

数学与系统科学研究院

计算数学所学术报告

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报告题目:

**The New Encoding and Decoding
Algorithms in Fractal Image
Compression**

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报告时间: **2014 年 10 月 27 日 (周一)**

下午 16:30-17:30

报告地点: 数学院南楼五层 **514**
会议室

Abstract:

Adaptive Search is one of the fastest fractal compression algorithms and has gained great success in many industrial applications. By substituting the luminance offset by the range block mean, we create a completely new version for both the encoding and decoding algorithms. In the paper, theoretically, we prove that the proposed decoding algorithm converges at least as fast as the existing decoding algorithms using the luminance offset. Also, we prove that the attractor of the decoding algorithm can be represented by a linear combination of range-averaged images. These theorems are very important contributions to the theory and applications of fractal image compression. As a result, the decoding image can be represented as the sum of the DC and AC component images, which is similar with Discrete Cosine Transform or Wavelet Transform. In order to further speed up this algorithm and reduce the complexity of range and domain blocks matching, we propose two improvements in this paper, i.e. employing the post-quantization and geometric neighboring local search to replace the currently used pre-quantization and the global search respectively. The corresponding experimental results show the proposed encoding and decoding algorithms can provide a better performance compared to the existing algorithms.

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