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# UNCERTAIN FINDING OF LEAF -DISEASES FROM LEAF IMAGES BY USING GENETIC ALGORITHM

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**Abstract:**

The considerable quantity of the manufacturing cost of a pair of leafs is invested in the unbiased leafs and so the efficient utilization of the resource is of prime importance. The image processing and genetic algorithm theories are applied in this system. The images of arbitrary shape Leaf and the base of the Plant were the input of the system. An identification In order to achieve high identification accuracy, all components of the scanned image need to be enhanced, i.e. palm print lines, textures and hand geometry features. In view of Histogram Equalization (HE), a difference upgrade plot named Adaptively Increasing Value Histogram Equalization (AIVHE) can be utilized as an improvement strategy. The output of the system is the placement of the bases of the Plant on the arbitrary shape Leaf. Consequently, this task involves incorporating as much prior information as possible (e.g., texture, shape, and spatial location of organs) into a single framework. In this paper, we present a hereditary calculation for computerizing the division of the prostate on two-dimensional cuts of pelvic processed tomography (CT) pictures. In this methodology the fragmenting bend is spoken to utilizing a level set capacity, which is developed utilizing a hereditary calculation (GA). Shape and textural priors got from physically fragmented pictures are utilized to compel the development of the portioning bend over progressive ages.

**Keywords:** *Genetic Algorithm (GA), Single Large Object Placement Problem (SLOPP), Peak Signal to Noise Ratio (PSNR),Root Mean Square (RMS).*

## I. INTRODUCTION

Nowadays, in every domain computerized systems are replacing the traditional human workforce. Among these technologies placement of different sizes of Planets on Leaf is also done by computerized system with the application of different computing algorithms. A hereditary calculation is a kind of looking through calculation. It looks an answer space for an ideal answer for an issue. The key quality of the hereditary calculation is the manner by which the looking is finished. Hereditary calculations (GAs) are search strategies dependent on standards of normal determination and hereditary qualities. By using Genetic Algorithms the decision variables of a chase issue are encode into restricted length arrangement of letter sets of certain cardinality. Chromosomes are the strings which are candidate solutions to the search problem, the alphabets are referred to as genes and the values of genes are called alleles.

GAs works with coding of parameters, rather than the parameters themselves. Selection, recombination, and mutation operators are basic operators in genetic algorithms. Selection methods can be divided into fitness proportionate selection and ordinal selection. Tournament selection and truncation selection are ordinal selection. After choice, people from the mating pool are recombined (or traversed) to make new, better, posterity. Examples of GA operators are shown in figure 1.

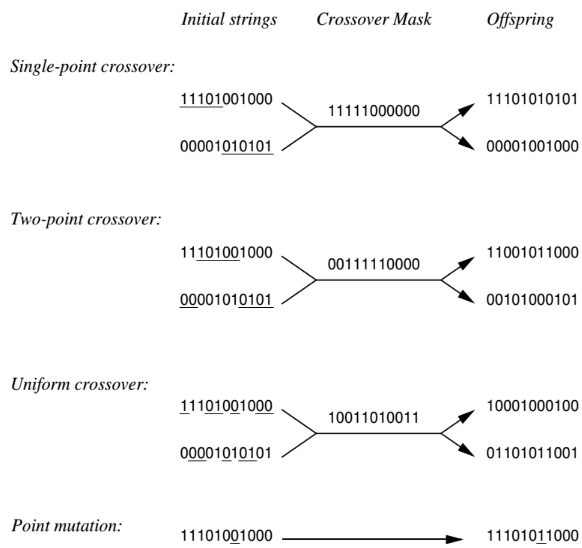


**Fig. 1 Example of Genetic Algorithm Operators**

In this paper, spatial coordinates of Planets are applied to GA as chromosomes. Random coordinates of images are produced and the parent chromosomes are selected by using fitness function. Two rules are used when selecting fitness function i.e. overlapping and over placing. Next generation is got by crossover of two parents.

## II. RELATED WORK

This section shows the related works that apply genetic algorithm for different kinds of applications. The project presented a new genetic algorithm for cell placement problem. The algorithm was based on a generalization of the two-dimensional bin packing problem. The hereditary encoding of a full scale cell position and the comparing hereditary administrators were depicted. The calculation had been tried on MCNC benchmarks, and the nature of the item arrangements was practically identical to the best distributed outcomes.

The limitation of this algorithm is that the current runtime was too extensive. The described two genetic algorithms for a rectangular packing problem. The two GAs were hybridized with a heuristic situation calculation, one of which was the notable Bottom-Left daily schedule. A second situation technique had been created which conquers a portion of the weaknesses of the Bottom-Left principle. The two cross breed hereditary calculations were contrasted and heuristic position calculations. So as to show the adequacy of the plan of the two hereditary calculations, their exhibition was contrasted with arbitrary hunt. Since the performance difference between the two hybrids GAs was only due to the improved heuristic, the decoder had a larger effect on the outcome of the hybrid technique than the GA.

Project proposed a system that used Genetic Algorithm for the two-dimensional Single Large Object Placement Problem (SLOPP) problem. The two-dimensional Single Large Object Placement Problem (SLOPP) issue comprised of deciding a cutting example of a lot of n little rectangular piece types (little item) on a rectangular stock plate (huge object) of length and width, as to expand the whole of the benefits of the pieces to be cut. Each piece is portrayed by a length, a width, a benefit (or weight) and an upper interest esteem. Just guillotine cuts are permitted and the pieces might be turned by 90°.

## III. EXISTING SYSTEM

Firstly, image acquisition is carried out for Leaf and Planet. The original input image to the system is colored jpeg image. Both Plant and Leaf images are color images. Then these color images are converted to gray images to remove RGB values and get gray image which contains only black and white with two binary values. After converting to gray image, binarization is done to remove unwanted gray values which are used only for knowing whether there is pixel value or not. After that boundary detection is used for selecting the boundary values of Planets. Filling is done with random method. Filling is used to know the area of the image. Finally genetic algorithm is used for Plant placement.

## IV. PROPOSED SYSTEM

Here the enhancement level of proposed method is compared with that of Histogram Equalization, BUBO, AIVHE method using two quality measurements, Absolute Mean Brightness Error (AMBE) and Entropy. Which is using in PSNR and RMS.

**PSNR:** PSNR is the most widely used image quality metrics. This ratio (in decibels) is often used as a quality measurement between the original and a compressed image. It is defined as the ratio between the maximum possible power of a signal and the power of corrupting noise that affects the fidelity of its representation. The higher the PSNR, the better the quality of the compressed or reconstructed image.

$$PSNR = 10\log_{10}\left(\frac{MAX^2}{MSE}\right) \quad \text{........................ 1}$$

PSNR is calculated using the following equation Where, MAX is the highest possible pixel value of the image.

RMS noise and SNR

The **RMS Noise** is defined as the square root of the mean of variances from the background region.

$$\text{RMS noise} = \sqrt{\frac{\sum_{i=1}^{n}(X_i - \frac{\sum_{i=1}^{n} X_i}{n})^2}{n}} \quad \ldots\ldots\ldots\ldots\ldots\ldots 2$$

*Where n = number of lines in background or signal region*

(1) AMBE

AMBE is the difference between the Global Mean of input image to the Global Mean of the output image.

$$\text{AMBE} = \text{abs}((\text{Mean of input image}) - (\text{Mean of output image}));$$

(2) Entropy

It is defined as a measure of the average information content of an Image an. It is calculated using the formula

$$E = -\sum P(x_i) * \log_2 P(x_i) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

Where $P(x_i)$ is the probability of the i th gray level.

The input palms are acquired by using Nokia 2700 with resolution of 1200 1700. Experiments are done with image of size 256 × 256 .The simulation is done in Matlab R2008a with 100 test images. [2] proposed a method in which the minimization is per-formed in a sequential manner by the fusion move algorithm that uses the QPBO min-cut algorithm. Multi-shape GCs are proven to be more beneficial than single-shape GCs. Hence, the segmentation methods are validated by calculating statistical measures. The false positive (FP) is reduced and sensitivity and specificity improved by multiple MTANN.

The observations show that the proposed algorithm enhances the contrast of the image and also preserve the brightness. The original image and output from different enhancement methods are given in Figure and how the contrast of the image is enhanced. From Fig.1 and Fig.3, it is clear that the brightness of the quality image is well preserved.

The comparison of entropy of the proposed method with other methods. The entropy of the EOPE method is higher than that of all other methods. Hence, this method gives enhancement of image with more information.

Figure shows the comparison chart of entropy value and AMBE of different methods. From the technique has the higher entropy value. By observing the results of final stage, the EOPE technique has lowest AMBE value. So this method has more information and preserves more brightness than BUBO, HE and AIVHE method.

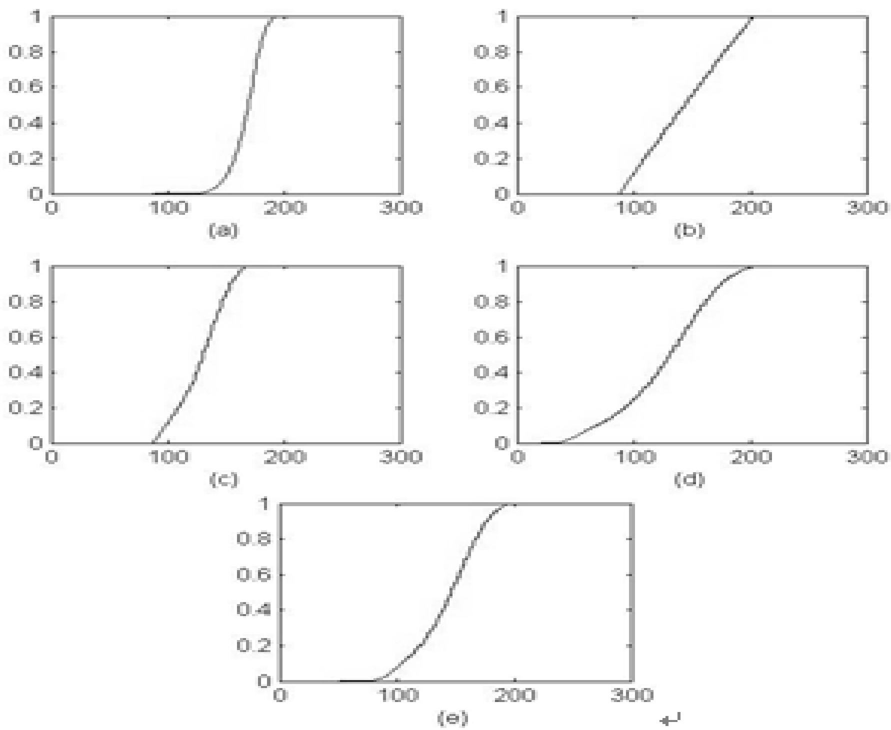


**Figure 4.1 CDF of figure 1. (a) original image (b) enhanced by HE (c) enhanced by BUBO (d) enhanced by AIVHE γ=0.35,β=0.35 (e) enhanced by EOPE**

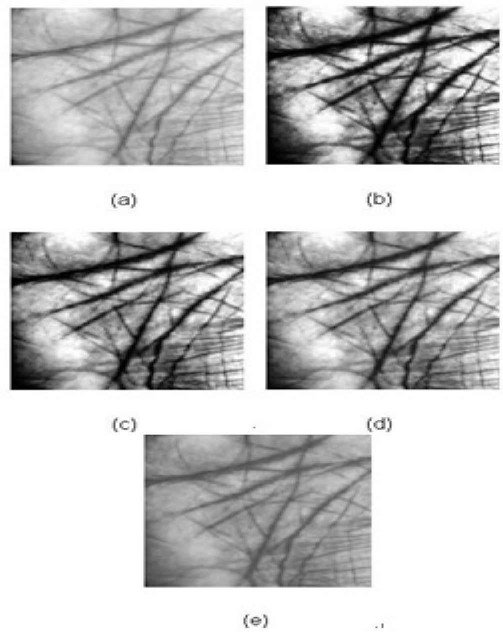


**Figure 4.2 (a) original image (b) enhanced by HE (c) enhanced by BUBO (d) enhanced by AIVHE γ=0.35,β=0.35 (e) enhanced by EOPE**

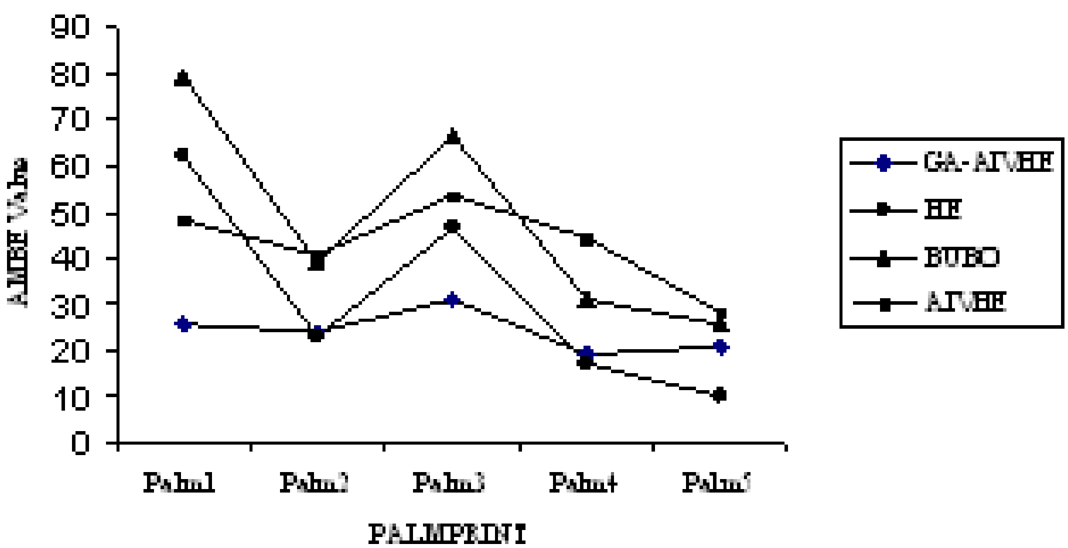


**Figure 4.3 Enhancement Methods Vs AMBE**

***Rewards***

- The EOPE method for image contrast enhancement enhances image quality.
- The method can enhance image contrast effectively by improving the information and preserving the brightness.

## V. MATERIALS AND METHODS

Different methods of image processing are used in this system. These methods are Color to Gray Conversion, Global thresholding Method, Inner Border Detection and Genetic Algorithm.

### *A. Color to Gray Conversion*

The most trivial way to convert a color image to grayscale is to retain and use the luminance component of the color image. An alternative is to compute the colors in the graphic and to assign different levels of gray to all neighboring colors. For converting the RGB image to gray image the transform equation is used:

$$Gray = (0.299*Red+0.5876*Green+0.114*Blue) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ 4$$

For example, for an RGB image with the pixel values RGB of 253, 220 and 185 respectively, can be converted into gray image of pixel value of 226 by using this equation. This is shown in figure 4.3.

### *B. Global Thresholding Method*

Thresholding is used to obtain the binary value of image. Global thresholding method is used to determine threshold T from the whole image f by the function T(f). In this system, global thresholding is used for binarization after conversion of color to gray image. Thresholding can reduce the storage space as well as provide high processing speed. Binary image g can be got as follows:

$$g(i,j) = 1 \text{ for } f(i,j) >= T$$

$$g(i,j) = 0 \text{ for } f(i,j) < T$$

Where T is the thresholding, $g(i,j)=1$ for image elements of objects, and $g(i,j)=0$ for image elements of background. In global thresholding, a single threshold for all the image pixels is used. A global threshold is determined from the whole image f:

$$T = T(f)$$

In this system, the threshold point is set to 250 depending on the gray Leaf. The values lower than these thresholds are not suitable for achieving the good image.

### *C. Inner and Outer Border Detection*

The Plant is needed to place onto the Leaf. And placement can be done only when the boundary of Plant and Leaf is exactly known. Therefore, boundary detection is very important in placement. Boundary detection is also called edge detection because edges typically occur on the boundary between two different regions in an image. It can be used to produce line drawing of a scene from an image of that scene. Boundary detection can be divided into two methods: Inner boundary detection and Outer boundary detection. Inner boundary detection may need to trace outermost pixels of foreground. Outer boundary detection may need to trace innermost pixels of background. Among these two methods the proposed system uses inner boundary detection. [4] proposed a system in which the cross-diamond search algorithm employs two diamond search patterns (a large and small) and a halfway-stop technique. It finds small motion vectors with fewer search points than the DS algorithm while maintaining similar or even better search quality. The efficient Three Step Search (E3SS) algorithm requires less computation and performs better in terms of PSNR.

### *D. Genetic Algorithm*

A genetic algorithm is a type of searching algorithm. It searches a solution space for an optimal solution to a problem.

*The major phases of Genetic Algorithms are*:

- Create an initial population of chromosomes
- Evaluate each of the chromosomes in the initial population
- Select chromosomes that will have their information passed onto the next generation
- Crossover the selected chromosomes to produce new offspring chromosomes
- Mutate the genes of the offspring chromosomes
- Repeat step three through five until a new population of chromosomes has been created
- Evaluate each of the chromosomes in the new population
- Repeat step three through seven until some termination condition has been meet

Operators used in Genetic Algorithm are selection, crossover and mutation. The selection process is analogous to the survival of the fittest in the natural world. Individuals are selected for crossover based upon their fitness values the fitter the individual; the more likely that individual will be able to reproduce. Crossover is the main genetic operator. It operates on two parent individuals and generates an offspring. The crossover combines schemata from both parents, and therefore the offspring inherits some of the characteristics of the parents. [6] proposed a system in which an automatic anatomy segmentation method is proposed which effectively combines the Active Appearance Model, Live Wire and Graph Cut (ALG) ideas to exploit their complementary strengths. It consists of three main parts: model building, initialization, and delineation.

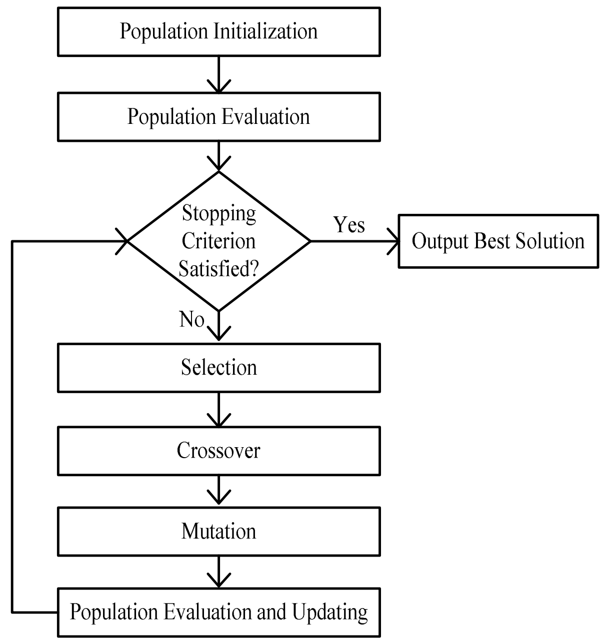


**Figure 5.1 Flowchart of Genetic Algorithm**

The first input to the GA is in the form of bit string and these bit strings are initial population for the genetic algorithm. Then, these initial populations are evaluated for selection till the best individuals are obtained.

## VI. CONCLUSION

The proposed system can be used for the placement of Plant on the arbitrary shape Leaf. The use of thresholding reduces the storage space, gets high speed and removes unnecessary detail from an image to concentrate on essential. In this system, placement is done with the use of GA based computerized system. . GA can quickly scan a vast solution set and solve problems with multiple solutions so very useful. GA is a technique which is straightforward and it for all intents and purposes doesn't request the information on arithmetic. The inductive nature of the GA means that it does not have to know any rules of the problem - it works by its own internal rules. So, human work cost can be diminished viably. For future works, GA can be utilized by combining with other decision making techniques such as neural network, fuzzy logic and hidden Markov model.

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