A STUDY OF EARLY DETECTION OF SKIN CANCER USING NEURAL NETWORK

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Abstract: Skin disease is the most pervasive tumor in the light cleaned and it is by and large caused by introduction to the bright light. Skin layer is separated into Epidermis (external layer), Dermis (center layer) and Hypodermis (most profound layer). The epidermis has keratinocytes and melanocytes cells, these are in charge of our skin pigmentation which gives common assurance against sun beams. The majority of the skin malignancy is reparable at starting stages and the early discovery of skin disease has the potential to decrease mortality and bleakness. Programmed early malignancy discovery recognizes the harmful development from other skin ailments. There are sure one of a kind highlights for skin malignancy locales such features are separated utilizing curvelet transform technique. The Dermoscopic picture of skin growth is subjected to preprocessing and post processing for noise removal and image enhancement. In our proposed method on digital image processing and modified Kohonen network by neural grouping for arrangement reason, in addition this technique jumping to accomplish a controlled exactness level of grouping homogeneous segments of skin pictures. This paper displays an overview of early recognition of skin growth utilizing diverse propelled innovation, for example, an Artificial Neural Network, Fuzzy system and genetic Algorithm. In the survey many algorithms have been put forward in the scientific review.

Index terms- Modified Kohenon Network,Curvelet Transform,Segmentation ,Feature Extraction,Noise Removal.

I. INTRODUCTION

Skin growth is the deadliest type of disease in the event that it isn't recognized in beginning time. Skin growth may show up as benevolent melanoma and harmful melanoma. Favorable melanoma is appearance of mole on skin . Harmful melanoma is deadliest type of tumor in this manner it needs prompt identification. Dangerous melanoma emerges from malignant development in pigmented skin lesion.Melanocytes are the shades offering shading to skin which for the most part begins with a little district later spreads to the next skin zones through lymphatic framework or blood. In typical case old cell supplant by new cell while if there should arise an occurrence of disease they develop in irregular way it end up plainly malignant because of hereditary issue by outer or inward factor. Human skin is made of three layers - dermis, epidermis and hypodermis. Dermatology is the limb of restorative science that is worried about analysis and treatment of skin based turmoil. Beginning period identification of skin growth needs PC helped location. By and large, specialists utilize biopsy technique for the conclusion of skin growth. Biopsy is the expulsion or rejecting off the skin and those skin tests are experienced. There are many strides for conclusion of skin disease, for example, preprocessing, segmentation,feature extraction classifier for determination.

Fig (1) Abnormal Image.

Fig (2) Normal Image.

II. LITERATURE SURVEY

The survey many algorithms have been put forward in the scientific review.Palak metha et al.[1] proposed an algorithm for Adaptive fuzzy system for computer aided skin cancer diagnosis .They have taken different Dermoscopic cancer images and they are Used Various preprocessing technique, segmentation and classification. They applied median filter for noise removal. Finally they given conclusion is that adaptive fuzzy inference neural network gives more accuracy than BPN network.

In the framework different calculations have been advanced in the intelligible diagram. Azin Ahmed et al. [2] Proposed a Modified Kohenon self-sorting out Map (KSOM) Clustering for Categorical Data can be used to perform bunching for complex data. They creators utilized Modified Kohonen self-organizing map.

Khaled and AI-Jumaily et al. [3] proposed a wavelet and curvelet based neural structure can be used to perform skin advancement Confirmation sensibly Authors separated and a quantifiable neural system with multilayer perceptron. Curvelet based methodology is possessed with this framework. Precision is said at the rate of 86.8.

Abdul Jaleel et al.[4], has built up a modernized skin improvement finding by hardening electronic picture dealing with and back propagation neural network , which was conveyed as a smart classifier model to decrease the conclusion time and assembling the destructive and compassionate. It winds up being an unrivaled confirmation method then the standard biopsy framework. The novel parts of the appointed picture were cleared by utilizing GLGM technique. Precision was spoken to as 82%.

Muhammad Ali Farooq et al. [5] made Automatic Lesion Detection structure (ALDS) for skin ailment Portrayal. They have focused towards the difference in Automatic sore recognizable proof system diagram work in light of Probabilistic approach. They moved nearer to change datasets and relative examination. They have used watershed and support Vector machine for
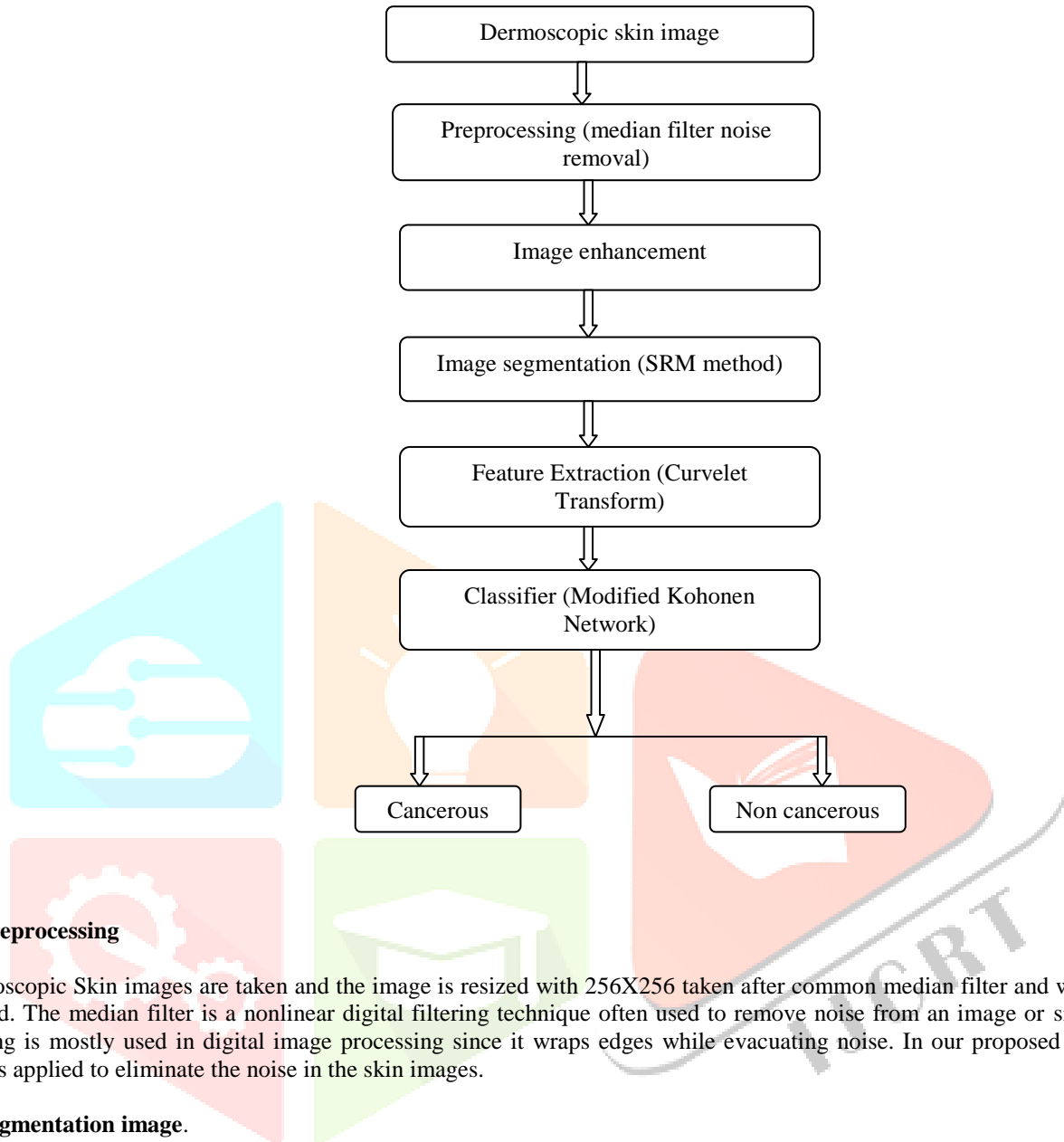 their work.

Mahmoud Elagamal, et al [6] has discussed for automatic skin cancer images classification. These paper boons two hybrid techniques for the classification of the skin images. The author has applied hybrid systems.

Suhail M.Odeh, et al, [7] proposed an Adaptive Neuro-fuzzy Inference system (ANFIS) Algorithm for Automatic Diagnosis of Skin Cancer. They had introduced a two core parts Feature selection using Greedy Feature Algorithm (G-flip) and Classification method using ANFIS algorithm.

 Pravallika Raj,et al[8] social affair of Non-melanoma bruises using wavelet and Curvelet based surface Analysis .proposed work contains Wavelet based surface examination system for strategy of non-melanoma skin sore skin damage gathering. Multi-level Discrete wavelet change executed for separate the photo. GLGM based component Extraction realized. Probabilistic Neural Network completed for characterization.

III PROPOSED WORK

        There were diverse issue in the past research on melanoma recognition from Dermoscopic pictures .as a rule skin growth is the destructive sort of disease and the vast majority of the skin malignancies are reparable at introductory stages if identify. In this direction the method can be proposed here digital image processing technique and self-organization (SOM) by neural clustering for classification purpose. There are certain unique features for skin cancer regions such features are extracted using feature extraction technique curvelet transform method. The Dermoscopic picture of skin malignancy is taken and is subjected to different preprocessing and post processing for noise removal and image enhancement.   Then the image can be segmented based on the region of Interest(ROI)Various empirical tests can also be performed and to find out the relationship between characteristics of data good classifier performance useful information can be extracted from images and pass to a classification system for training and testing. Significant focus is to diminish the quantity of ages and to increment promote order rates contrasted and traditional techniques. In our proposed technique bouncing to accomplish a managed exactness level of bunching homogeneous segments of skin pictures. Additionally fusing with curvelet change a smaller and definite grouping could be improved for more precision.

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           ┌─────────────────────────────┐
           │    Dermoscopic skin image   │
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           ┌─────────────────────────────┐
           │ Preprocessing (median filter│
           │       noise removal)        │
           └─────────────────────────────┘
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           ┌─────────────────────────────┐
           │      Image enhancement      │
           └─────────────────────────────┘
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           ┌─────────────────────────────┐
           │ Image segmentation (SRM     │
           │          method)            │
           └─────────────────────────────┘
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           ┌─────────────────────────────┐
           │ Feature Extraction (Curvelet│
           │         Transform)          │
           └─────────────────────────────┘
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           ┌─────────────────────────────┐
           │ Classifier (Modified Kohonen│
           │          Network)           │
           └─────────────────────────────┘
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  ┌──────────────┐              ┌──────────────┐
  │  Cancerous   │              │ Non cancerous│
  └──────────────┘              └──────────────┘
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3.1 Preprocessing

Dermoscopic Skin images are taken and the image is resized with 256X256 taken after common median filter and wiener filter is applied. The median filter is a nonlinear digital filtering technique often used to remove noise from an image or signal. Median filtering is mostly used in digital image processing since it wraps edges while evacuating noise. In our proposed work median filter is applied to eliminate the noise in the skin images.

3.2 Segmentation image.

Segmentation is the method for apportioning a computerized picture into different segments. The commitment to a thresholding operation is generally a grayscale or shading picture Exact identification of edge between skin injury and foundation skin is exceptionally basic since zone or width of skin sore is vital parameter therefore now and then it prompts misclassification of benevolent melanoma and dangerous melanoma. The target of segmentation is to enhance or possibly change the depiction of a image into something that is more basic and less asking for to take a gander at. In this work statistical region growing and merging technique is use is utilized. The figuring is utilized to assess the qualities inside a district explore and assembled in context of the joining criteria. The theory of locale joining begins at a seed bring up is emerged and from its four neighbor centers or pixel.

3.3 Feature Extraction

Curvelet Transform is made to beat the imprisonment of wavelet and Gabor Transform. Notwithstanding the way that, wavelets are by and large used as a piece of picture getting ready, in any case it fails to manage indiscriminately organized edges of the inquiry and the singularities of the challenge. Gabor filter vanquish the imprisonment of wavelet change and deal with the orchestrated edges, nonetheless it loses the spooky. In the wake of preprocessing highlight of skin pictures are extricated utilizing curvelet transform. These features are given to Neural Network Training.

3.4 CLASSIFIER

For SOM preparing Collected named include set is given with 16X16 size for each mark and grid number of line and segment is taken 15X15 ,No of preparing is taken 1000,learning rate 0.1 .at long last we get wanted weight and neuron names and spared as tangle files. After Training we get the Neuron name from matlab software.1 represent to Abnormal Condition or Malignant and 2 represent to Normal condition or amiable condition. For SOM Testing the SOM weight and neuron mark is the mind for facilitate new example given for Classification. Same procedure of preprocess, noise removal ,feature Extraction is improved the situation new given information tests took after by utilizing the weight and neuron mark we get nearest esteem or line and section of neuron name from that new image name.

IV CONCLUSION

The Kohonen self-arranging estimation has winning with respect to batching and complex issue in various regions, particularly when they incorporate high dimensional Data. Absolutely the changed Kohonen computation has upgraded the come to fruition by refining the data scatterings in the midst of the clustering procedure. As far as possible among packs can clearly be seen where data with practically identical features and in comparable orders or species are arranged in one zone or social occasions. They reduce the error rates certainly when appeared differently in relation to the more customary strategies. The challenge of request is to dole out an offered case to one of a set number of classes or characterizations. The results legitimize the way that the classifier execution depends upon the features that are associated. Along these lines the usage of feature selector overhauls the classifier execution.

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