Circle Detection

Version 1.0

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Introduction

This package is a Matlab based software aiming at accurate detection of full circle on gray level images. To know more about the software / algorithm, please contact author directly.

Algorithm is designed by Jun Ye and implemented by HJ.

Environment Settings and Installation

This software requires Matlab (version 7.0 or higher) and it supports Windows, Linux and Mac OS X systems.

For installation, please copy all the files and subfolders to the same directory and add their path to Matlab environment.

How to use & Limitations

- **How to generate pre-computation files**

  Pre-computation files are stored in 'Pre-Compute' folder. If more pre-computation files are needed, user can specify parameters in 's_createPreComputation.m' and run it. Or, user can also call function 'cdSincCircleIntegration' to generate files.

- **How to perform circle detection**

  Circle detection can be done by function 'cdCircleDetectionByMinimum' or 'cdCircleDetectionByGradient'. As their names suggest, they correspond to circle detection by minimum CGL and maximum gradient respectively.

For more information about usage of these two functions, such as inputs and outputs format, please type ‘help cdCircleDetectionByMinimum’ or ‘help cdCircleDetectionByGradient’ in Matlab command window.

User can also take ‘s_testCircleDetection.m’ as a starting example.

- **Limitations**

Currently, circle detection can only be performed on gray level images. RGB image will be automatically transformed to gray and no other formats are allowed.

Also, the program requires a relatively accurate estimation of center and radius as inputs. By default, the estimation should fall within 5 pixel around the true value.

Also, the program has only been tested for images with same height and width. If this requirement is not met, it can be problematic.

FAQ

- What’s the space consumption for pre-computation?

  It depends on the size of the image. For all radius in 128-by-128 image, the pre-computaion file is around 8M.

- Why sometimes it fails?

  The most common reason is that the estimation of input is too far away from the true value. Please give a more accurate estimation and try again.