



## ***Line profile Edge detection***

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Based on:

**NI Vision Assistant Tutorial**

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**Line profile → important part of Edge detection procedure**

For grayscale images, the step displays the **grayscale distribution along a line** of pixels in an image. For color images, the step displays the pixel distribution along a line for **each plane of the selected color model**. Using the **Line Tool**, **Broken Line Tool**, or **Freehand Line Tool** from the toolbar, click and drag to draw a line segment.

**Line Profile**

Mapping Mode	Minimum Value:	43,00
<input checked="" type="radio"/> Linear	Maximum Value:	145,00
<input type="radio"/> Logarithmic	Mean Value:	74,78
	Std Deviation:	41,06
	Number of Pixels:	124

**Line Profile Setup**

Color Model	RGB
Mapping Mode	<input checked="" type="radio"/> Linear
	<input type="radio"/> Logarithmic
Red	[Plot]
Green	[Plot]
Blue	[Plot]

**Line Profile**

Color Model	RGB
Mapping Mode	<input checked="" type="radio"/> Linear
	<input type="radio"/> Logarithmic
Red	[Plot]
Green	[Plot]
Blue	[Plot]

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**Edge Detection: identifies boundaries that define an object.**

**Edge** - discontinuity in the intensity of the image color.

To measure the distance between edges

To control a geometrical constraint → e.g. to control the shape of component

An edge detection operation is available for images represented in the "grayscale".

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Edge Detection: identifies boundaries that define an object.

1 Search Lines      2 Edges

**Figure 6-5.** Edge Detection with a Line Profile

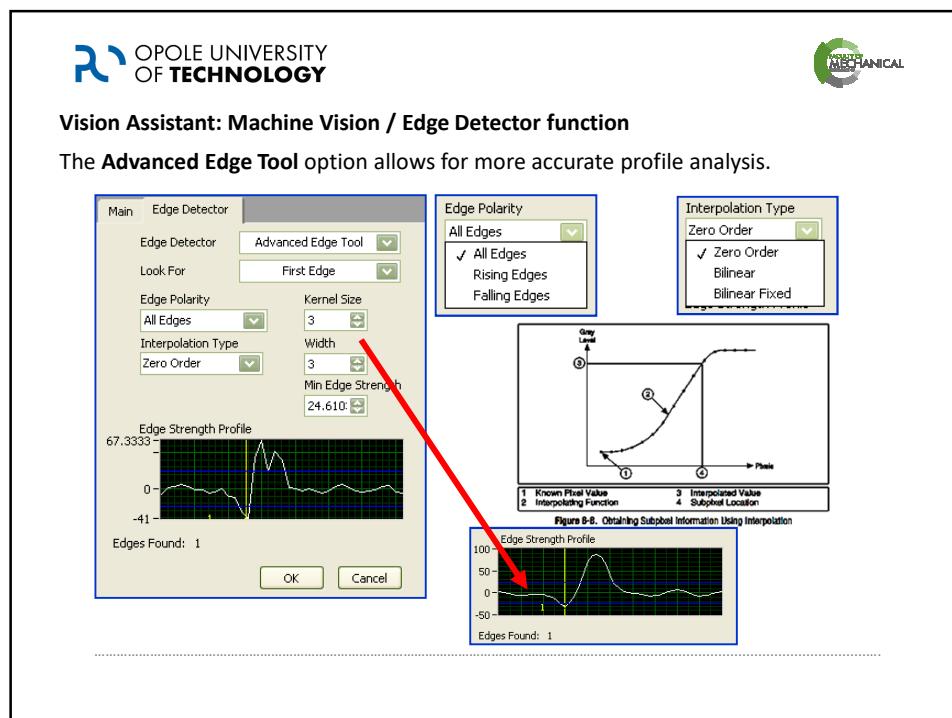
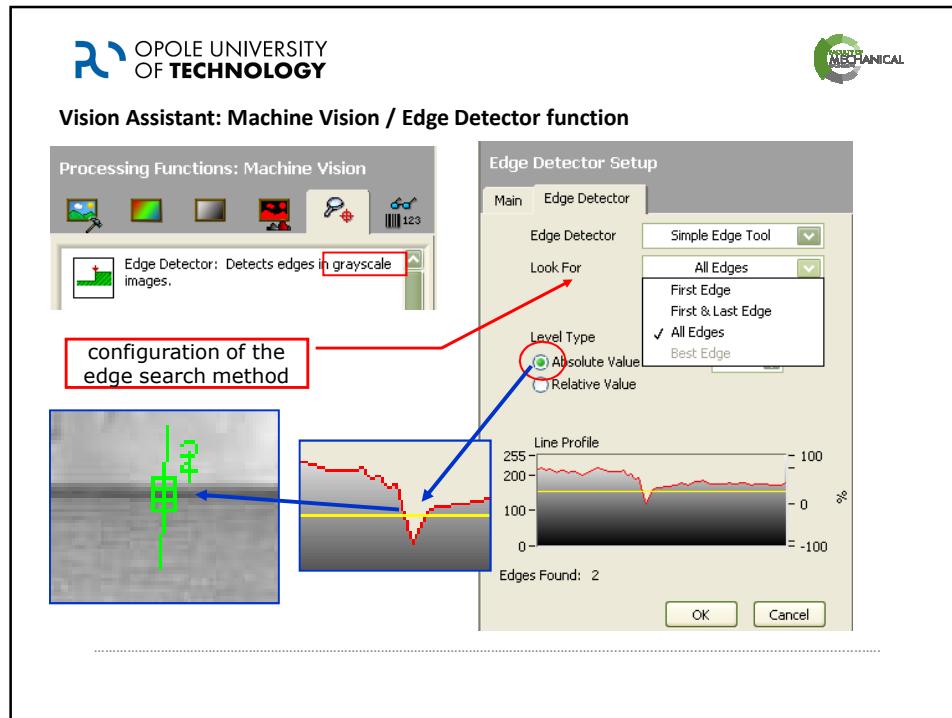
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Edge Detection: parameters.

1 Grayscale Profile	3 Hysteresis	5 Falling Edge Location
2 Threshold Value	4 Rising Edge Location	

**Figure 6-6.** Simple Edge Detection



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**Vision Assistant: Machine Vision / Find Straight Edge function**

Find Straight Edge Setup

Main Settings Advanced Results

Direction: Left to Right  
Edge Polarity: All Edges  
Look for: First Edge

Auto Setup  
Minimum Edge Strength: 10  
Kernel Size: 3  
Projection Width: 1  
Gap: 11

Edge Strength Profile Search Line Index: 1

OK Cancel

Find Straight Edge 2

Find Straight Edge 1

1. Annular Search Region 3. Detected Edge Points  
2. Search Lines 4. Circle Fit to Edge Points

1. Search Region 3. Detected Edge Points  
2. Search Lines 4. Line Fit to Edge Points

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**Vision Assistant: Machine Vision / Clamp function**

Automatically detect edges and perform distance measurement.

Processing Functions: Machine Vision

Clamp (Rake): Measures the distance separating object edges.

Search Lines

Process Edge Strength: 54  
Gap: 5

Clamp (Rake) 1

Clamp (Rake) Setup

Main Clamp

Search Lines

Process Edge Strength: 54  
Smoothing: 4  
Steepness: 2

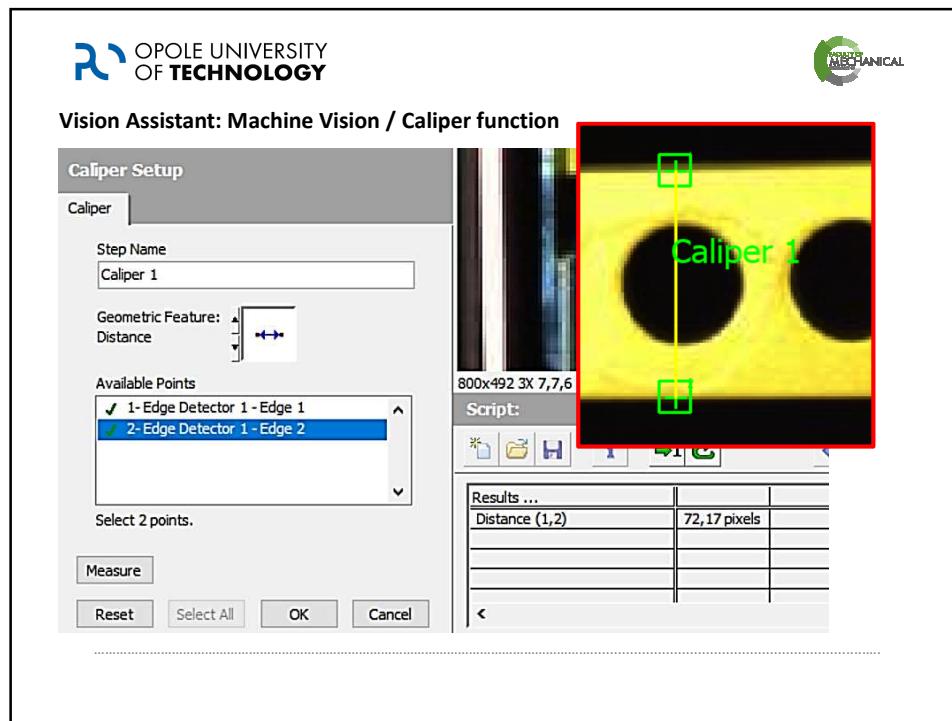
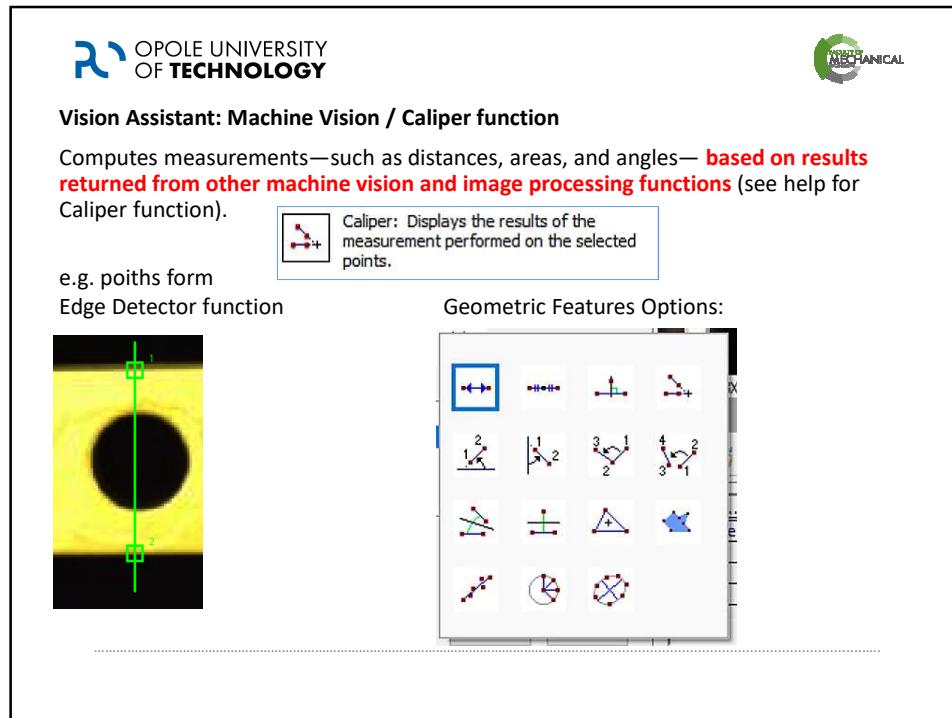
Edge Strength Profile

84  
50  
25  
0

Current Distance (Pixels): 49.49

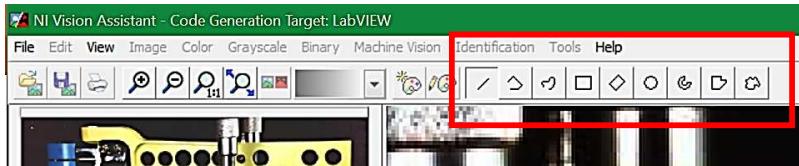
OK Cancel

Search Lines - Process options



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**Vision Assistant: ROI – Region Of Interest**



ROI is treated as "**sub-picture**" (subimage). It does not contain data from the image, but only stores information about the location **in the area** of the analyzed image.

ROI is used to determine the analysis area within a larger image → smaller region = faster analysis.

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**Vision Assistant: ROI – Region Of Interest**

**Table 6-1. NI Vision ROI Tools**

Icon	Tool Name	Function
cursor icon	Selection Tool	Select an ROI in the image and adjust the position of its control points and contours. Action: Click ROI or control points.
crosshair icon	Point	Select a pixel in the image. Action: Click the position of the pixel.
line icon	Line	Draw a line in the image. Action: Click the initial position and click again at the final position.
rectangle icon	Rectangle	Draw a rectangle or square in the image. Action: Click one corner and drag to the opposite corner.
oval icon	Oval	Draw an oval or circle in the image. Action: Click the center position and drag to the required size.
polygon icon	Polygon	Draw a polygon in the image. Action: Click to place a new vertex and double-click to complete the ROI element.
freehand icon	Freehand Region	Draw a freehand region in the image. Action: Click the initial position, drag to the required shape and release the mouse button to complete the shape.
annulus icon	Annulus	Draw an annulus in the image. Action: Click the center position and drag to the required size. Adjust the inner and outer radii, and adjust the start and end angle.

