



DENSO

THE FLEXIBLE STANDARD SOLUTION

ORiN *Vision*

ORiN VISION VISION LIBRARY FOR ORiN 2

EASY DEVELOPMENT Program robot vision applications with conventional language (VB, C++, C#, etc.)

OPEN CV Built-in processing functions by using OpenCV

COST EFFECTIVE And high-level image processing functionality

HARDWARE INDEPENDENT Connect any off shelf camera of your choice (analog / USB / IEEE1394, etc.)

START TODAY All you need is ORiN Software and PC Camera

GET FASTER Short development time



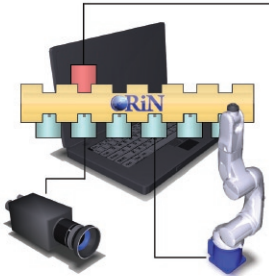
DENSO

ORiN VISION

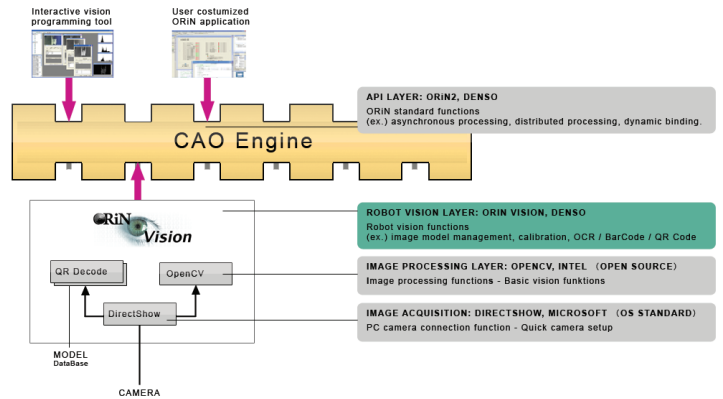
Sample Program

```

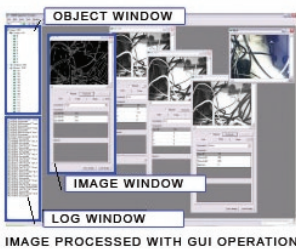
Create CAO object
Set rc = Cao.AddController("rc", "CaoProv.DENSO.Network", "",
"Conn=eth:192.168.0.1")
Set robo = rc.AddRobot("vp")
Set vis = Cao.AddController("cv", "CaoProv.OpenCV", "", "")
Set rawImg = vis.AddFile("cam1", "ID=1")
Set tmpImg = vis.AddFile("mem1", "ID=101")
' Perform pattern matching to search and trace the target object
OldX = -1: OldY = -1
Do
  ' Calculate threshold level by discriminant analysis method
  iT = rawImg.AutoThreshDiscrim(rawImg.CalcHistEx(255))
  ' Binarization & B/W inversion (1)
  rawImg.ThresholdEx 101, iT, 255, 1
  ' Shape matching
  res = tmpImg.MatchShapes2(11, 2, 0.2)
  ' Calculate position shift length and move robot
  If (OldX < -1) Then
    v = "V(" & (OldX - res(0)) & "," & (OldY - res(1)) & ",0)"
    robo.Draw 1, v, "next"
  End If
  OldX = res(0): OldY = res(1)
Loop
  
```



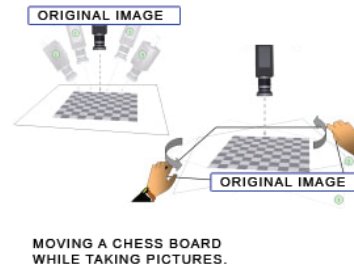
Basic Structure



Interactive vision programming tool



Easy camera calibration function



Functions

Robot vision calibration	Complete 3D calibrating including calculating of distortion coefficients
Stereo vision	For 3D vision applications – triangulation (binocular, trinocular)
Interactive vision programming tool	Interactively apply image processing on GUI
OCR, QR code detection	Decoding OCR, QR code etc.
Image capture	Analog, USB, Firewire, etc. – connect up to 10 cameras
Image pre-processing	Edge detection, threshold, filters, smoothing, etc.
Image processing	Histogram, ROI, channel processing, edit operations, etc.
Recognition	Shape, template, contour, etc.
Measurement	Area, angle, etc.
Blob analysis	Area, perimeter, moments, orientation, etc.

System requirements

- OS: Windows® 2000 SP4, XP SP1 or later, Vista
- CPU: Intel Pentium® III, 1 GHz or faster
- RAM: Minimum 512 MB
- HDD: 500 MB of free space or more
- ORiN2 SDK: Full-set version or runtime version

OpenCV is an image processing library developed by Intel Corporation.
ORiN is a registered trademark of Japan Robot Association.