

基于非均匀细分的散乱点云数据精简算法 Algorithm of Scattered Point Cloud Data Reduction Based on Non-uniform Subdivision

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摘要: 针对海量散乱点云数据精简问题, 提出了基于非均匀细分的精简算法。采用八叉树结构对点云数据进行空间分割, 由分割结果建立k邻域。对k邻域内的散乱点进行二次曲面拟合, 以拟合曲面的平均曲率为判据决定是否对八叉树空间实行非均匀细分, 细分过程中由数据点之间的最大间隔角决定细分程度。构造曲率差函数, 识别出边界数据点, 对其进行数据保护。该算法对具有曲率多样化特点的点云数据的精简具有实用性, 通过实验验证了该算法的可靠性和准确性。For reduction of scattered point cloud data, one algorithm based on non-uniform subdivision was put forward. The space partition of point cloud was generated using octree structure. k neighborhood was constructed through partition result. All the points in the k neighborhood were approximated by quadratic parametric surface of which the mean curvature determined whether to carry out non-uniform subdivision for the octree space or not. In the process of subdivision, the degree of subdivision depended on the maximum interval angle of each data point. Boundary points were identified and protected by constructing curvature difference function. The algorithm was applied for reduction of point cloud with curvature diversification. The reliability and accuracy of the algorithm were validated by experimentation.

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