate camera feeds into Vision AI Assistant

Enable context-aware alerts for AVEVA System Platform

The Vision AI Assistant OMI App is an easy addition for an AVEVA System Platform application. It taps into the context-aware environment of AVEVA™ Operations Management Interface. And automatically links alerts with specific areas of your processes.

How to get Vision AI Assistant

Subscribe to AVEVA™ Operations Control, AVEVA's HMI/SCADA, or AVEVA Insight software through the AVEVA™ Flex subscription program and receive access to Vision AI Assistant included.

Exclusively available through AVEVA Flex

The AVEVA Flex subscription program spans any mix of cloud, hybrid and on-premises solutions across AVEVA's comprehensive portfolio with simplicity in the license purchase, usage and management.

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