Circle Detector

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Abstract

We present a deterministic algorithm for rapid computation of circles. The algortihm bases on segment length and contour curvature computation. Then, circle and circular segments are accepted or discarded relying on two criteria: variance of the curvatures through a single segment (in case of isolated segments) and its closeness to the threshold value of 2π (in case of closed ones). We demonstrate its robustness for detecting circle by applying to different scenarios.

1 Introduction

Circles have a well defined mathematical form, *i.e.*

$$x^2 + y^2 = r \,. \tag{1}$$

However, finding them in color images might become difficult since effects as partial occlusion, color intensity variantion or segment cutting might appear. Perhaps the most widely used algortihtm for circle detection is the so-called circular Hough transform. This algorithm base on the mapping of all points $\{x-x_0, y-y_0\}$ whose represensentation on x_0- and y_0-plane intersect at one single point.

2 Methods

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3 Results

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4 Conclusion

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References

[1] Link Creator(s). Link title. https://example.com/.

[2] FirstName LastName. mailto:email@example.com.

[3] Firstname1 Lastname1 and Firstname2 Lastname2. Article title. *Journal name*, Year. https://dx.doi.org/...