

论文

## 双层约束下基于局部和全局信息的图像插值新模型

仵冀颖, 阮秋琦

北京交通大学信息科学研究所 北京 100044

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摘要

该文提出一种双层约束的图像插值模型, 模型在原始未插值图像梯度模约束下同时基于局部和全局信息处理。使用偏微分方程处理边缘像素, 锐化边缘同时平滑边缘块状效应; 平滑区域像素点的插值操作使用非局部均值模型, 非局部均值模型通过对原始图像全局信息加权平均得到待处理图像像素值, 图像平滑。使用双层约束模型处理纹理图像可以保持纹理特征, 平滑纹理部分线形特征位置的块状效应。最后理论和实验结果证明使用双层控制模型可以直接将噪声图像插值放大。

关键词 [图像插值](#) [偏微分方程](#) [非局部均值](#) [双层约束](#)

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## A Two-layer Constraint Image Interpolation Model Basing on Both Local and Global Information

Wu Ji-ying, Ruan Qiu-qi

Institute of Information Science, Beijing Jiaotong University, Beijing 100044, China

Abstract

In this paper, a novel two-layer constraint image interpolation model is proposed. The novel model interpolates image under the constraint of gradient magnitude in original un-interpolated image. The edge pixel is processed by Partial Differential Equation (PDE). PDE enhances edge and smoothes jaggies in the edge. The pixel in smooth regions of under-interpolated image is processed by Non Local (NL)-means model. NL-means model gets gray value of pixel by weighted averaging global information in image and image is smoothed. Texture image interpolated by the novel model preserves the entire texture pattern; the jaggies in linear structure of texture is smoothed too. It is even proved by theory and experiments that noisy image can be interpolated directly to the required size using this novel model.

Key words [Image interpolation](#) [Partial Differential Equation \(PDE\)](#) [Non-local means](#) [Two-layer constraint](#)

DOI:

通讯作者

作者个人主页 仵冀颖; 阮秋琦

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