## Analysis of Bone Images to Recognize Animals Using Geometric Shape Properties

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**Abstract:**

An approach is presented for animal bone image analysis using geometric shape properties. The proposed approach, which is based on image processing techniques, has applications in medicine and veterinary anatomy studies, orthopedics, paleontology, and archaeology. Several image features, including geometric and moment invariants (regular and Zernike), are derived for recognition. The first-level classification is used to distinguish different kinds of bone and the second-level to recognize the right animal the bone is belong to. Two-dimensional structures, namely cluster-property and cluster-features matrices, have been employed to evaluate different bone's characteristics. Experimental results at the first-level recognition exhibit better performance of the geometric features compared to moment invariants and Zernike moments. On the other hand, Zernike moments showed supremacy in differential diagnosis at the second level to recognize animals.

## High Speed, Low Power Fractal Image Coder Based on Binary Matching

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**Abstract:**

In this paper a new method for fast and low power fractal coding is presented. The method introduced is based on the classification of domain and range blocks according to their subsampled binary representation. The technique although greatly reduces power consumption and increases processing speed but has little effect on the degradation of the output result compared to the available fractal techniques. In order to show the functionality of the proposed algorithm, the architecture was implemented on a FPGA chip. It was further shown that the power consumption is reduced by the proposed architecture. The resulted compression ratios, PSNR error, gate count, compression speed and power consumption are compared against the existing designs. Applications of the proposed design in certain fields such as mass volume database coding are also discussed.

## A Hybrid Method Based on Gas Diffusion Model and Fuzzy Cellular Automata for Image Sharpening

Fariba Mahdavifard and Mohammad Reza Meybodi
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**Abstract:**

Image sharpening is one of the most significant operations in image processing. In Gas Diffusion Model for image sharpening, the ambiguity of the image is modelled to the process of gas diffusion. In this method usually the value of parameter $\alpha$ is the same for all pixels in the image; therefore all parts of the image would be sharpened uniformly. If we consider a local value for parameter $\alpha$ for each pixel, the performance of method would be much better. This local value should be high in parts of the image with high frequency variations (edges) and should be low in other parts.

In this paper a novel method for image sharpening is presented which is a hybrid of image sharpening based on Gas Diffusion Model and Fuzzy Cellular Automata. In this method Fuzzy Cellular Automaton calculates appropriate local value for parameter $\alpha$ in each pixel using fuzzy rules. The result obtained from implementation shows that the performance of this method is much better compared to other sharpening methods .

## SH5: Signal & Speech Processing

## Speaker Overlap Recognition and Segmentation using Machine Learning Methods and Its Application in Speaker Indexing

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**Abstract:**

Simultaneous occurrence of speech from one or more than one speaker is considered as speech overlap. Speech overlap is due to distortion in