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Removal of A Smoke Region Using Maan Iteration Coupled with Cloud Computing

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Abstract: The modeling of natural phenomena such as smoke remains a challenging problem in computer graphics (CG). Cloud computing is the provision of providing dynamically scalable and often virtualized resources as a service Fires produce smoke as well as flames, so detecting smoke from data like surveillance camera images data and make it easier to discover fires early. However, in attempting to discover fires at locations which are hard to see with the human eye, as in cases like forest fires, we are face with a problem in that smoke does not have a determinate form in camera images. Furthermore, the images can be beautified by the computer image manipulation software and append some synthetic art tint, which let fractal images become design materials of ceramics patterns with great quality. The experiment indicates that the new method, compared with the traditional one, makes the ceramics patters have some characters such as better art property, higher quality, richer color and elegant temperament and so on.

Keywords: Cloud computing, fractal encoding, smoke regions.

1. INTRODUCTION

The objects studied by Euclidean Geometry are well-regulated figures, such as circle, square, sphere and cone. The lines or surfaces constructing these figures are smooth and continuous, so artificialities--brick, wheel and building, for example, can be described expediently with these figures. Detections of smokes, when a fire occurs, are crucial to minimizing damages and saving lives. In recent decade, research in detecting smoke using surveillance cameras has become very active as smoke detection, However; we would like to discover flame early from the information in gray scale images, which can be obtained from existing surveillance cameras. The boundary of the smoke region is not clear. Therefore we cannot the smoke region extract by using fundamental image processing. With this technique, we focus on the shape of the smoke, which has properties of fractal and fractal are also used for extract the smoke & dusty region.

Fig. 1. Capturing Region

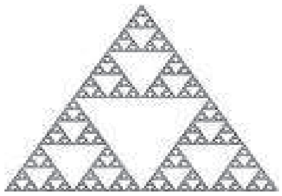

Fig. 2

Today there exists several implementations in multimedia database systems such as the QBIC system by IBM Photo book developed by the MIT Media, and the Virage system developed by Virage Inc. In these, as well as many other approaches, on e defines feature vectors of image properties. Images are considered to be similar if the distance between their corresponding feature vectors, which are supposed to be elements of a given metric space, is small. For Feature Extraction Using Fractal Codes this reason, the discriminating power of the features has to be strong. Features often used are color and texture Furthermore, several authors have suggested to use shape properties, or relative position of objects within an image called spatial similarity. The code, and small region positional relationships determined by the code, is used to evaluate whether an image is smoke. This technique works with cameras which are not color cameras or movie recording cameras, so there is potential for Iqw-cost practical applications.

2. REMOVEL OF SMOKE REGION

Automatic indexing and retrieval of images based on content is a challenging research area. In order to extract the region candidates using fractal encoding, the technique segments the image into regions having the same distinguishing features.

The K-means method is used in this technique. The initial points, which are critical in the K-means method, can be easily obtained from DOMAIN region information corresponding to the RANGE of the code RANGE, DOMAIN) obtained by fractal encoding. First, an image is prepared (Fig. 4) in which the original image (Fig. 3) and all pixels which are the same size are initial points. All pixels are initial points, so the image is completely black. A transformation is applied to map a certain RANGE region onto the corresponding DOMAIN range a code obtained by fractal encoding of this completely black image. At this time, the initial points in the RANGE region are also mapped to the DOMAIN region. Fig. 5 shows an image in which mapping processing from RANGE to DOMAIN has been done once. The initial points in the RANGE region are mapped into the DOMAIN region, and in fig.1shows. 659 is possible to check for overlap of initial points based on the size difference of DOMAIN and RANGE. If this kind of transformation is repeated, overlap with the area mapped to causes the initial point to follow a complex path, and it creates from one to the next. Fig. 6 shows the image after mapping 30 times from RANGE to DOMAIN. When mapping is done repeatedly, changes in the initial points decrease after a fixed number of iterations, so the rough form of the image changes less and less, and it converges onto a fixed image. The reason which has been given for this convergence is that a trapping region is formed in the image [5][7]. A trapping region is a region which has the ability to cause convergence so that once an initial point has entered the region; it can never be mapped outside the region again (Fig. 7). Trapping regions are formed by taking the edge to be the bounded of each region. That is, initial points, which started the map from RANGE to DOMAIN at a different region, so it becomes possible to perform region segmentation by labeling whether each initial point has entered the trapping region. More specifically To handle this, we have proposed a technique in which we segment into sets which contain a certain degree of elements by clustering points, after mapping from RANGE to DOMAIN a fixed number of times, and then regard those clusters as trapping regions [5]. There are a number of clustering techniques, hut here we using the K-means method, which is effective when the shape of the point sets is close to a circular distribution. In the K-means method, appropriate initial points are determined in the image, and the applicable clusters around those initial points are evaluated by their distance, and incorporated with the initial points, and then the process is repeated.In this paper, we find the initial points from the points converged to in mapping from RANGE to DOMAIN. Here, the image is smoothed in order to keep the number of initial points low[7]. The center of gravity of each small region is found, and those points are taken lo be the initial points. The initial points have been found, so region segmentation is performed on Fig. 6 using the K-means method. In this example with the original image (Fig. 3), convergence occurred at 80 iterations (Fig. 9).

Fig. 3. Actual image

Fig. 4. Primarily image

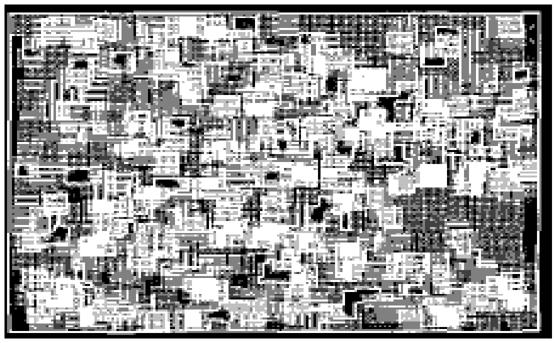

Fig. 5. Domain from range

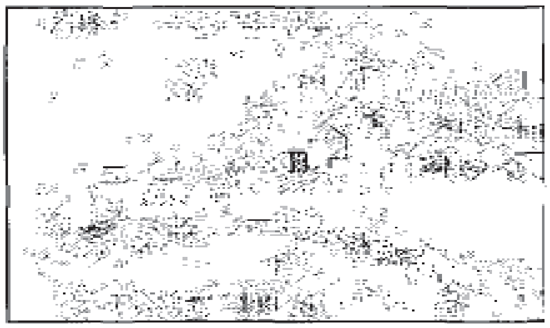

Fig. 6. Map to Domain from range 30 times

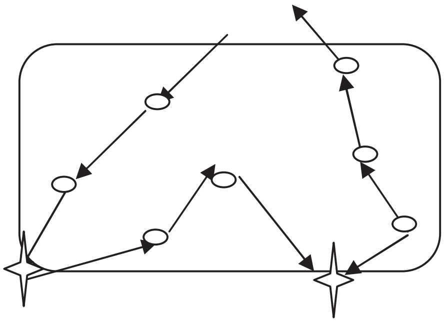

Fig. 7. Captured limit

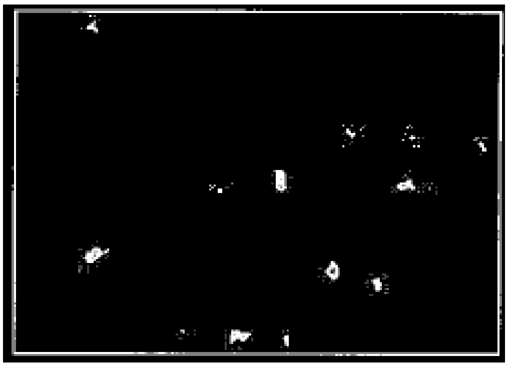

Fig. 8. Noise Removed

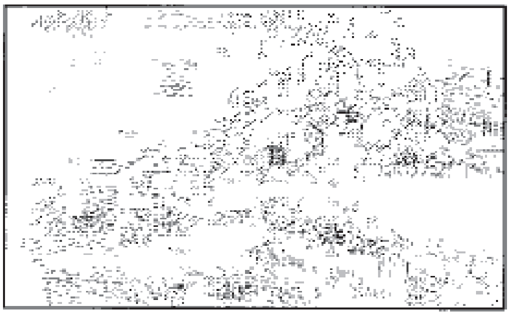

Fig. 9. Fig 6. to 80 times

Fig. 10. All the point of figure. 9 is followed

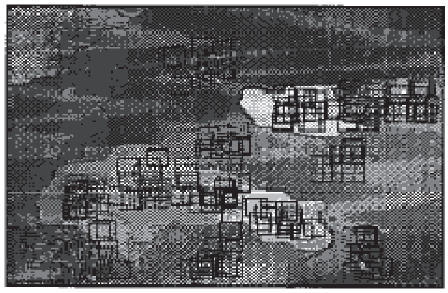

Fig. 11. Fig 10 Noise Removed

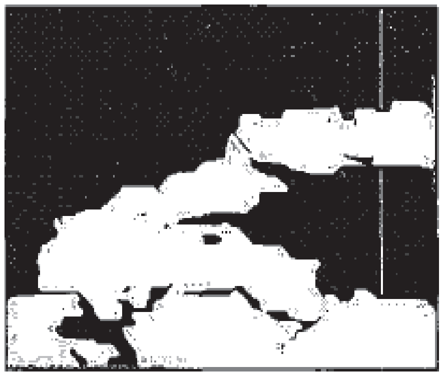

Fig. 12. Distribution of distance to DOMAIN

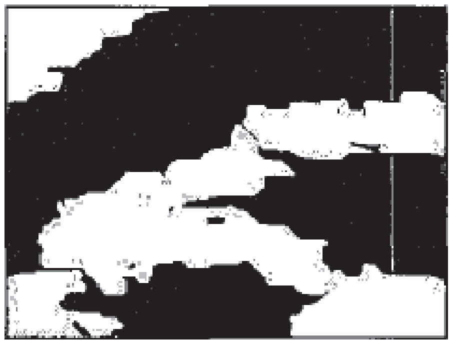

Fig. 13. Sum of the distance, and the no pixels

Fig. 14. Distribution of distance to domain

As already noted, all the initial points of departure from Fig. 4 are present in Fig. 9. These initial points allow a complex path during mapping from RANGE to DOMAIN, so many of the initial points overlap, and concentrate on the same point. Label nos. are allocated to all of these initial points. Next, if the path is followed backward from Fig. 9 to Fig. 4, the initial points gradually return to the RANGE region, and finally all pixels are filled in at the initial points. At this time, the initial points have labeling data, and this enables region segmentation of the image. The situation after following the path backwards from Fig. 9 to Fig. 4 is shown in Fig. 10. As you can see, there is region segmentation between the smoke region and other regions.

3. SMOKE REGION ANALYSIS

For Analysis the region result we are using the region segmentation with the help of fractal in this paper we are using Smoke judgment is done using the 4x4 RANGE around the center of gravity of each region, and the DOMAIN corresponding to each range . The judgment characteristics are taken to be:

1. Size of distance variance from each center of gravity to each DOMAIN region.
2. Smallness of the ratio of the total sum of distances from each center of gravity to each DOMAIN region vs. the total Number of pixels in each region.
3. Template matching using a previously set smoke region template.

The distance variance in (1) is included because the DOMAIN range vanes and its variance value increases when smoke is present in a region. The ratio of the total sum of distances vs. the total sum of pixels in (2) is included because the total sum of the distance between the DOMAIN and center of gravity point per unit area decreases when smoke is present. (3) is a type of post-processing to improve precision.

4. EXPERIMENTAL DETECTION OF SMOKE PORTION

The results of judging each region in Fig. 11 using each of the smoke judgment characteristics described in the previous Section are' shown in Figs. 12-14. The judgment result images are shown in binary. The regions shown in white are those judged to the smoke regions. In Fig. 12, where judgment was done only using judgment technique (I), the smoke area was detected, but the region of trees in the original image was also recognized. We can say this happened because trees, which are groups of leaves, have fractal properties, and technique (1) cannot distinguish them from smoke regions. In Fig. 13, where judgment was done only using judgment technique (2), the smoke region was detected. In addition, the region of trees misrecognized with technique (1) was also misrecognized. However, the number of cases where regions of trees were selected was smaller than in judgment with (1). In Fig. 14, where judgment was done by taking the logical product of judgment techniques (I), (2) and (3), the smoke regions, and only the smoke regions, were correctly detected.

5. CONCLUSIONS

Fire smoke detections are crucial for forest resource protections and public security in surveillance systems. The new Method of decorative pattern design of the cloud model and fractal art is illustrated by the above words we take use both of the cloud model and fractal art and fuse both theories, and find the details extraction techniques got smoke region. Smoke has a vague boundary line, and it difficult to detect with processing using boundary line information (like edge detection and threshold processing). We propose extraction of smoke regions using region segmentation based on fractal encoding. This technique does not extract intonation on the smoke's shape or form itself. Rather, it exploits the fact that the shape of the smoke has the property of self-similarity this technique uses only a single brightness image to extract smoke regions using the positional relationships of pixels. Issues for future study include: reducing processing time, and adapting the system to various other situations, similar to fires, which occur at a remote distance. The experimental results show that fire smoke can be successfully detected on the method proposed in the paper. We will also take attempt to find a faster concept promoting this approach.

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