EyeSpector & EyeVision Tools

Here is a partial listing of the machine vision tools available in the EyeSpector and EyeVision North American product families. Each listing shows the EyeVision software icon followed by the tool name and a brief description of it's purpose.

These are the building blocks of machine vision programs. To use one of these tools, drag it into the desired place in the program. A dialogue box with parameters for the tool automatically opens. Make any desired changes to the default parameters which are already provided. Where applicable, an "on image" dialogue is also provided to position and size the tool as desired on the image.

If you think that these tools may be useful in your machine vison application, call FSI at 630-932-9380. We'll be pleased to send you a demo disk and discuss your application.

Image Acquisition

Capture images using cameras. Control camera triggering and flash. Load stored images, including cycling through defined groups of images. Store images. Storage may unlimited or limited to a single file, or a propgrammable maximum number of image fiels, after which the oldest image files within the group will be overwritten.

Asynchronous Image Acquisition

Parallel image processing for high speed applications. Image acquisition occurs simultaneously with processing of the previous image.

Camera Control

Control camera settings "on the fly".

Camera Settings

Camera Settings

Image Transfer

Transfer images to other systems via Ethernet TCP/IP. Conditional (such as for failed parts only) or unconditional transfer is available.

Brightness Correction

Brightness correction for a partial or full image. Transforms each pixel based on criteria which may be manually defined or automatically adjusted based on the gray level or histogram of a selected area or the entire image.

Scale Grey values

Set gray scale value for a particular area. (I.E. "paint" it with that value). The area and gray level may be statically or dynamically defined by settings within this tool.

Area Check

Pixel count / area check for a configurable range of gray values within a configurable area. Most setting may be statically or dynamically defined. Also evaluates the result for compliance with pass/fail and warning level criteria.

Classic Filter operators

The is the more basic of the EyeVision filter sets. For backward compatibility of programs and other purposes. Provides a choice of 16 filters with a repetition number setting for each. Area operated upon by the filter may be set to be the full image or a specific area which may be statically or dynamically defined.

Advanced Filter operators

Advanced filters and filter tools. The is the highly advanced EyeVision filter set. Forty different filters and image operators are offered, and each has it's own set of parameter settings. Includes provisions for combining two images via a variety of mathematical and logical operators. Includes the highly regarded EyeVision advanced edge detection

Filter Operators on a circle

Range of circular filters that operate on a statically or dynamically defined annulus or circular shaped area.

Circle Color Change In/Out

Fills choice of the area inside or outside of circle with a defined color. Circle may be statically or dynamically defined.

Remove Background

A defined image can be saved as background-image. It will be subtracted in inspection mode.

Image Information

Provides image information and evaluation based on comparing that data against standards. Including focus value, image format and brightness.

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Time measurement

Measures elapsed time, and sets time delays for program execution.

Interpreter Control

Defines conditional and unconditional jumps, marks, and jump destinations. Configurable to also set / control result flags. Occasionally named "Flow Control"

Subroutine call

Set conditional and unconditional jumps to sub-routines

BASIC Interpreter tool

Configuration and test window for (optional use) scripting based control and configuration capabilities.

Variable access, modification

Store, get data from, access and modify variables and registers.

Value evaluation

Select any variable and evaluate against a static or dynamic value or tolerance

Graphic Loopcontrol

Loop control, with various configuration settings.

External Function call

External function call (plug-ins etc.)

External Program call

External program call (plug-ins etc.)

Check Digital Input

Reads discrete input. Configuration of debounce, edge triggered and state triggered options.

Set Digital Output

Conditional or unconditional setting and resetting of discrete outputs. Criteria for conditional setting include pass, fail, violation of warning levels, edge and state based.

Serial Port Send / Receive

Configure and utilize RS232 / Serial input and output.

Create / Send Text line

Place string / text into an output interface or file.

Create / Write / Read to INI File

Programmatic access and modification of .ini files.

Display Register Values

Programmatically places text into images. Configure geometry, font, size, location and color. Text may be fixed or dynamically loaded from choice of sources.

Log Statistic values

Full range of controls for statistical operations. Begins with loading of, appending to and clearing or exporting of data sets. Calculations can be cumulative, cyclical or moving average based. Options include statistical calculations based on pass, fail warning level occurrences.

Lens Distortion Correction

Image modification level correction for lens distortion and other geometric distortions.

Lens Height Correction

Lens Height Correction

Coordinate adjustment, Calibration

Creation of adjustments for X & Y translation and rotational adjustments. For example, to cause tools for follow and adjust for all types of movements of the a target or reference object. Also includes capability for static and dynamic scaling of the image for both unit conversion and calibration purposes.

X-/Y- Position Correction

Automatic horizontal (X) and vertical (Y) position correction.

Select Color Channel

Selects an RGB color channel which is used for tools that follow.

Color Control

COmprehensive set of color filtering and evaluation tools. Including transformation to HIS color space and configuration of bands / criteria for Hue, Intensity and Saturation Selectable / configurable window for performance of the evaluation.

Color Filter

Previous color tool set, largely superceded by "Color Control" Set of color filtering and evaluation tools. Including transformation to HIS color space and configuration of bands / criteria for Hue, Intensity and Saturation Selectable / configurable window for performance of the evaluation. Creates a new filtered image as one of it's outputs.

DMC Read Orthogonal

Don't see it in the software. Has it been dropped?

DMC Read

Data Matrix Code Read. Full parameter settings, including full image or statically or dynamically set search area. Full parameter settings. Output may then be stored or transmitted as data, or compared to a static or dynamically set target value for pass/fail evaluation.

Barcode Reader

Bar code reader configuration and format settings. Output may then be stored or transmitted as data, or compared to a static or dynamically set target value for pass/fail evaluation.

OCR / OCV Control

One of 4 tools sets / icons for optical character recognition and optical character verification.

OCR / OCV Character Separation

One of 4 tools sets / icons for optical character recognition and optical character verification.

OCR / OCV Character Separation edge

One of 4 tools sets / icons for optical character recognition and optical character verification.

OCR / OCV Barcode Character

OCR / OCV Barcode Character

OCR / OCV Recognition

Grey Correlation

One of EyeVision's template matching tool sets, correlation based.

Reference Correlation

One of EyeVision's template matching tool sets, correlation based.

SmartMatch Contour Correlation

The most powerful of EyeVision's template matching tool sets. Very high performance with full rotary template matching capability.

Point List Operation

Save, retrieve, and do calculations on profiles and point lists.

Point Operation Set, Calculate

Full range of mathematical operations upon an image, geometric object or point list that result in the determination of a point.

Rectangle Edge Detection

Edge detection within a defined search area and search direction. Configuration settings define the search area (statically or dynamically), choice of edge detection algorithms and settings, all with sub-pixeling accuracy.

Circle Edge Detection

Edge detection within a defined annulus search area and radial search direction. Configuration settings define the search area (statically or dynamically), choice of edge detection algorithms and settings, all with sub-pixeling accuracy.

Riehmann Edge Detection

Riehmann edge detection within a defined search area and search direction. Configuration settings define the search area (statically or dynamically) ,and other settings with sub-pixeling accuracy.

Edge Count on a Line

Count edges / transitions along a definable straight line Pass / fail evaluation of the edge quantities is also provided. A range of parameter setting are provided, including statically or dynamically defined location and direction of the line search, absolute and warning level pass fail criteria.

Edge Count on a Circle

Count edges / transitions along a definable circular search. Pass / fail evaluation of the edge quantities is also provided. A range of parameter setting are provided, including statically or dynamically defined location and direction of the line search, absolute and warning level pass fail criteria.

Contour Tracing

Creates and stores contours, such as from the boundaries of objects.

Contour Match

Compares a selected contour against a stored reference contour and determines the degree of match. Includes ability to set pass/fail and warning level criteria and to evaluate the result based on thos criteria.

Blob analysis, Object count

Tools covering 4 stages of blob extraction and analysis. 1. Determination of gray scale band threshold for the extraction. 2. Extraction of the objects 3. Filtering of the objects based on various criteria. 4. Evaluation of the quantity of resultant objects against definable absolute and/ or warning level evaluation criteria. A range of additional configuration settings are available for each step of the process.

Caliper Horizontal/Vertical

The more basic of two EyeVision caliper tool sets, limited to orthogonal ()horizontal and vertical) search directions. The caliper model provides an extensive range of measurement tools in a simple to understand and configure method. Searches for "first contact" in the search area and search direction of the "jaws" The width, length and location of each point search is defined by it's "jaw" which is defined by the user.

Caliper Any Direction

The most flexible of EyeVision's two caliper tool sets. The caliper model provides an extensive range of measurement tools in a simple to understand and configure method. Searches for "first contact" in the search area and search direction of the "jaws" The width, length, location and direction of each point search is defined by it's "jaw" which is defined by the user.

Best Fit Line

A straight line is created from a variety of objects (best fit to a profile/contour, point sets, lines) via. a variety of methods.

Best Fit Circle

Creates circles from either geometric definitions (such as 3 points, diameter and radius) or best fit t a contour or profile.

Calculate Angle

Measure angles and evaluate for conformance with absolute and warning level tolerances.

Calculate Distance (Point – Line)

Measure distance between two points or a point and other objects. Evaluates the result against absolute or warning level pass/fail criteria.

Calculate Distance (Line – Line)

Measures the distance between a detected edge and a straight line. Evaluates the result against absolute or warning level pass/fail criteria.

Calculate Cross Section

Measure the cross section of an object as transected by a definable probe. A range of configuration options in offered. Evaluates the result against absolute or warning level pass/fail criteria.

Measure Gap Width

Measures inside our outside gap with between objects and profiles. A range of configuration options in offered. Evaluates the result against absolute or warning level pass/fail criteria.

Determination of Bending Point

Determines the bending point or point of curvature of a profile or contour. For example, the point where a straight line transitions to an arc.

Measure Alignment Pin

Determines the largest circle which with fit inside of a set of lines, profiles or other objects. Evaluation against absolution and warning level criteria is also provided.

Register Access to IEEE1394 Bus

Register Access to IEEE1394 / FireWire Camera Register

DXF Import Filter

Imports DXF CAD drawing file and converts it into a gray-scale image. The foreground and background "colors", scaling factor and margin widths for this import process are also configurable in this import tool.