Fractal Image Compression

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Fractals are complicated looking images that arise from simple algorithms. These images are generated by *iterative* execution of simple algorithims, at different scales. This property of being same at different levels is called *self-similarity*.

Compression is a method that allows images to be stored on computers using much less memory than the original image. In *lossless* compression we can exactly reconstruct original images from their compressed versions. In *lossy* compression, only approximate but not exact, reconstruction is possible.

Fractal Image compression is a method where we use the self-similar nature of an image, to encode it in a way that would require less storage space. This same self-similar property is used to reconstruct the image. Fractal image compression is lossy in that the coding and decoding process degrades image quality somewhat.

An implementation of fractal compression using *Quad-tree* encoding already exists [1], and this project proposes to implement a suggested improvement to the algorithm by basing the partition of the quad-tree on the variance, rather than range match [1]. This would result in a reduction in the time required for coding the image, at the cost of extra storage space. An implementation of this improvement to the existing 'C' code is proposed.

References

[1] Yuval Fisher, "Fractal Image Compression, Theory and Application", Springer-Verlag, ISBN 0-387-94211-1, 1994.