ISSN: 2454-9940

INTERNATIONAL JOURNAL OF APPLIED SCIENCE ENGINEERING AND MANAGEMENT

E-Mail :
editor.ijasem@gmail.com
editor@ijasem.org

www.ijasem.org

INTERNATIONAL JOURNAL OF APPLIED SCIENCE ENGINEERING AND MANAGEMENT

ISSN2454-9940
www.ijsem.org
Vol 18, Issuse.1 March 2024

DETECTION OF VITAMIN DEFICIENCY USING IMAGE PROCESSING AND NEURAL NETWORK

Ms.P. Nava Bhanu[1] N. Varsha[2], K. Rupa Vyshnavi[3], V. Naga Veni[4]

#1M. Tech, (Ph.D)

#2,#3,#4 Students, Dept of Computer Science & Engineering,BWEC,

Bapatla,Andhra Pradesh,India

ABSTRACT_ Vitamin deficiency is a horrible disease characterised by uncontrolled growth and spread of aberrant cells that causes death all over the world. Skin tissue is a key organ that serves as a protective barrier against the environment. However, because it is positioned on the exterior surface, the Skin Tissue is susceptible to illness. Vitamin Deficiency is the most deadly type of vitamin deficiency in humans. Stage 1 Vitamin Deficiency can be totally treated if diagnosed early. Only a professional dermatologist may determine which is cancerous. Which one is not cancerous. Common symptoms of Stage 1 Vitamin Deficiency include the emergence of new moles or changes in existing ones. . One of the first steps in identifying Stage 1 Vitamin Deficiency is a physical examination with dermoscopy. These Stage 1 Vitamin deficiencies frequently have fuzzy borders, making visual detection impossible without a dermatoscope. The dermoscopy image of Vitamin Deficiency is captured and treated to various pre-processing and image filtering. Segmentation is used to distinguish the vitamin deficient zone from the healthy skin tissue. Medical photographs serve an important role in supporting health care providers in accurate diagnosis and treatment. Digital image processing techniques can better recognise features and provide illness status information.

1.INTRODUCTION

One of the most prevalent forms of vitamin deficiency worldwide, vitamin deficiency has a high mortality rate despite numerous technological and medical advancements. Out of all different sorts of lack of nutrient, adenocarcinoma is expanding at a disturbing rate. The explanation is basically ascribed to the expanded pace of smoking - both dynamic and latent. Aside from smoking, occurrence of adenocarcinoma is likewise revealed because of inward breath of unsafe vapor from indoor contamination, as well as different hereditary and different variables has been called attention to by Stop et al (2008).

Vitamin deficiency can be detected and diagnosed using a variety of techniques, including light microscopy, X-ray, CT, and MRI. Each of these enjoys its own benefits and hindrances. Out of different modalities

ISSN2454-9940
www.ijsem.org
Vol 18, Issuse.1 March 2024

utilized for prescreening, Sputum cytology pictures are the most ideal for prescreening on account of painless nature and cost adequacy. In this work, a minimal expense and viable pre-screening framework which can be conveyed on a wide scale was created. A few past investigations recommend that sputum cytology is ideal and reasonable strategy for lack of nutrient location has been brought up by Oswald et al (1971), Veena et al (2012), Pa1cic et el (2002) and (Thunnisen 2003). Sputum cytology is well-suited for distinguishing between various types of vitamin deficiency, according to Screiber & Mecrory (2003), who looked into various diagnostic methods for vitamin deficiency.

A concentrate on high-risk populace utilizing sputum cytology uncovered that a 5-year endurance pace of 54 % was seen in patients who gone through pre-screening rather than 13 % for the people who never had any pre-screening has been brought up by Unimportant and Thomas (2000). In the event that a framework is produced for pre-screening, equipped for identifying Nutrient Lack at beginning phases, then the endurance rate can be significantly expanded has been brought up by Hoda et al (1996).

The current day manual screening framework makes it challenging to execute such a framework because of absence of master cytopathologists and the huge volume of populace to be screened. Therefore, in today's world, an automated system that will pre-screen sputum cytology images for malignancy (vitamin deficiency) is a pressing requirement. Adenocarcinoma, a type of glandular epithelium-affecting vitamin deficiency (malignant cells), was the focus of this study. In the event that the pre-screening utilizing sputum cytology brings about certain case, further corroborative tests like biopsy should be possible for conclusion

2.LITERATURE SURVEY

2.1 SURVEY OF EXISTING WORKS

1.Author: **UzmaBanoAnsari1**

Title: Vitamin Deficiency Detection using Image Processing Description:

Vitamin Deficiency is the most common cause of death amongst humans. Vitamin Deficiency is abnormal growth of Skin Tissue cells most often develops on body exposed to the sunlight, but can occur anywhere on the body. Most of the Vitamin Deficiencys are curable at early stages. So an early and fast detection of Vitamin Deficiency can save the patient’s life. With the new technology, early detection of Vitamin Deficiency is possible at initial stage. Formal method for diagnosis Vitamin Deficiency detection is Biopsy method . It is done by removing Skin Tissue cells and that sample goes to various laboratory testing. It is painful and time consuming process. We have proposed Vitamin Deficiency detection system using CNN for early detection of Vitamin Deficiency disease. It is more advantageous to patients. The diagnosing methodology uses

ISSN2454-9940
www.ijsem.org
Vol 18, Issuse.1 March 2024

Image processing methods and Support Vector Machine (CNN) algorithm. The dermoscopy image of Vitamin Deficiency is taken and it goes under various pre-processing technique for noise removal and image enhancement. Then the image is undergone to segmentation using Thresholding method. Some features of image have to be extracted using GLCM methodology. These features are given as the input to classifier. Support vector Machine (CNN) is used for classification purpose. It classifies the given image into Vitamin Deficiencyous or non-Vitamin Deficiencyous

2. Author:ChandrahasaM ,VarunVadigeri and Dixit Salecha(2016) Title: Detection of Vitamin Deficiency using ABCD features

Description:

Smartphones are playing major role in e-health in such a way that m-health is playing a significant role in healthcare industry. Image processing techniques are instrumental in healthcare industry to detect abnormalities in human body. Vitamin Deficiency (Stage 1 Vitamin Deficiency) is one of the most deadly Vitamin Deficiencys, but when diagnosed early, it can be cured. Reports tell that more than million deaths occur due to Vitamin Deficiency itself. This paper speaks about how Vitamin Deficiency can be detected in early stages using smartphone application by analyzing properties of the Vitamin Deficiency, Asymmetry, Border, Color variation, Diameter and Expansion(ABCDE).These properties are analyzed using different image processing techniques like Grey scale conversion, Segmentation, contour tracing and histogram analysis.

3. Author: E. A. Gordon Spratt and J. A. Carucci Title:Methodology for diagnosing ofVitamin Deficiency onimages of dermatologicspots by spectral analysis

Description:

In this paper a new methodology for the diagnosing of Skin TissueVitamin Deficiency on images of dermatologic spots using image processing ispresented. Currently Vitamin Deficiency is one of the most frequent diseases inhumans. This methodology is based on Fourier spectral analysis by usingfilters such as the classic, inverse and k-law nonlinear. The sample imageswere obtained by a medical specialist and a new spectral technique isdeveloped to obtain a quantitative measurement of the complex patternfound in Vitamin Deficiencyous Skin Tissue spots. Finally a spectral index is calculated toobtain a range of spectral indices defined for Vitamin Deficiency.

ISSN2454-9940
www.ijsem.org
Vol 18, Issuse.1 March 2024

4.Author:JosuéÁlvarez-Borrego(2015)

Title: Diagnosis of Vitamin Deficiency using Image Processing Description:

In this paper a new methodology for the diagnosing of Vitamin Deficiency on images of dermatologic spots using image processing is presented. Currently Vitamin Deficiency is one of the most frequent diseases in humans. This methodology is based on Fourier spectral analysis by using filters such as the classic, inverse and k-law nonlinear. The sample images were obtained by a medical specialist and a new spectral technique is developed to obtain a quantitative measurement of the complex pattern found in Vitamin Deficiencyous Skin Tissue spots. Finally a spectral index is calculated to obtain a range of spectral indices defined for Vitamin Deficiency. Our results show a confidence level of 95.4%.

3.PROPOSED SYSTEM

In our methodology, the image is first enhanced by CNN with obtaining the highest frequency components from its Curve let transform and then add it to the original image, in order to sharpen the edge detail. Subsequently the sharpened image is subjected to morphological processing and thresholding to get a binary image, from which boundaries are extracted after morphological processing. In the end, an Otsu algorithm is applied to get normal Skin Tissue and the Vitamin Deficiencyous Skin Tissue. I thus propose a computerized solution for replacing the clinical calculations by feature exatraction.

Wiener filtering

Wiener filtering executes an optimal tradeoff between inverse filtering and noise smoothing. Wiener filter estimates the local mean and variance around each pixel.

A local contrast enhancement method for RGB images utilizes morphological filtering to obtain the scale specific dark and bright features from the input image.

Project procedure involves the following steps:

1. For any segmentation strategy, noise removal is a must, a priori, lest one may get a lot of false edges. Our method starts with the removal of unwanted particles or noise present in the image (I), through the use of Weiner filter to get IW. The latter is useful in thesituations where the purpose is to reduce noise but preserve the edges. Wiener filter is statistical in nature as it adopts a least square (LS) approach for

ISSN2454-9940
www.ijsem.org
Vol 18, Issuse.1 March 2024

signal recovery in the presence of noise. It is very effective in eliminating both the additive noise and blur which are usually competing against each other.

2.A Forward Discrete Curvelet Transform (FDCT) is applied to the input image to get the finest detailed coefficients. The FDCT is a multi-dimensional transform in the sense that not only linear contours but also the curvy edges of the contained objects can be captured through its use. Hence, the Curvelet transform captures the structural activity along the radial wedges in the frequency domain and has a very high directional

sensitivity. It captures singularities with very few coefficients in a non-adaptive manner. The edge and singularity details are processed to extract the feature points.

3.The obtained high-pass image (IHP) is added to IW and we get an enhanced SEM image (Ie). The image would now have stronger edges than the original and would perform better in lending edgedetails to the segmentation step.

4.The mask is further refined via **Mathematical Morphology (MM)** processing, getting (IM), in order to further highlight the image boundaries. The segmented image (IS) is formed by superimposing the mask (IM) on the image IE and the regions are separated by setting all the pixels to 1 that belong to the set of the segmentation boundary.

Advantages:

According to the results and comparison with the results of clinical diagnosis , the proposed method has 94% accuracy in green channel, which indicates a better performance than other color spaces.

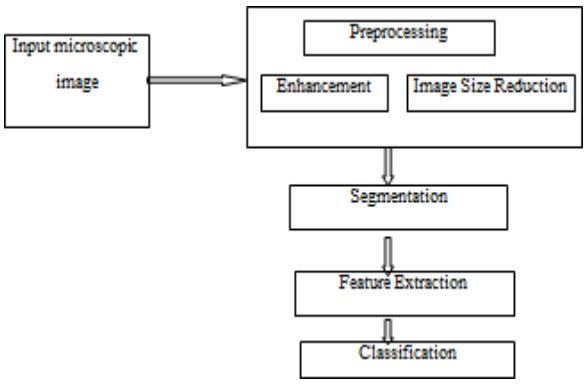
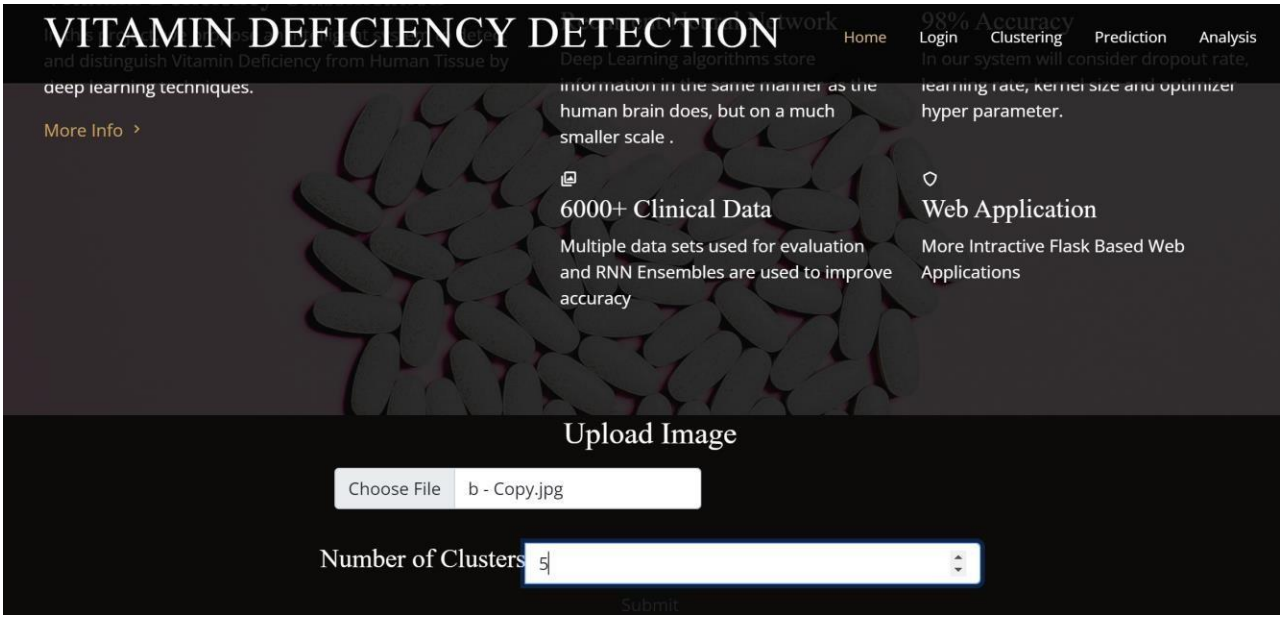
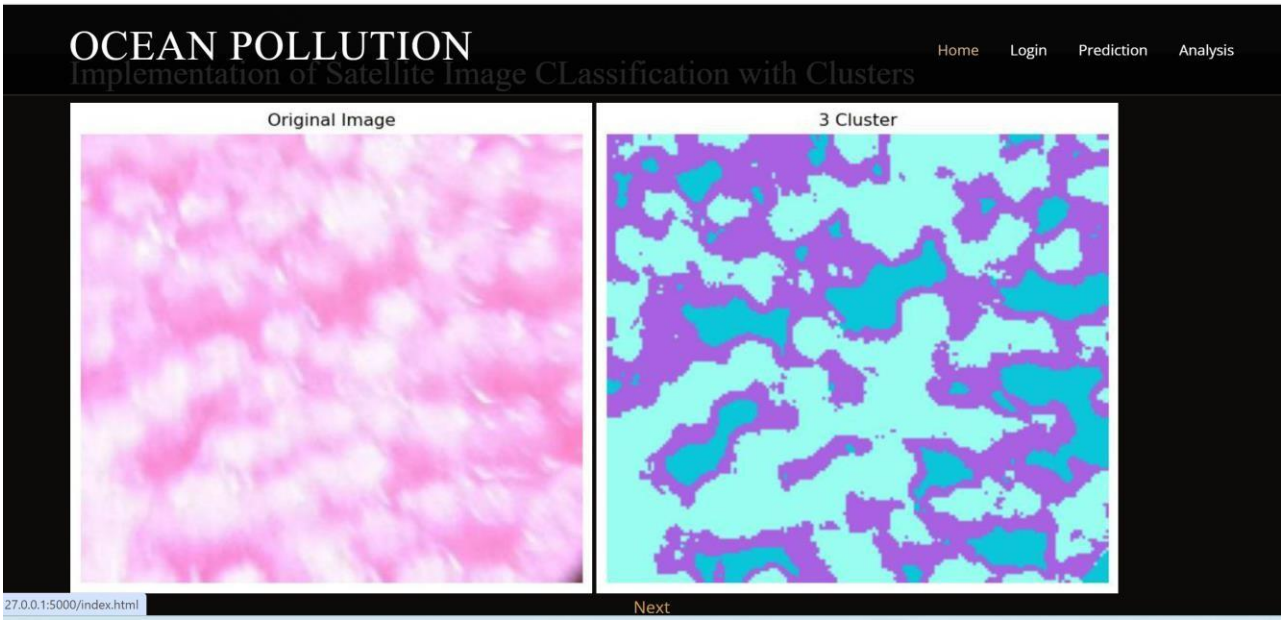


Fig 1:Proposed Architecture

ISSN2454-9940
www.ijsem.org
Vol 18, Issuse.1 March 2024

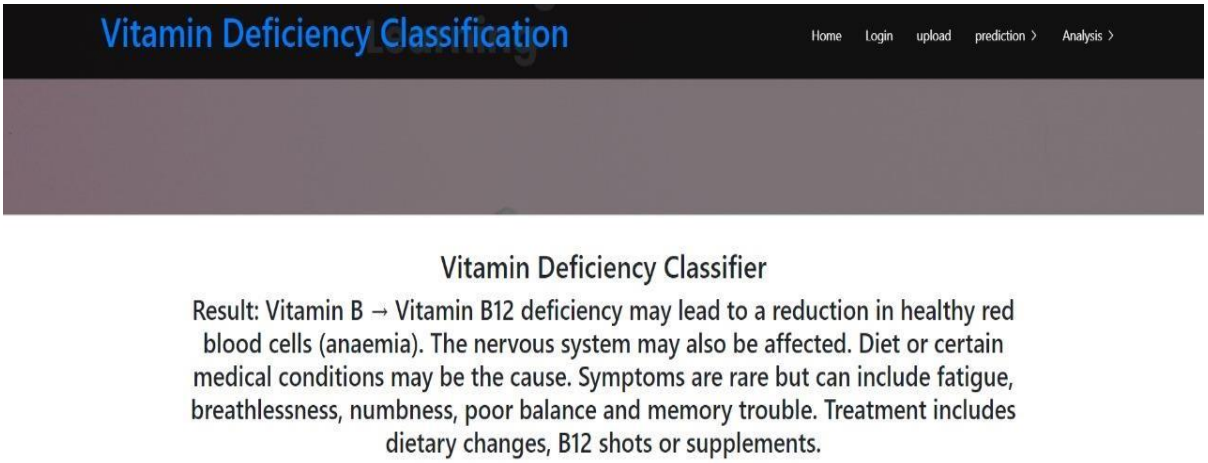
4.RESULTS AND DISCUSSION





INTERNATIONAL JOURNAL OF APPLIED SCIENCE ENGINEERING AND MANAGEMENT

ISSN2454-9940
www.ijsem.org
Vol 18, Issuse.1 March 2024



5.COCNLUSION

This project uses a traditional image processing approach to partition the lesion image for form analysis. After showcasing the dataset and method utilised in this research, performance analysis reveals that the algorithm outperforms the labels in terms of shape extraction. Finally, some improvements are offered to better optimise the method.

RESULT COMPARISON WITH EXISTING SYSTEM

They extracted features like mean, standard deviation, and absolute mean

ISSN2454-9940
www.ijsem.org
Vol 18, Issuse.1 March 2024

from the segmented image using the existing system's 2D wavelet transform. The organization was trainedwith highlights. Along these lines its precision rate is great anyway it very well may be improved for this framework. In our proposed framework we are utilizing wiener channel curvlettransform. The curvelet change is a multiscale directional change that permits a practically ideal nonadaptive meager portrayal of items with edges and are profoundly connected with picture handling and essentially for natural and logical processing. Moreover we are usingOtsu's thresholding strategy it includes repeating through all the conceivable edge esteems and working out a proportion of spread for the pixel levels each side of the limit, for example the pixels that either fall in forefront or foundation

REFERENCES

1. M. J. Eide, M. M. Asgari, S. W. Fletcher, A. C. Geller, A. C. Halpern, W. R. Shaikh, L. Li, G. L. Alexander, A. Altschuler, S. W. Dusza, A. A. Marghoob, E. A. Quigley, and M. A. Weinstock; Informed (Internet course for Stage 1 Vitamin Deficiency Early Detection) Group, “Effects on skills and practice from a web-based Vitamin Deficiency course for primary care providers,” J. Am. Board Fam. Med. 26(6), 648–657 (2013).

2. American Vitamin Deficiency Society.Vitamin Deficiency Facts and Figs. (2014).

3. N. R. Telfer, G. B. Colver, and C. A. Morton; British Association of Dermatologists, “Guidelines for the management of basal cell carcinoma,” Br. J. Dermatol.159(1), 35–48 (2008).

4. A. Kricker, B. Armstrong, V. Hansen, A. Watson, G. Singh-Khaira, C. Lecathelinais, C. Goumas, and A. Girgis, “Basal cell carcinoma and squamous cell carcinoma growth rates and determinants of size in community patients,” J. Am. Acad. Dermatol. 70(3), 456–464 (2014).

5. E. A. Gordon Spratt and J. A. Carucci, “Vitamin Deficiency in immunosuppressed patients,” Facial Plast.Surg. 29(5), 402–410 (2013).

ISSN2454-9940
www.ijsem.org
Vol 18, Issuse.1 March 2024

6. S. Ogden and N. R. Telfer, “Vitamin Deficiency,” Medicine (Baltimore) 37(6), 305– 308 (2009).

7. K. Korotkov and R. Garcia, “Computerized analysis of pigmented Skin Tissue lesions: a review,” Artif. Intell.Med. 56(2), 69–90 (2012).

8. A. O. Berg, D. Best; US Preventive Services Task Force, “Screening for Skin Tissue Vitamin Deficiency: recommendations and rationale,” Am. J. Prev. Med. 20(3 Suppl), 44–46 (2001).