



VisionPro

Vision Software

Product Guide

COGNEX

Vision Software from the World Leader

VisionPro® has been set free. Now you can get the world's top vision software with its robust tool library—no matter what camera or frame grabber you use—even nontraditional sources such as 3D profilers, thermal cameras and X-ray imagers. That means all applications benefit from this broad-based, industrial-grade tool set from Cognex.

- Proven in more than 700,000 installations worldwide, the VisionPro tool library spans all vision needs ... from geometric object location and inspection to identification and measurement.
- Combined with flexible and powerful PC-based development, VisionPro makes it faster than ever to create and deploy solutions for the most challenging machine vision applications.
- VisionPro is fully compatible with Microsoft® Windows® 7 in five languages and also supports Microsoft 64-bit operating systems to meet the demands of larger cameras and greater pixel depth. VisionPro software's framework enables users to switch seamlessly between 32-bit and 64-bit operating systems.

Our customers get more than software when they purchase VisionPro. They get a company focused exclusively on machine vision, with the most comprehensive application experience. Add direct, high-quality worldwide service and support, and it's easy to see why Cognex is the machine vision company that industry relies on.

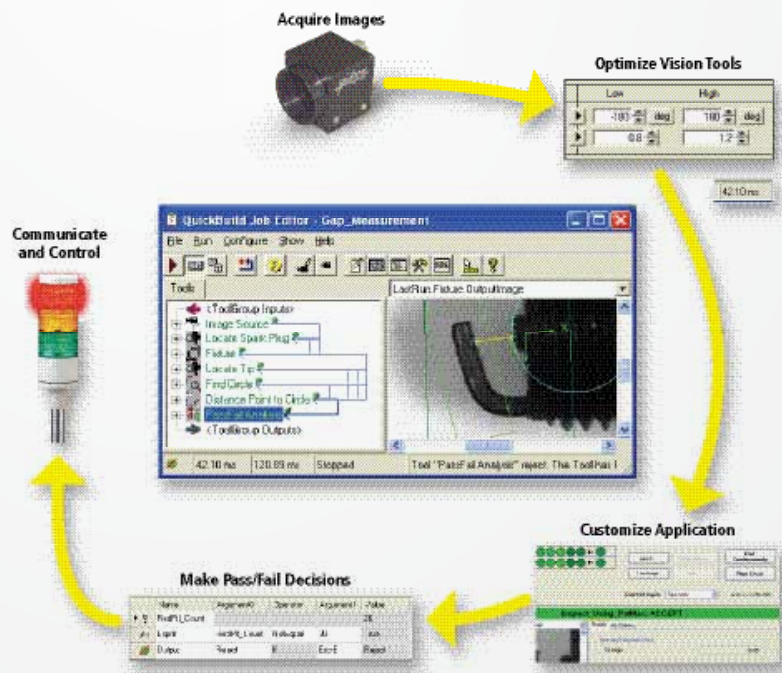
VisionPro software's capabilities set it apart:

- Drag-and-drop linking between tools enables quick communication of values, results, and images
- Intelligent software fixtures position tools dynamically, simplifying tool setup
- Reusable tool groups and user-definable tools shorten development time
- Designed to harness maximum power provided by modern multicore machines
- Supports typical Microsoft® operating systems including Windows® 7 in 32 and 64 bit

Fast and Flexible Application Development

VisionPro offers something for everyone—drag and drop, scripting, or programming—VisionPro seamlessly supports all modes of development. VisionPro QuickBuild™ lets you configure acquisition, select, and optimize vision tools, and make pass/fail decision... all without programming.

OR... develop managed applications with C++, C# or VB.NET. VisionPro has a .NET programming interface which allows programmatic access to all tools using high-level object oriented languages for very efficient development of customized vision solutions. Use QuickBuild to easily load and execute jobs or opt to manually configure your tools by code.



Solutions for All Applications



Semiconductor and Electronics

- High precision alignment
- Board, wafer, and die inspection
- Metrology
- Lead frame inspection
- LED and LCD functional testing



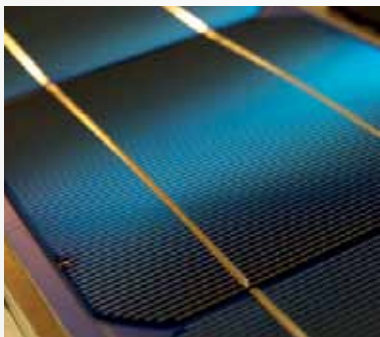
Automotive

- Robot guidance
- Part traceability
- Gauging critical dimensions
- Presence of weld nuts, springs, and fasteners
- Bead tracking for sealants
- Racking and de-racking



Food and Beverage

- Verify date and lot codes
- Picking and packaging
- Label inspection
- Presence of caps, labels, and tamper seals
- Whole package inspection
- Verifying bag closure



Solar

- Silicon crystal, wafer, and cell inspection
- High precision alignment
- Color cell sorting
- Coating inspection
- Panel assembly verification
- Screen print registration



Pharmaceutical

- Verify date and lot codes
- Label inspection
- Whole package inspection
- Sort by color
- Read 1-D and 2-D barcodes
- Verify presence of tamper seals

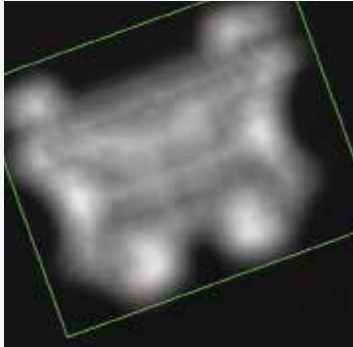


Robot Guidance and Part Location

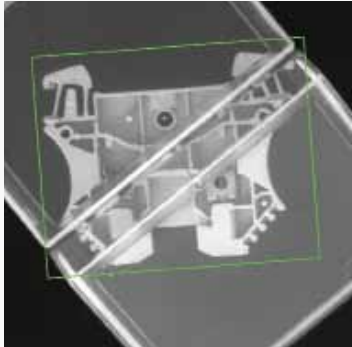
- Part location for automated palletizing
- Locate, identify, and inspect components
- Pick & place on conveyors
- Robotic inspection
- Guide assembly

The Industry Benchmark for Vision Performance

Whether you need vision for inspection or for robotic guidance, VisionPro stands apart from others by offering the industry's most proven, reliable tools. These tools, found only in the Cognex vision tool library, have made VisionPro the industry's benchmark for vision performance.



PatMax-Blurred



PatMax-Occluded

PatMax

The critical tool for object location is PatMax, the patented software tool for part location. PatMax is the industry's gold standard for part and feature location, providing accuracy and repeatability under the most challenging conditions.

PatFlex

PatFlex locates objects despite surface perspective or distortion, enabling the use of tools on complex surfaces.



PatFlex-Trained



PatFlex-Distorted

PatInspect

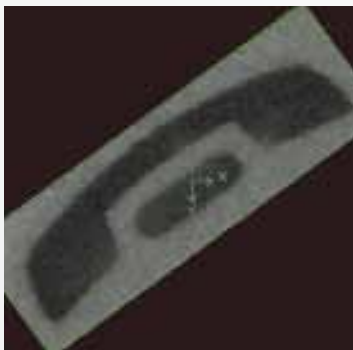
With one-step part location and defect detection using patented algorithms, PatInspect reliably detects flaws even on the edges of parts where other techniques have trouble giving reliable results.

PatMax Synthetic

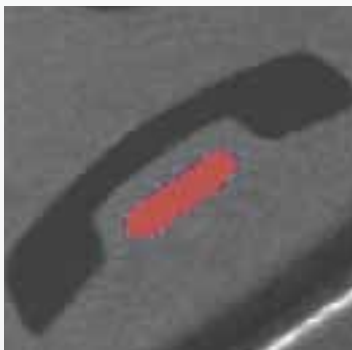
PatMax Synthetic automates model training using CAD data or our unique Model Maker.

PatInspect™ Area

PatInspect Area provides high-accuracy inspection, statistical training and normalization techniques to compensate for lighting variations.



PatInspect-Trained



PatInspect-Defective

PatMax XLC

PatMax XLC finds barely visible patterns in images, reducing the need for expensive lighting and optical systems.

PatMax SA

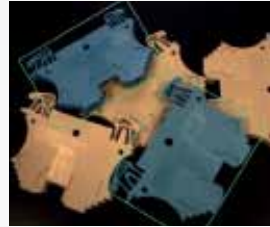
PatMax SA provides accurate results for partial-match alignment when the entire pattern is not present in the image, reducing false rejects.

Vision Power Tools

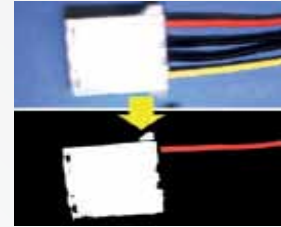
Color Tools

Locate, sort, extract match, identify, and monitor color images

SearchMax™	The ultimate tool to find color samples allowing translation, rotation, scale and skew.
Color Extractor	Simple color definition for complex color scenes. High-speed color extraction for food and packaging.
Composite	Accurately discriminates between subtle Color Match color variations.
Color Match	High-speed identification and sorting of colored parts.
Color Segmentation	Creates a greyscale image from selected colors, enabling other tools to be applied.



SearchMax



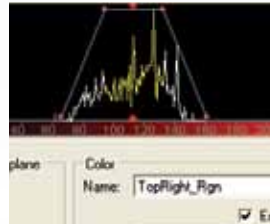
Color Extractor



Color Match



Composite Color Match



Color Definition

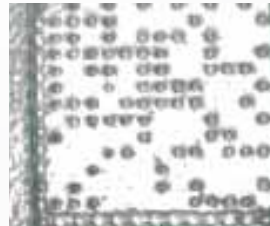


Color Segmentation

Identification and Verification

Achieve optimum ID reading and character verification

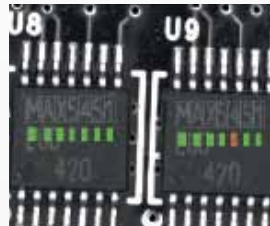
IDMax™	Reads even the most degraded data matrix codes, delivering consistent high read rates needed for part traceability.
Industrial Code	Reads multiple symbologies—without being told how many or which standard—even when codes are randomly positioned and rotated.
2D Symbol	Verifies the quality of 2D symbols Verification using AS 9132.
OCR + OCV	High-speed character reading and verification, even when the print is extremely distorted, using both image-based and printer font-based training.



IDMax



Code Reading



OCR



OCVMax

3D

VisionPro 3D delivers accurate, real-time, three-dimensional position information to automate challenging assembly verification, logistics, and robot applications.



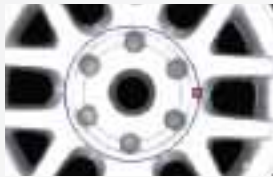
VisionPro 3D



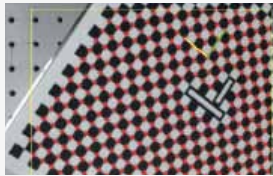
VisionPro 3D

Essential Vision Tools

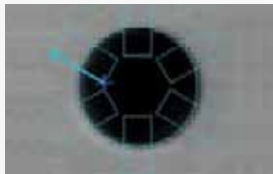
Essential Tools, combined with Power Tools, provide the most comprehensive set of industrial-grade vision tools, optimized to deliver high-speed performance in all applications.



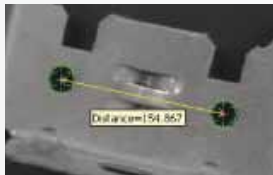
Blob Analysis



Checkerboard Calibration



Find Circle



Measure Geometry



Caliper



Image Processing

Find Geometry	Find lines and circles
Best Fit Geometry	Create best fit lines and circles
Measure Geometry	Measure distances, angles, and intersections
Create Geometry	Construct reference geometry
Blob Analysis	Measure area, size, shape, other geometric properties
Checkerboard Calibration	Correct for non-linear, optical, and perspective distortion
Calibration	Calibrate camera pixels to real-world units
Caliper	Measure sub-pixel location of edges
CNLSearch	Locate an object using normalized correlation
Fixturing	Position tools dynamically, based on location tool results
Sobel Edge Detection	Detect edge location, intensity and direction
Polar Unwrap	"Unwrap" an annular region into a rectangular image
Image Averaging	Create images based on the average of previous images
Grayscale Morphology	Erode, dilate, open, and close
Gaussian Filter	Smooth or sample images
Image Add/Subtract	Add or subtract pixels in two images
Histogram Analysis	Count pixels by gray value
Copy Region	Copy multiple images into a single image
Affine Transform	Rotate, scale, or translate an image
Pixel Mapping	Re-assign the gray value of pixels based on a lookup table
NxM Filters	Convolve, median, erode, dilate, with any filter size
Multiply/Divide	Multiply pixel gray values by a constant
Image Sharpness	Determine the focus of an acquired image
Image Convert	Transform color images for analysis with other tools

Total Hardware Independence

Now you can get the world's top vision software—no matter which camera, frame grabber, or direct-connect digital standard you use.

Support for all image capture needs

Broad Camera Support

VisionPro captures images from hundreds of industrial cameras, covering the complete range of video formats and acquisition requirements. Strategic Cognex relationships with major camera suppliers enable early support of new cameras and technology. VisionPro provides open camera support, as well as configuration and diagnostic tools. This enables customers to configure, analyze, and modify cameras for numerous acquisition platforms.



Acquisition Independence

VisionPro software provides pre-configured, tightly integrated acquisition from both Cognex hardware and direct-connect digital cameras. For images from any other source, such as microscopes or 3rd-party frame grabbers, VisionPro provides a flexible acquisition architecture. This allows customers and vision partners to develop custom interfaces for any programmable image source.

Direct-Connect Technology

FireWire® and GigE Vision® acquisition provide a broad range of digital cameras with attractive features and high performance. Direct-connect technology takes advantage of the latest PC architectures to provide reliable image acquisition without a traditional frame grabber.

Frame Grabber

Both Camera Link® and analog frame grabbers can be used with VisionPro. This provides fail-safe image capture with image buffers, advanced error detection, and dedicated multi-channel hardware.

Acquisition Alliance

Cognex maintains strategic relationships with major camera suppliers through our Acquisition Alliance program. Through the Acquisition Alliance, Cognex establishes cooperative sales and marketing efforts and strong technical relationships, leading to rapid integration of new cameras with VisionPro. Cognex supports hundreds of industrial cameras and video formats covering the complete range of acquisition requirements typically used in machine vision.



Companies around the world rely on Cognex vision and ID to optimize quality, drive down costs and control traceability.

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