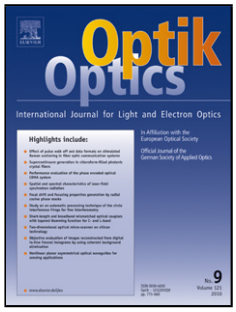

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Fast circle detection algorithm based on sampling from difference area

Lianyuan Jiang[a,b,c], Zhiwen Wang[b], Yongqiang Ye[a,*], Jianbing Jiang[a,b,c]

[a]College of Automation Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing 210016, China

[b]College of Computer Science and Communication Engineering, Guangxi University of Science and Technology, Liuzhou 545006, China

[c]Guangxi Experiment Center of Information Science, Guilin 541004, China

[*] Corresponding author. Tel.: +86-25-84892305-6020; fax: +86-25-84892368.

E-mail address: melvinye@nuaa.edu.cn (Y. Ye).

Abstract: The detection of circular targets is a basic problem in computer vision, especially in pattern recognition. Due to the low effective sampling rate, circle detection methods based on random sampling (like randomized Hough transform and randomized circle detection algorithm) result in heavy computation load and slow detection speed. Targeted at this problem, this paper proposes a fast circle detection algorithm based on the difference area sampling. When a candidate circle is determined to be a false circle, a number of samples are taken from its difference area if the number of points on the candidate circle reaches a certain number. And the sampling efficiency in the difference area is significantly higher than that of the random sampling, thus increasing the speed of the circle detection. A large number of experimental results also validate this advantage. The proposed algorithm has the same detection accuracy and robustness as the original algorithm, and the proposed method of sampling from the difference area boasts great potential in practical application as it can be directly applied to randomized Hough transform, randomized circle detection algorithm and their improved versions.