

逆向工程中数据精简技术的研究

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摘要 由于激光扫描技术的进步, 可以方便地以较高精度和速度获取零件模型表面信息, 对于产生的大量扫描数据, 需要对其进行精简处理. 为此提出了自适应最小距离精简方法, 首先通过中值滤波和小波包滤波实现数据点的噪声去除, 然后通过曲率分析, 实现数据点云区域分割, 对于分割后的区域选用不同的距离准则, 如果数据点间的距离小于设定的准则, 则该点删除从而实现数据精简. 自适应最小距离法不仅保留了造型所需数据点的精度, 同时数据精简效率为36%, 最后通过实例验证了该方法的有效性.

关键词 [逆向工程](#) [曲率分析](#) [最小距离方法](#) [数据精简](#)

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Point data reduction technique in reverse engineering

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Abstract

Advances in laser scanning technologies have facilitated sampling part surface data with speed and accuracy. It is necessary to manipulate these large amounts of point data. The adaptive minimum distance (AMD) method is proposed in this paper which is a kind of data reduction algorithm that balances efficiency and precision. Firstly the noise data is eliminated by median filtering and wavelet packet filtering, and then the curvature of the point data are analyzed and different zones are separated where a suitable minimum distance is selected. The points where the distance is larger than the given distance are neglected. This novel algorithm has merits of both precision and efficiency with the ratio of reduction being 36%. The method is applied to two sample models, and experimental results illustrate the feasibility of the new algorithm.

Key words [reverse engineering](#) [curvature analyzing](#) [minimum distance method](#) [data reduction](#)

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