图像处理

基于退火遗传算法的少数投影CT图像重建

丁泽慧,陈韶华

湖北大学物理学与电子技术学院，武汉430062

摘要　　不完全投影重建算法研究是当今图像重建算法中的一个难点问题，近年来，
遗传算法在其中有一定的应用，但还存在一些问题。针对遗传算法在优化中的不足
(如早熟收敛及易陷入局部最小等)，将模拟退火机制引入到遗传算子中，
提出一种新的算法；并通过选择测试函数，建立将该算法应用于不完全投影图像重建的优化模型，
进行计算机模拟。通过对从投影角间距为15°的12个不同投影视角方向获取的投影数据进行分析，结果表明，
该算法的重建图像具有较高的精度。

关键词　　不完全投影　遗传算法　模拟退火

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Image reconstruction algorithm for CT from fewer views based on simulated annealing genetic algorithm

DING Ze-hui,CHEN Shao-hua

College of Physics & Electronic Technology, Hubei University, Wuhan 430062, China

Abstract Algorithm of projection reconstruction from fewer views is a puzzle in the field of image reconstruction, genetic algorithm is one of these algorithms applied in this field, but there are some disadvantages in it. In order to overcome these disadvantages existing in optimization process, such as premature convergence, simulated annealing was introduced into genetic algorithm and a new algorithm was created. By selecting test function, an optimized model for incomplete projection image reconstruction was built based on this algorithm. The computer simulation results indicate that this new algorithm could achieve accurate image reconstruction with data obtained from evenly distributed 12 projection angles of 15°.

Key words incomplete projection　genetic algorithm　simulated annealing

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通讯作者　丁泽慧 dingzehui2004@yahoo.com.cn