



Aurora Design Assistant

(formerly Matrox Design Assistant)

Release 10.0
(Version 24H1)

Machine Vision
February 2024

Aurora Design Assistant 10.0

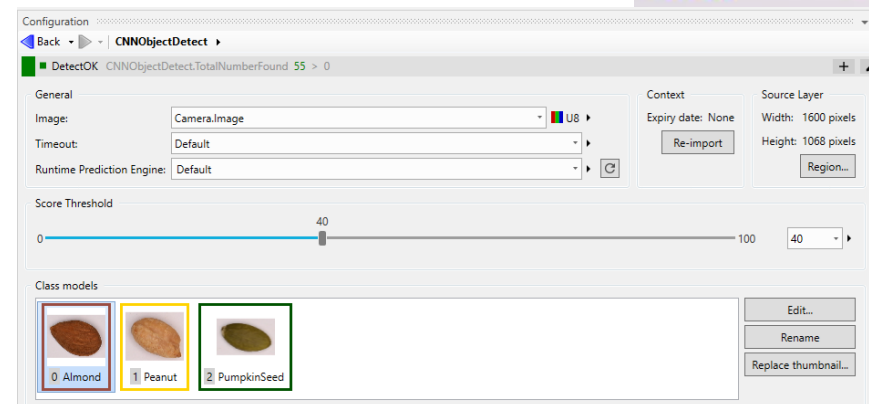
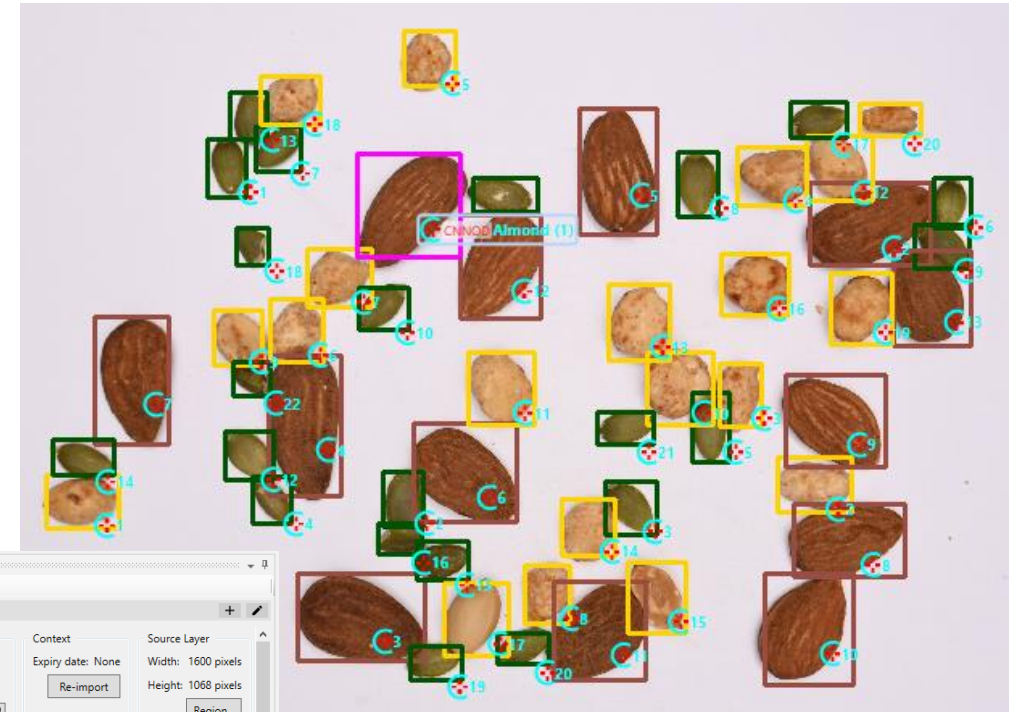
Key additions and enhancements

- Object detection using deep learning
- 3D surface matcher
- 3D box finder
- Other 3D enhancements
- Alternate barcode and DataMatrix readers
- Project differences utility
- Camera discovery
- Operator View improvements
- Additional security options
- Companion updates
- Requirements

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Object detection using deep learning (CNNObjectDetect)

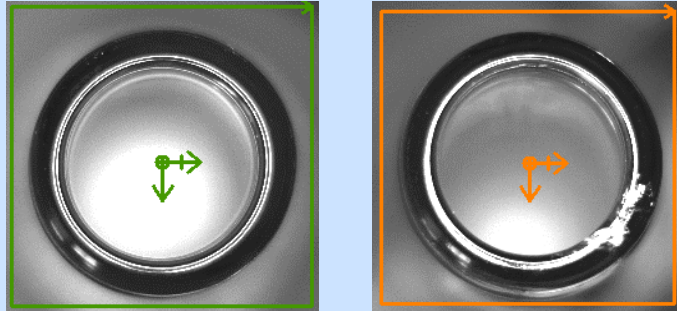
- Locates instances of a pretrained object or feature class
- Identifies class, provides detection score, and produces a bounding box
- Gives bounding box characteristics: coordinates of corners, center, height, and width
- Trained using [Aurora Imaging CoPilot](#) companion application



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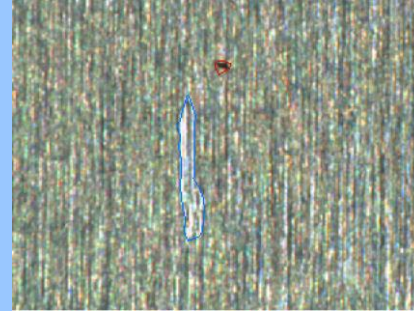
Available deep learning models

Image classification



- For identifying images
- Categorizes images (or ROIs)
- Assigns image to a class
- Must be trained with sample images of expected classes

Image segmentation



- For spotting features (ex. defects)
- Categorizes image neighborhoods
- Marks irregular features in an image
- Must be trained with samples of segmented expected features

Object detection *NEW!*

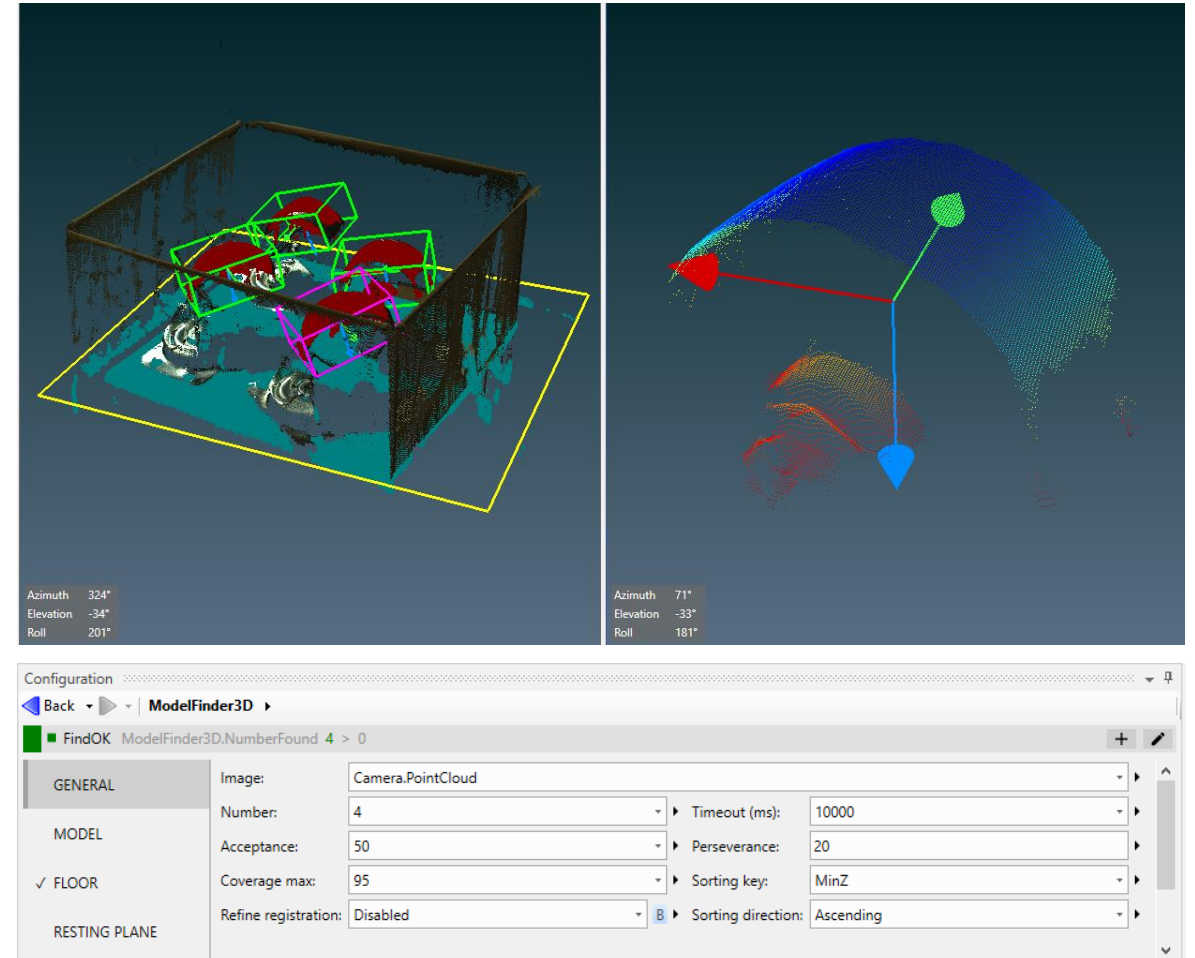


- For finding and counting objects
- Categorizes image neighborhoods
- Encloses objects (or features) in an image within a bounding box
- Must be trained with samples of enclosed expected objects

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3D surface matcher (ModelFinder3D)

- Finds surface models in a point cloud
- Surface models defined from a 3D scan or a CAD file
- Controls provided to influence search accuracy, robustness, and speed
- Returns number of occurrences found, scores, center coordinates, estimated pose, and number of points
- Requires Geometric Model Finder and 3D ... Supplemental license
 - DXRT????G???????? / DXRT????2???????? +
DXRT?????3???????? / DXRT?????2????????

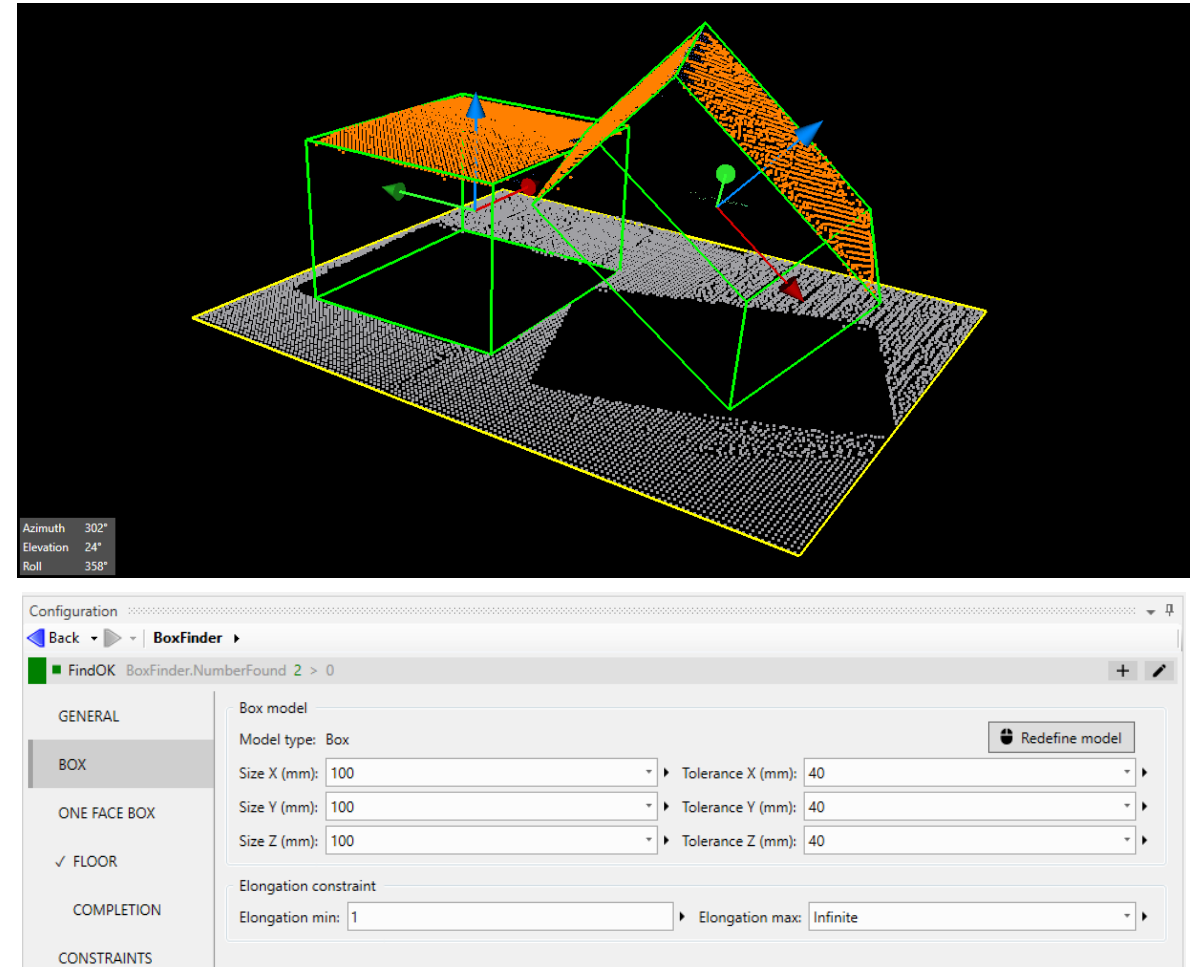


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3D box finder (BoxFinder)


- Optimized for finding boxes in a point cloud
- Boxes to find are specified graphically or numerically
- Returns position and orientation information of a whole box and its faces
- Also provides dimensions*
- Handles situations where a restricted number of faces are visible

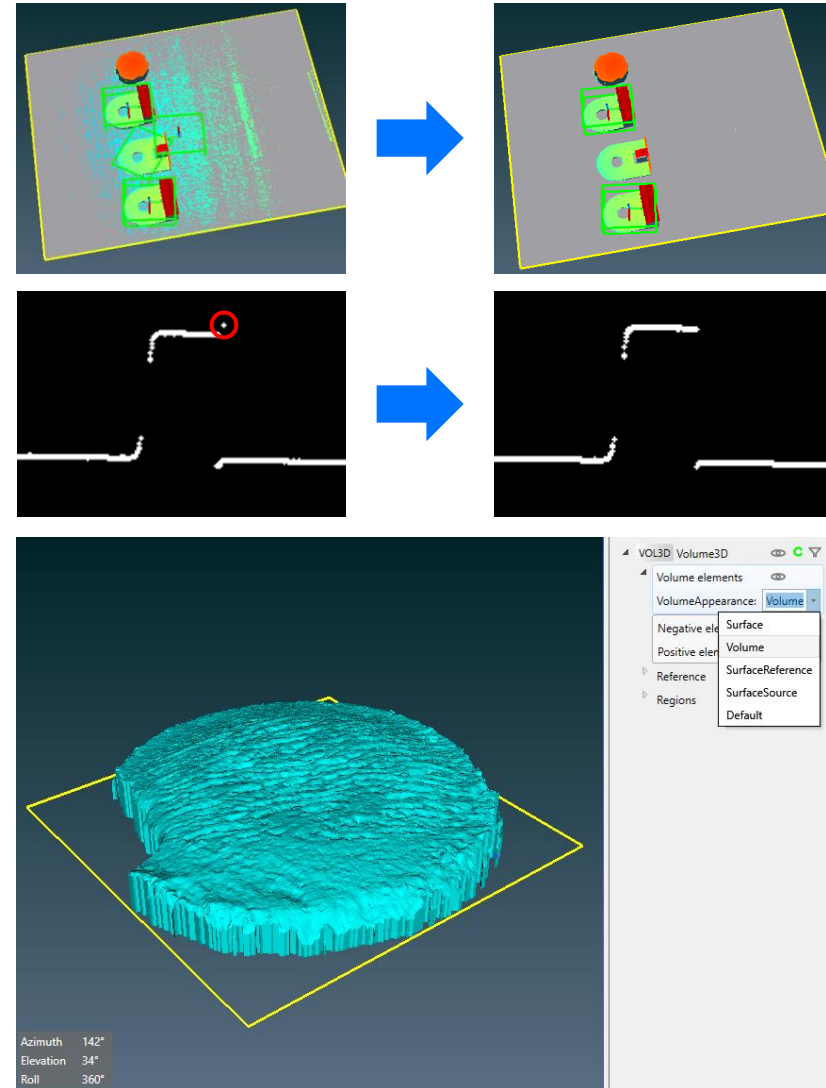
*Not legal for trade



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Other 3D enhancements

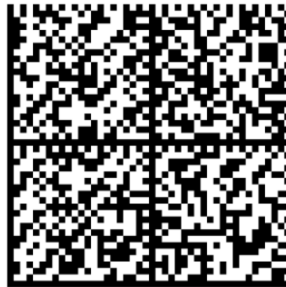
- Auto plane fit to set a resting surface (ex. floor) and establish its orientation
 - PlaneFit step 
- Offset adjustment to compensate for an uneven surface when cropping relative to it
 - Available in PlaneFit, ModelFinder3D and BoxFinder steps
- Profile filter to remove noise
 - Available in Camera and ExtractProfile steps
- More display options including volume visualization
 - Available at design-time and run-time



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Alternate barcode and DataMatrix readers

- CodeReaderIK custom step
 - Reads multiple codes at once
 - Supports smaller minimum module width than original CodeReader step
 - Supports GSI-128 code type
- DataMatrixAVL custom step
 - Reads multiple DataMatrix codes at once
 - Recognizes multi DataMatrix codes



The screenshot displays the 'Add Step' dialog in Aurora Design Assistant 10.0. The 'Custom Steps' tab is active, showing three step icons: 'ArrayInput', 'CodeReaderIK', and 'DataMatrixAVL'. The 'CodeReaderIK' and 'DataMatrixAVL' icons are highlighted with a blue rectangular box. Below the step selection area, two configuration panels are visible.

CodeReaderIK Configuration:

- General: Image: Camera.Image, Timeout: 2000, Search Region: [button]
- SEARCH PARAMS: Max code count: 5, Decode identical symbols:
- DATAMATRIX: Inverse: Regular, Exhaustive search attempt:
- Code Types: Code39, Code128, Interleaved2of5, Datamatrix, PDF417, QRCode, UPCEAN, Code93, DotCode, MaxiCode, Aztec, MSI, GSI Databar, Codabar

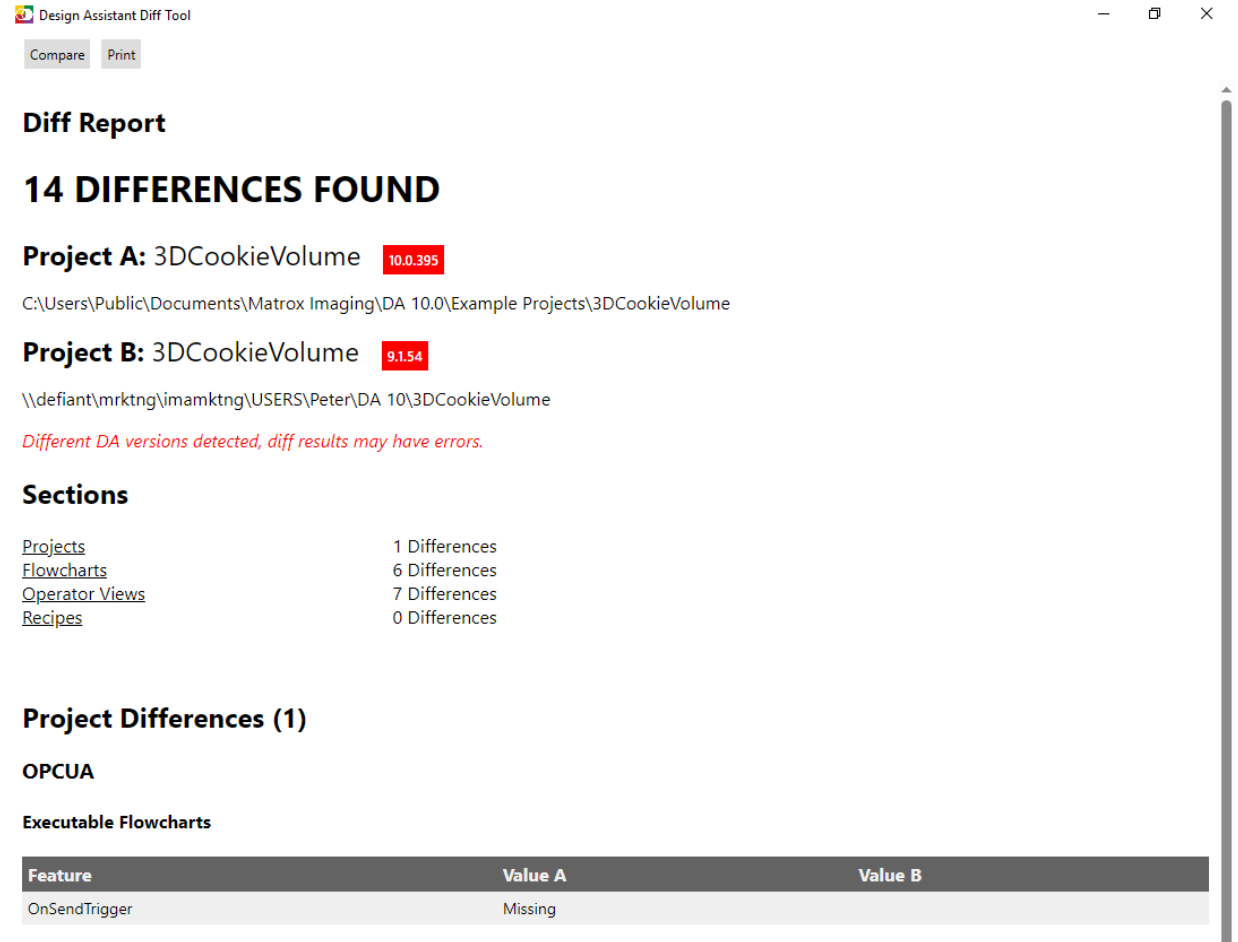
DataMatrixAVL Configuration:

- Image: Camera.Image, Max code count: 2, Search Region: [button]
- Detection method: FinderEdges, Finder tradeoff: Balanced, Mirrored:
- Pyramid strategy: Precise, Distortion level: Low
- Polarity: Any, Contrast threshold: 10
- Min module size: 4, Max module size: 40

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Project differences utility

- Compares two projects
 - Deployed versus main reference
 - From different deployments
 - Created using different software versions
- Reports differences to project elements including flowcharts, steps, recipes, and Operator Views (web-based HMI)



Design Assistant Diff Tool

Compare Print

Diff Report

14 DIFFERENCES FOUND

Project A: 3DCookieVolume 10.0.395
C:\Users\Public\Documents\Matrox Imaging\DA 10.0\Example Projects\3DCookieVolume

Project B: 3DCookieVolume 9.1.54
\\defiant\mrktng\imamktng\USERS\Peter\DA 10\3DCookieVolume

Different DA versions detected, diff results may have errors.

Sections

Projects	1 Differences
Flowcharts	6 Differences
Operator Views	7 Differences
Recipes	0 Differences

Project Differences (1)

OPCUA

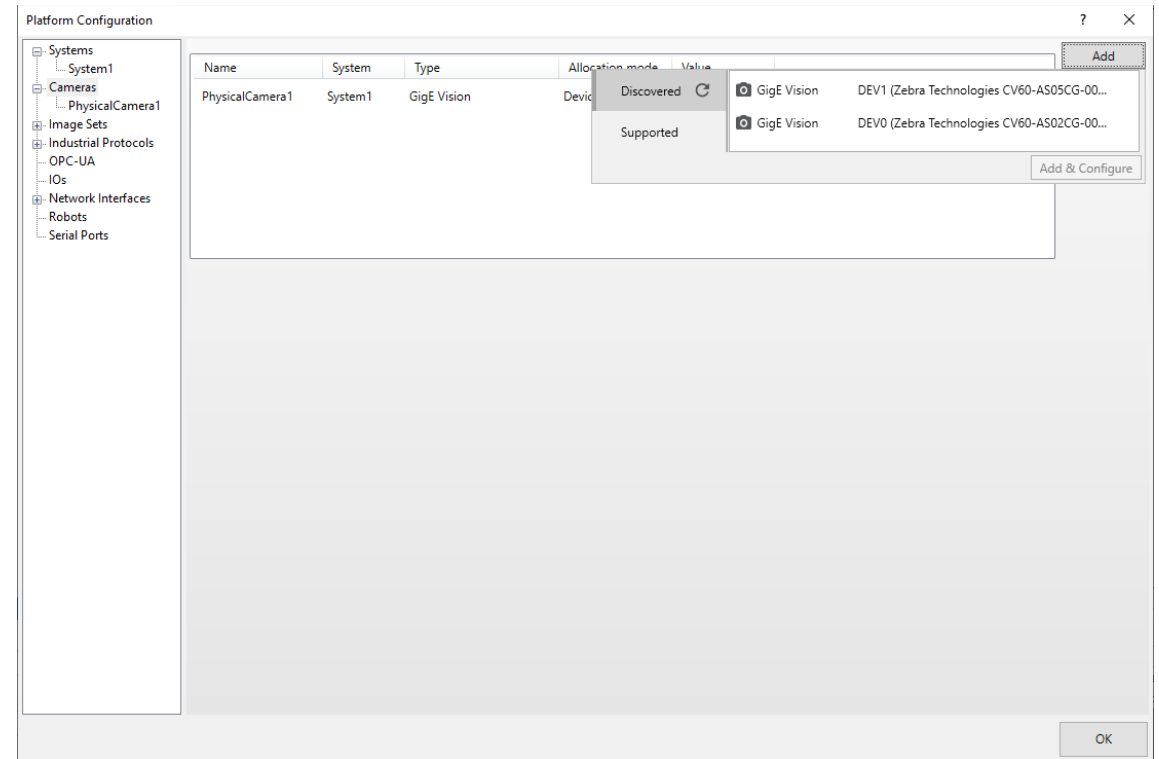
Executable Flowcharts

Feature	Value A	Value B
OnSendTrigger	Missing	

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Camera discovery

- Available in design-time environment
 - Like in separate Capture Works utility
- Finds connected GenICam-compliant cameras
 - CoaXPress standard
 - GigE Vision standard (CV60 series)
 - USB3 Vision standard



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Operator View improvements

- DataGrid control
 - Quickly set up the display of lists and arrays including historical data
- Runtime control bar
 - For projects that use image sets
 - Create snapshots for side-by-side comparison of parameters changes
 - Drill down to individual status conditions
 - Integrates with Project Change Validator
 - Record, employ and compare against validation sets

Index	Nut type	Score
1	Almond	100.00
2	Almond	100.00
3	Almond	100.00
4	PumpkinSeed	100.00
5	Almond	100.00
6	PumpkinSeed	100.00
7	Almond	100.00
8	PumpkinSeed	100.00
9	PumpkinSeed	100.00
10	Almond	100.00
11	PumpkinSeed	99.99
12	PumpkinSeed	99.99
13	Almond	99.99
14	Peanut	99.99
15	Peanut	99.99
16	Peanut	99.98
17	PumpkinSeed	99.98
18	Almond	99.97
19	Peanut	99.96
20	PumpkinSeed	99.95

The screenshot displays a runtime control bar with a list of image sets. Each item includes a thumbnail image of nuts, a title, a status indicator, and a pass/fail count. The status indicator shows 'Pass' with a green checkmark and a red X. The pass/fail count is '1 0 0', indicating 1 pass, 0 fails, and 0 errors.

Image Set	Status	Pass	Fail	Error
1 Image008.jpg	Pass	1	0	0
2 Image016.jpg	Pass	1	0	0
3 Image019.jpg	Pass	1	0	0
4 Image020.jpg	Pass	1	0	0
5 Image022.jpg	Pass	1	0	0
6 Image030.jpg	Pass	1	0	0

8 Total

Previous 1 2 Next

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Additional security options

- Support for HTTPS encrypted communication
 - To access Operator View and management portal
- User authentication
 - Control access to Operator View and management portal
 - Supports local users and integration with Microsoft Active Directory service
 - Identity and access management using [Keycloak](#)

The screenshot shows the 'Web Server Protocol Settings' page in the Aurora Design Assistant 10.0 interface. The navigation menu at the top includes HOME, PROJECTS, VIEW, TOOLS, COMMS, and MONITORING. Below this, the SECURITY section is active, with sub-tabs for WEB SERVER, AUTHENTICATION, and LOCK KEY. The 'Web Server Protocol Settings' section contains a toggle for 'Https Enabled' (currently off), and two file selection fields for 'SSL Certificate File' and 'SSL Key File', both showing 'No file chosen'. A 'SAVE SETTINGS' button is located at the bottom of the form.

The screenshot shows the 'Authentication Settings' page in the Aurora Design Assistant 10.0 interface. The navigation menu at the top includes HOME, PROJECTS, VIEW, TOOLS, COMMS, and MONITORING. Below this, the SECURITY section is active, with sub-tabs for WEB SERVER, AUTHENTICATION, and LOCK KEY. The 'Authentication Settings' section contains a toggle for 'Authentication Enabled' (currently off) and a text input field for 'Identity Provider (Keycloak)' with the value 'http://<server-name>:8080/realms/Design-Assistant'. A 'SAVE SETTINGS' button is located at the bottom of the form.

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Companion updates

Update	Description
Update 133	Support for deep learning classifier training using an NVIDIA GPU
Update 134	Support for deep learning inference using an Intel iGPU
Update 135	Support for deep learning inference using an NVIDIA GPU

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Requirements

- Windows 10 Version 1809 to 22H2 or Windows 11 Version 21H2 and 22H2
- Visual Studio 2022 for coding custom steps
- MIOS 5.00 firmware for Iris GTX