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软件、算法与仿真

# 用同心离散圆簇实现目标形状特征提取

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摘要：

为了满足跟踪过程中目标形状匹配的实时性要求,提出了用同心离散圆簇（cluster of concentric discrete circles, CCDC）进行区域形状特征提取的方法,主要思想是将目标的质心定位在CCDC的圆心上,将目标图形映射到CCDC上,计算每个离散圆的形状特征值,组成一个特征向量来描述目标形状。该方法的优势在于计算量非常小而且受目标形状尺寸影响小,并具有平移、尺度和旋转不变性。计算速度分别是七阶不变矩和Zernike矩的10多倍和300多倍,能很好满足目标跟踪的实时性要求。

关键词： 形状匹配 形状特征提取 同心离散圆簇 七阶不变矩 Zernike矩

## Shape feature extraction using a cluster of concentric discrete circles

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Abstract:

In order to meet the real-time requirement of shape matching in target tracking process, this paper proposes a method of regional shape extraction using a cluster of concentric discrete circles (CCDC). The main idea is to locate the object’s shape center on the center of CCDC, map the shape on the CCDC, and calculate the eigenvalue of each circle and then describe the shape with an eigenvector. The advantage of this method lies in that it is fast in computation and less affected by the object shape and size. Besides, it preserves the properties of translational, scaling and rotational invariance, with a computing speed of 10 times of the moment invariants and 300 times of the Zernike moments. It can well meet the requirements of real-time in tracking process.

Keywords: shape matching shape feature extraction cluster of concentric discrete circles (CCDC) seven-order moment invariant Zernike moment

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