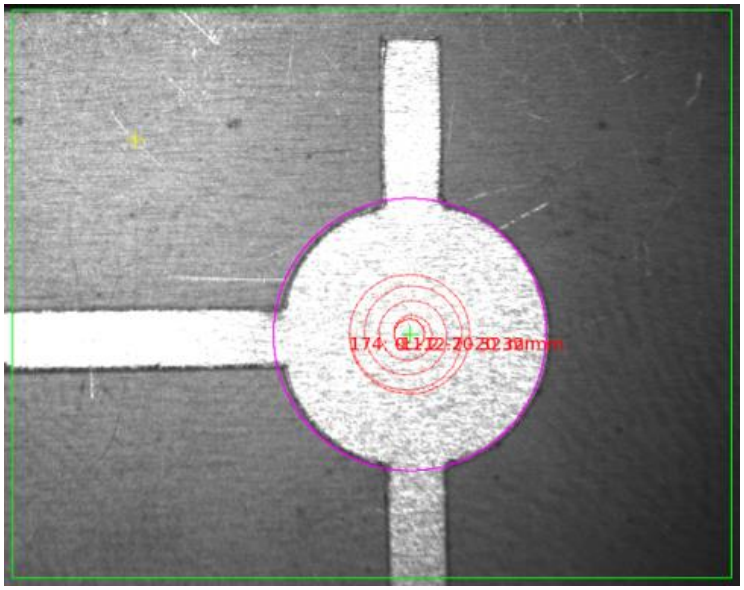
Precitec Graph Documentation

Detection: Circle Hough

Changelog

Date	Version	Autor	Tested on	Description
2023-03-03	A	Wre	5.19.13	New documentation

Description



Detects a Circle using a Hough Algorithm. Can detect circles with various radii. Has a built-in plausibility check. Loads the welding figure and displays it on the center of the circle.

- **Parameter**

G00 ROI from Seam Details			
NAME	**DEFAULT VALUE**	Description	UserLevel
00 Dynamic ROI → Green channel	**255**	Green color of ROI Box	Operator
00 Dynamic ROI → Red channel	**0**	Red color of ROI Box	Operator
00 Dynamic ROI → Blue channel	**0**	Blue color of ROI Box	Operator
00 Dynamic ROI → Verbosity	**Low**	Visibility of ROI Box	Operator
00 Dynamic ROI → Alpha Channel	**255**	Transparency of ROI Box	Operator
G01 Search Radius range			
NAME	**DEFAULT VALUE**	Description	UserLevel
00 min Radius [mm]	**2**	Radius search start value in mm.	Operator
01 max Radius [mm]	**3**	Radius search end value in mm.	Operator
G02 Circle Detection using Hough			
NAME	**DEFAULT VALUE**	Description	UserLevel
00 Downsampling → Verbosity Level	**None**	Visibility of downsampling	Admin
00 Downsampling → Jumping distance	**1**	Jumping distance while downsampling	Admin
00 Downsampling → Tile size	**1**	Tile size to downsample	Admin
01 Median → Verbosity Level	**Low**	Visibility of smoothed image	Admin
01 Median → Filter Length	**3**	Filter radius to be averaged on	Admin

02 Edge Detection → Verbosity Level	**None**	Visibility of edge detection operation	Admin
02 Edge Detection → Method	**Sobel**	Algorithm used for edge detection	Admin
02 Edge Detection → Scaling	**0**	Scale factor of edge detection operation	Admin
03 Circle Hough → Verbosity Level	**Low**	Visibility of circle detection	Admin
03 Circle Hough → Radius Step	**5**	Radius increase steps in pixel	Admin
03 Circle Hough → Number of max	**5**	Maximum amount of steps to increase radius	Admin
03 Circle Hough → IntensityThreshold	**80**	Grey level threshold to detect edges of a circle	Admin
03 Circle Hough → ScoreThreshold	**-1**	Threshold for matching score. Scores lower than the threshold are not accepted detections. -1 equals to no score threshold enabled	Admin
03 Circle Hough → SearchOutsideROI	**0**	Allow the algorithm to search for circles outside the ROI	Admin
G03 Offsets			
NAME	**DEFAULT VALUE**	Description	UserLevel
01 Offset X [mm]	**0**	Offsets the detected position by the amount of the input in mm in X-direction.	Operator
02 Offset Y [mm]	**0**	Offsets the detected position by the amount of the input in mm in Y-direction.	Operator
G04 Plausibility			
NAME	**DEFAULT VALUE**	Description	UserLevel
00 minimal Matching Score	**50**	If the Matching Score Output of the circle detection (value between 0 and 100) is above this value, the detection is plausible. If it is below	GroupLeader

		this value the detection is not plausible.	
G05 Load Figure from File			
NAME	**DEFAULT VALUE**	Description	UserLevel
00 ContourFromFile → WeldingFigure name	**0**	Number of Welding figure to weld.	Operator
01 Rotation angle → Number	**0**	Angle in degrees by which the figure should be rotated.	Operator
02 Stretch in X → Number	**1**	Factor by which the figure should be stretched in X-direction.	Operator
03 Stretch in Y → Number	**1**	Factor by which the figure should be stretched in Y-direction.	Operator
04 SeamWeldingResult → Verbositiy	**Maximal**	Visibility of the Preview	Operator
G06 Buffer			
NAME	**DEFAULT VALUE**	Description	UserLevel
01 X Buffer → Slot number	**1**	Writes the detected X-Pos [mm] into the Buffer.	GroupLeader
02 Y Buffer → Slot number	**2**	Writes the detected Y-Pos [mm] into the Buffer.	GroupLeader
04 Contour Buffer → Slot number	**4**	Writes the Contour into the Buffer.	GroupLeader
09 Plausibility → Slot number	**9**	Writes the Plausibility into the Buffer.	GroupLeader
G08 Send end of seam marker after xx images			
NAME	**DEFAULT VALUE**	Description	UserLevel
00 Image number xx → Number	**0**	Image number on which the seam shall end (first image number = 0)	Operator

Output Buffers

Value	Slot Number
X Pos [mm]	1
Y Pos [mm]	2
Contour	4
Plausibility 0 = good Plausibility 1 = bad Plausibility	9

Results

Value	Result Enum	Result Name
X Pos [mm]	28	CoordPositionX
Y Pos [mm]	29	CoordPositionY
Radius [mm]	734	Radius [mm]
Matching Score – Value between 0 and 100	1009	Surveillance 1
Plausibility 0 = good Plausibility 1 = bad Plausibility	555	Plausibility error