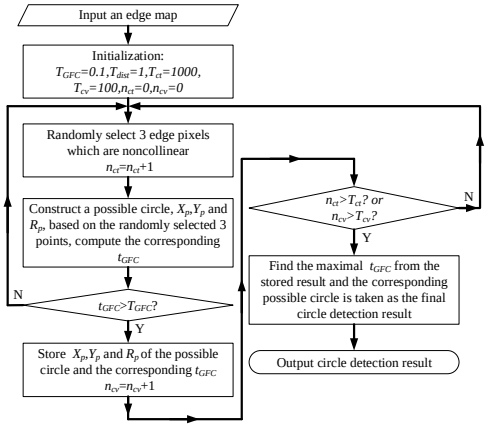
A Fast single circle detection algorithm IRCD

IRCD is an improved version of randomized circle detection (RCD) [1] for single detection. For the former, fewer parameters need to be set manually. The flowchart of the proposed IRCD is given as



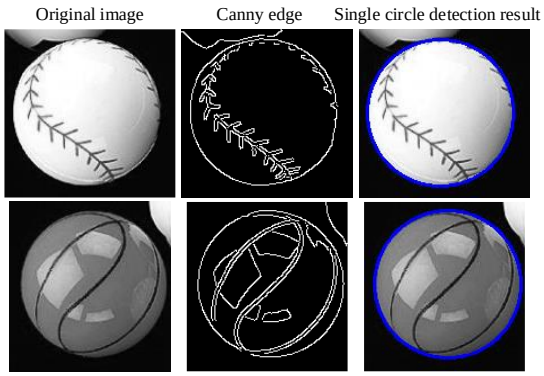


Fig. 1 The flowchart of IRCD

Fig. 2 The results of single circle detection with IRCD

T_{GFC}, T_{ct}, T_{cv} and T_{dist} are thresholds by manually set. X_p,Y_p and R_p denote the central x, y coordinates and radius of a possible circle. More details about the proposed IRCD algorithm can be obtained in literature [2].

In this given example, the basic processes are:

Input image -> step 1: image filtering -> step 2: canny edge detection -> step 3: single circle detection with IRCD –> Output the result of circle detection.

The tested images, canny edge detection and results of single circle detection with IRCD are shown in Fig. 2.

References：

[1] T. C. Chen and K. L. Chung, “An efficient randomized algorithm for detecting circles,” Computer Vision and Image Understanding, vol. 83, no. 2, pp. 172–191, 2001.

[2] X. Zhou, Y. Wang, Q. Zhu, J. Mao, C. Xiao, X. Lu, H. Zhang, “A surface defect detection framework using visual attention model and wavelet transform for glass bottle bottoms,” IEEE Transactions on Industrial Informatics. [under review](https://****), pp. **, 2019.