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Target Image Matching Algorithm based on Pyramid Model and Higher Moments

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Highlights

- First, image pyramid model is built, where the resolutions of test image and template image are proportionately reduced to reduce the ergodic calculation amount of template.
- And then, template image is moved in per pixel in test image, and the matching coordinate is got through calculations of square error normalization matching-degree function.
- At last, based on Canny edge detection, the template target profile and suspected screw target edge profile in test image are got, besides, the Hu moments of the two profiles are calculated, of which the characteristic against zoom and rotation interference is used to complete shape matching.

Abstract. To solve the problem of long computing time in present target matching algorithm and incorrect positioning on rotating and zooming target, the Paper has proposed a screw target matching algorithm based on Pyramid image structure and Hu moments. First, image pyramid model is built, where the resolutions of test image and template image are proportionately reduced to reduce the ergodic calculation amount of template. And then, template image is moved in per pixel in test image, and the matching coordinate is got through calculations of square error normalization matching-degree function. At last, based on Canny edge detection, the template target profile and suspected screw target edge profile in test image are got, besides, the Hu moments of the two profiles are calculated, of which the characteristic against zoom and rotation interference is used to complete shape matching. The experimental test result shows that: compared with present matching algorithm, the proposed algorithm in the Paper owns a higher real time and accuracy in screw matching positioning.

Keywords: Image matching, Pyramid model, Higher moment, Intelligent identification, Rotation matching