Seed Detection In Agriculture Using Ant Colony Optimization Techniques

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Abstract- *India is an advanced country and nearby 70% of the community relies on agriculture. Farmers have a large area of diversity for choosing various suitable seeds and predetermining the growth of the crop. The sensible diagnosis of seeds growth is vital as it is challenging. In the beginning days, the checking and examination of seeds growth were done manually by the expert person in that field. This needs an enormous amount of work also requires extreme processing time. Though mortal perception and cognition are especially powerful in recognizing and assuming patterns, the visual evaluation of seed growth. These methods were done in laboratories. But it is an extremely time-consuming method. To tackle this, digital processing techniques can be applied to identify seeds growth. The efficiency in the identification and classification of seeds growth is very vital for the rich farming of crop and this can be achieved using image processing. The main purposes of this research work include handling defect detection in seeds, improving by optimization techniques. The study has achieved desired outcomes which weakens the existing methods appropriately.*

I. INTRODUCTION

Seeds are the basis of agriculture. Technology has improved much of farming's day-to-day operations, but without a steady supply of high-quality seed, yields, and crop quality would be greatly diminished.

Seed quality plays an important role in the creation of agronomic and horticultural crops. Features such as trueness to type, germination percentage, purity, strength, and features are important to farmers planting crops and to homeowners establishing lawns and gardens. Producing and sustaining high seed quality is the goal of every professional seed producer.

A. Digital image processing

The digital image has a fixed set of parts, named as picture elements or pixels, described by the mathematical function f (a, b), where a and b are the vertical and horizontal parameters. Image processing is a method for controlling an image . It involves a huge number of methods that are present in numerous applications. These techniques can enhance or distort an image, highlight particular features of a picture, produce a new image from sections of other images, restore an image that has been degraded throughout or after the image acquiring the stage, and so on (Crane 1997).

B. Steps in digital image processing

The purposes of image processing, image acquisition is the initial step. Several electromagnetic and few ultrasonic sensing devices are commonly arranged in the structure of a 2-D array (Gonzales et al 2005). The easiest and common engaging topic of digital image processing is image enhancement. The purpose is to process the image such that the result is highly convenient than the original picture for distinct usage. Image restoration aims to rejuvenate or regain a picture that has been ruined by applying former knowledge of deterioration incidents (Jain 1989). Image analysis techniques need the extraction of certain features that assists in the identification of the entity. Segmentation segregation the image into its parts or objects. Representation & description almost seek the output of a segmentation level, which is normally raw pixel data, comprising the boundary of the region. The description is also named as feature selection. It works upon extortion of the attributes that come up in some quantitative detail. Recognition is a procedure that assigns a label to an entity, based on its descriptors.

C. Digital Image Processing in seed detection:

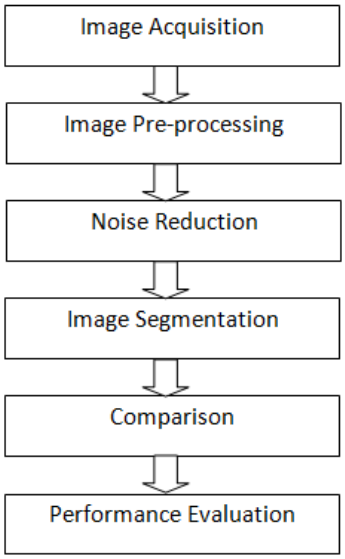
Agriculture is an important source of profit for Indian people. Farmers can produce a variety of crops but conditions limit the growth of crops. One of the foremost circumstances responsible for growth obliteration is of quality less seeds. Several crops suffer from quality less seeds. Some of the applications are Global Positioning System, Weed recognition, Plant Species Identification, Precision Agriculture, Grading of seed quality, sorting of seeds and quality Identification. The basic objective of this research is to detect the quality of seeds filtering methods and to identify the quality less seeds using segmentation technique.

II. LITERATURE REVIEW

Review on Denoising Techniques in PlantsGupta et al 2013 propounded in their research work, Denoising of images applying several thresholding methods namely Sure Shrink, Visu Shrink and Bayes Shrink (Rekha&Shailja 2016).The shown the results of various approaches of wavelet oriented image denoising techniques and expanded the existing technique and presented a Review comprehensive assessment of the proposed method (Shokhan 2014). Boyat& Joshi (2013) explored a novel image Denoising algorithm related to a joint effect of wavelet transformation and median filter. The method eliminates the noise from the picture and enhances the quality (Phakade et al 2017). The stage of wavelet decomposition is restricted to three. The familiar index Peak Signal to Noise Ratio and Root Mean Square Error reveal the marked improvement of image denoising higher than other techniques. Liwen Dong (2013) presented a method by presuming that the deviations of the noise and the actual wavelet coefficients of the picture are not forever identical across the scales. The presented technique involves not only the correlation of intra scale wavelet coefficients also involves the assumptions .The proposed denoise threshold method can adaptively change itself on the base of its position and decomposing scale and confirmed its effectiveness through replications with images grinned by additive white Gaussian noise and evaluate it with the classical threshold technique.

III. METHODOLOGY

Ant Colony Optimization (ACO) is serving on the incentive observed from the normal behavioural collections .ACO is a heuristic approach that has been proved as a successful method and used to several combinatorial optimization issues. The ants deposit pheromone on the land for searching at every pixel position of the image, based on the movements of several ants that are dispatched to pass on the image. Also, the movements of these ants are determined by the local difference of the image's intensity factors. The results are produced to express the better performance of the proposed method on the cluster analysis depending on the ant colony algorithm, data can be shown as different attributive ants and the cluster center can be surveyed as ants' feeding foundation. The Ant Colony Optimization method has emerged as a relatively new metaheuristic for hard combinatorial optimization issues. It is extended to assume the capability of ant colonies to resolve the shortest paths to food. By this approach.



IV. CONCLUSION

The most widely used method for seed disease detection is merely naked eye observation by a professional through which classification and identification of seed diseases are done. seed disease recognition by the visual method is more difficult activity and at the same times fewer reliable and can be performed only in limited locations. To identify the processing of the image is essential.A master method of removing noise from the images, before the employment of image processing them for further study is a great confront for researchers. The noise can mortify the image at the time when it's been captured or during transmission of the image. Before using image processing tools to an image, noise elimination from the image is performed at the most leading priority. The type of noise removal algorithms to eradicate from the noise relies on the types of noise present in the image. In this thesis, an efficient method is ant colony optimization is able to recognize the specific portions of the image which are affected by deficiencies. The future research will be persistent upon the construction of other filtering methods to overcome various other types of noises. Research can be extended to other optimization algorithms so as to give better results. The work can be applied to other types of images rather than seed images.

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