

Cancer Curing Medical Leaves using Texture Image Characteristics



A. Hema Deepika, N. M. Elango

Abstract: *The present day frame work of medical science of India and abroad clearly signals a drift inducing a general direction and turdency towards ayurvedic the medicines and formulations over other conventional medical streams. As a result elaborate and heightened efforts are undertaken to revamp the long forgotten herbal formulations over practiced by the great ayurvedic acharyas of this sub continent which acclaimed trustworthiness, effectiveness, and a sure cure for various diseases when the conventional medicines failed to make a headway. The side effects produced by conventional medicines were found to be in excess, where as the herbal formulations were found to have no significant side effects, As such the modern scientists, physicians, and even herbalists are streamlining their effort to formulate herbal medicines and drugs to cure various dreaded diseases like cancer. This research work proposes an innovative and novel process of analyzing cancer curing medical leaves that are available in India .The statistical texture analysis of the leaf is formulated by correlation, homogeneity, contrast, entropy, and smoothness and the result of such analysis is shown.*

Keywords: *Texture Analysis, Correlation, Homogeneity, Smoothness, Contrast, Entropy, Cancer Curing Species.*

I. INTRODUCTION

The ecosystem is the biological community of interacting organism and their physical environment. For this system, the plant is the fundamental to all and without it there's no life .Here the research is oriented on particular group of plants and their leaves which is unexplored so far for the utilities specified here under. But this is not a common practice in the traditional medical field, but using high quality digital camera images of the herbal leaves were obtained and the texture based algorithm justified the existence of unique texture patterns in leaves. Plants are the key factor for the survival of life on earth. As plants are fundamental for regular security, it is increasingly indispensable to recognize and describe them decisively. Assorting of plants has a wide use approaching in agriculture and prescription, and is especially basic to the science grouped characteristics investigate. Leaf picture Classification technique is the most favored decision when contrasted with strategies like Cell science or Molecule Biology techniques for leaf plant classification.

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In the earlier decade thinks about have been led on computerization. Plants are recognized and made less perplexing by means of computerization of PC. A plant ID should be established on a plant portrayal framework in light of the fact that there are more than one-half million of plants on the Earth and affirmation without gathering is a stunning endeavor. Leaf recognizable proof structures a fundamental part in plant characterization. Plants can be consistently assembled dependent on various parts of plants. Anyway there are three dimensional articles that extend complexity. Thus with the end goal of plant characterization, perceiving its separate leaf picture is a straightforward and less demanding way. Each leaf picture is characterized through various related procedures. At first an information base is made utilizing test pictures of a wide range of leaves. Each leaf picture is connected to the relating plant subtleties. At the point when the leaf picture is transferred to PC and afterward its fundamental highlights are distinguished and recorded utilizing picture handling strategies. Highlight extraction is a basic stage in light of the fact that the capacity of a framework to segregate different sorts of leaves relies upon the highlights extricated. The highlights must be steady so as to make the distinguishing proof framework hearty. Along these lines the plant leaf is perceived utilizing systems of machine learning.

This paper is gathered into four segments as referenced underneath: Section I speaks about the introduction of the work. Section II about the literature survey Section III about the proposed model to extract the features of leaf images Section IV describes the experimental results for different cancer curing leaf images Section V gives the conclusion of the work

II. LITERATURE SURVEY

I.Kiruba Rajia and KK.Thyagarhan describes that they have examined a diverse technique for segmenting leaf to identify color, shape, and texture [1]. Pushpa BR has used different morphologic features such as mean, standard deviation, convex hull ratio; isoperimetric quotient, eccentricity and entropy are drawn out for the leaf [4].

Sethulekshmi proposed a comparative study of global and local features descriptors and classifiers used in leaf recognition [5]. JyotismitaChaki shows Gabor filter is used to cast the texture of leaf, even GLCM is also used by using curvelet transform co-efficient the format of the leaf is identified. The neuro-fuzzy controller, and feed-back propagation and multilayered perceptions are used to find efficiency [6]. This work gives the idea of using different texture feature methods [11].

III. PROPOSED WORK

Texture analysis is a foundation for object recognition and classification in numerous fields. The texture is one of the methods to divide image into regions according to our needs. The analysis of texture features is crucial for certain image processing application.

Harlick in 1973 proposed this method and it is one of the acclaimed methodologies in texture analysis. The main idea of this method is generating features based on GLCM[10].

M is the number of gray levels used

A is the probability distribution in the GLCM

μ is the mean value of A

μ_x, μ_y, σ_x and σ_y are the mean and standard deviation of A_x and A_y

The Texture Features used are ([9][10])

A. Correlation: “It is an amount of measuring how correlated a neighbor pixel and a pixel over the entire image.”

$$C = \frac{\sum_{i=0}^{m-1} \sum_{j=0}^{m-1} \{ij\} A(i,j) - \{\mu_x \mu_y\}}{\sigma_x \sigma_y} \quad (1)$$

B. Smoothness: “It is a measure of gray level contrast that can be used to establish descriptors”

$$\text{Smoothness} = \sigma^2(A) / [1 + \sigma^2(A)] \quad (2)$$

C. Homogeneity: “It returns a value that measures the closeness of distribution of elements in the GLCM to the GLCM diagonal.”

$$\text{Homogeneity} = \sum_{i,j} \frac{A(i,j)}{1+|i-j|} \quad (3)$$

D. Contrast: “Amount of measuring the magnitude of the contrast between the neighbor pixel and its pixel over the entire image.”

$$\text{Contrast} = \sum_{i,j} |i-j|^2 A(i,j) \quad (4)$$

E. Entropy: “It is a numerical measure of changeability that can be done to represent the change in the texture of the input image.”

$$\text{Entropy} = -\sum (A * \log_2(p)) \quad (5)$$

IV. EXPERIMENTAL RESULT AND DISCUSSION

The goal of the work is to analyze the cancer curing leaves that are present in India. Initially, the leaf is snatched from the sensor. Later the pre-processing of the image is done. The image is resized to form a square matrix. Further, the image is transformed to grayscale in order to calculate GLCM. Next, the GLCM values are set in-between zero and one to calculate texture metrics

Table - I: Present study of Few Cancer Curing Leaves

Sino	Plant species	Common name	Family	Active constituent	cell-lines used
1	Allamanda cathartica	Golden Trumpant	Apocynaceae	Allamandin	P-388 leukemia
2	Catharantus Roseus	Periwinkle	Apocynaceae	Vinblastine, Vincristine	Anti-Cancer
3	Cyclea peltata	Rajpatha	Menispermaceae	Tetrandrine	Breast-Cancer
4	Heliotropium indicum	Indian Heliotrope	Boraginaceae	Indicine-N-oxide	Anti-Cancer
5	Ipomoea Batatas	Sweet Potato	Convovulaceae	4-Ipomeanol	Anti-Cancer
6	Montezuma speciossima	Ban Kapas	Malvaceae	Gossypol	P-388 plasmodesma , Breast cancer

Table - II: Texture Analysis Results for Cancer Curing Leaves

Sl no	Plant species	Correlation	Homogeneity	Smoothness	Contrast	Entropy
1	Allamanda cathartica	0.9967	0.987	0.0596	0.0228	3.5015
2	Catharantus Roseus	0.9879	0.9787	0.0541	0.0437	5.5595
3	Cyclea peltata	0.9923	0.9720	0.0524	0.0434	4.9509
4	Heliotropium indicum	0.9886	0.9758	0.0535	0.0641	4.0145
5	Ipomoea Batatas	0.9878	0.9710	0.0547	0.0712	4.3339
6	Montezuma speciossima	0.9865	0.9682	0.0499	0.0711	4.7114



Table - III: Correlation between Contrast and Other Fields

SI No	Fields	Correlation
1	Correlation	Inversely correlated
2	Energy	Inversely correlated
3	Homogeneity	Inversely correlated
4	Entropy	Directly correlated
5	GLCM	Inversely correlated
6	Variance	Inversely correlated
7	Standard deviation	Inversely correlated
8	Uniformity	Inversely correlated
9	Smoothness	Directly correlated
10	Sum Average	Inversely correlated

Result by using graph

In fig1 Y-axis represents texture metrics and X-axis the names of different plants. Where 1.Allamanda cathartica 2. Catharantus Roseus 3. Cyclea 4 .Heliotropium Indicum 5. Ipomoea Batas 6. Montezuma speciossima.

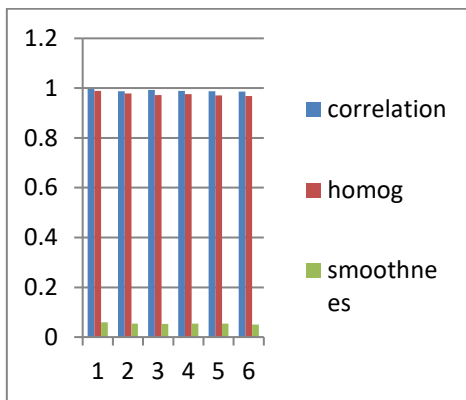


Fig 1: Texture characteristics of cancer curing medical leaves

V. CONCLUSION

This paper analysis few herbal medicinal leaves that is used to cure cancer in India. Analysis of the leaf is done by using texture metrics and gray level co-occurrence matrix. A Statistical approach is used in this paper. Table 1 provides the detail of different leaves. From table 2 and figure 1, it is clear that the Texture metrics correlation, homogeneity, smoothness, contrast, entropy is found to be identical. Table 3 shows the relationship between contrast and other attributes of texture metrics. The dataset generated in the table 2 can be used as a reference and training dataset to identify the similar characteristics of unknown herbal leaves for further research.

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is Image Processing, Big Data and Deep Neural Network

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