基于图像处理的微小塑料齿轮轮廓优化

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关键词： 微小塑料齿轮 图像分割 边缘滤波器 轮廓优化

摘 要： 通过计算机视觉系统的构成、图像预处理、图像分割和数字图像的像素连通性理论与技术的研究，提出微小塑料齿轮的二值图像噪声点去除及齿轮轮廓提取方法，用数学形态学方法提出轮廓的简化算法，并给出了关键技术的原理及实现方法。发现通过删除曲线上多余点，可以达到用最少的点来表示一条曲线的目的。实验结果表明，该优化轮廓的简化算法，可获得准确的齿形检测数据，能满足工程测量的实际需要。 On the basis of the studies upon the computer vision system construction and the theories and technologies of the image preprocessing, the segmentation of image as well as the pixels connectivity of digital image, the methods of wiping off the noise points in the binary image of the micro plastic gears and extracting the contour of the gears were put forward. The simplifying algorithm for the contour extracting was raised by the methodology of the mathematical morphology. The principles and the implement of the key technologies of the above algorithm were also presented. It found out that a curvilinear could be represented with the fewest points by deleting the unassociated points. At last, the experiments have showed that the inspection dates of the tooth profile could be obtained accurately by the simplifying algorithm of contour optimization and the algorithm could meet the needs of the virtual engineering inspection.

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