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论文

# 基于退火遗传算法的NURBS曲线逼近

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摘要：

利用退火遗传算法实现任意阶、任意节点数的非均匀有理B样条(non uniform rational b-spline, NURBS)曲线逼近型值点序列。首先将NURBS曲线的控制顶点、权、节点序列和逼近型值点的t参数序列用浮点数编码为基因个体，然后通过循环执行交叉算子、变异算子和退火选择算子求解寻找最优解或者次优解。最后用四种不同控制顶点数和次数的NURBS曲线逼近同一个型值点序列,给出了四种不同条件下的数值结果和图形。实验结果表明通过退火遗传算法能够稳定地用不同次数和控制顶点个数的NURBS曲线逼近型值点序列。

关键词： 退火遗传算法　NURBS曲线　逼近

# NURBS curve approximation based on annealing genetic algorithm

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Abstract:

The annealing genetic algorithm is presented to approximate a sequence of characteristic points by NURBS curve with any order and any number of knots. First, the control vertices, weights of NURBS curves, knots sequence and t parameters approximating characteristic points were encoded as genes. Then the cross operator, mutation operator and annealing selection operator were executed cyclically to search the global optimum or the sub optimal. In the end, four NURBS curves with different number of control vertices and degree were used to approximate the same sequence of characteristic points. Four groups of numerical values and four graphics in different condition were presented. The example proves that the annealing genetic algorithm can stably approximate the NURBS curves with different degree and number of control vertices.

Keywords: annealing genetic algorithm　non uniform rational b-spline curve　approximation

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