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信息科学

# 改进的NURBS曲面片拼接算法

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摘要： 研究了已网格化的曲面片之间的拼接技术并对现有的拼接算法进行了改进。首先，根据哈特利-贾德的弦长参数化算法求取非B样条（NURBS）曲线上的节点向量,利用节点向量和曲线反求出控制顶点，并采用投影变换的方法求出权因子。其次，根据要求调整的控制顶点，使曲面片之间达到G1连续。最后，再对已拼接好的曲面片上的控制顶点进行整体修改，重新排列整张曲面片上的控制顶实现曲面片的无缝拼接。用专业的三维造型软件对拼接后合并的曲面片进行了测试，结果表明，该方法在保证曲面片之间G1连续的情多块曲面片实现无缝拼接，无缝拼接试验中的平均误差为0.0049°。

关键词： 非均匀有理B样条 曲面片 无缝拼接 曲面片算法

# Improved curve surface seamless splicing based on NURBS

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Abstract: This paper researched a splicing technology for gridded curve surfaces and improved the existing spl algorithms. On the basis of Hartley Judd chord length parameters. the joint vectors on Non-Uniform Rational B-(NURBS) curves were gotten. Then, joint vectors and curves were used to calculate control peaks with a revers method and the projection transformation means was taken to obtain the weight factors. Furthermore, the cor peaks on splicing surfaces were adjusted based on the requirements to allow the curve surfaces to reach G1 continuity. Finally, control peaks on gridded curve surfaces were modified wholly and they were rearranged to the curve surfaces seamlessly. The curve surfaces after splicing were measured by a special 3D software, and results show that the method can splice multiple surfaces into a whole under a condition of continuous G1, and average error is 0.0049° in experiments.

Keywords: Non-uniform Rational B-spline(NURBS) curve surface seamless splice curve surface algorithm

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