Evaluative Report of the Department

Name of the institution : SADAKATHULLAH APPA COLLEGE	**Name of the Department : COMPUTER APPLICATION**
District : TIRUNELVELI	**State : TAMIL NADU**
Total Number of Departments in the institution :	

Sl. No.	Name of the Department	COMPUTER APPLICATION(BCA)	
1	**Year of Establishment**	2008	
2	**Is the Department part of a School/ Faculty of the Institution**	FACULTY OF SCIENCE	
3	**Names of programmes offered**	BCA	
4	**Number of teaching posts Sanctioned/ Filled**	*Sanctioned*	*Filled*
	2016-17	5	5
	2017-18	5	5
	2018-19	5	5
	2019-20	5	5
	2020-21	5	5
	2021-22	5	4
5	**Number of Research Projects:**	*Nil*	*Total Grants Received*
	2016-17		Nil
	2017-18		
	2018-19		
	2019-20		
	2020-21		
	2021-22		

6	**Inter –institutional collaborative projects and Associated grants received**	*National collaboration Number*	*Grant Received*	*International collaboration Number*	*Grant Received*	
	2016-17	*Nil*				
	2017-18					
	2018-19					
	2019-20					
	2020-21					
	2021-22					
	TOTAL					
7	**Departmental projects funded by DST-FIST,DBT, ICSSR, etc., : Total grants received**	*DST-FIST*	*DBT*	*ICSSR*	*_____Mention name, if others*	
	2016-17	Nil				
	2017-18					
	2018-19					
	2019-20					
	2020-21					
	2021-22					
	TOTAL					
8	**Special research laboratories sponsored by/created by industry or corporate bodies:**					
	2016-17	Nil				
	2017-18					
	2018-19					
	2019-20					
	2020-21					
	2021-22					
9	**Publications:**	*Number of Papers published*	*Number of Books with ISBN*	*Number of Citation Index – range / average*	*Number of Impact Factor – range / average*	*Number of h-index*
	2016-17	3	Nil		3.259	
	2017-18	4	Nil		0.582	
	2018-19	5	Nil	3	4.3	1
	2019-20	5	Nil	6	6.894	2
	2020-21	7	5		4.6	
	2021-22	Nil	7		3.298	
	TOTAL	24	***12***	***9***	***23.135(Average=3.85)***	***3***
10	**Details of patents and income generated**	*Patent details*			*Income Generated*	
	2016-17	Nil				
	2017-18					
	2018-19					
	2019-20					
	2020-21					
	2021-22					

11	**Areas of consultancy and income generated**	*Details*			*Income Generated*	
	2016-17	Nil				
	2017-18					
	2018-19					
	2019-20					
	2020-21					
	2021-22					
12	**Awards/Recognitions received at the National and International level by :**	*Faculty*	*Doctoral/Post doctoral fellows*		*Students*	
	2016-17	Nil	Nil	Nil	2	Nil
	2017-18	Nil	Nil	Nil	4	Nil
	2018-19	Nil	Nil	Nil	2	Nil
	2019-20	Nil	Nil	Nil	4	Nil
	2020-21	Nil	Nil	Nil	3	Nil
	2021-22	Nil	Nil	Nil	Nil	Nil
	TOTAL				15	
13	**How many students have cleared Civil Servicesand Defense Services examinations, NET, SET (SLET), GATE and other competitive examinations**					
		Civil Service	*NET*	*SET (SLET)*	*GATE*	*Other Competitive Exam*
	2016-17	Nil	Nil	Nil	Nil	Nil
	2017-18	Nil	Nil	Nil	Nil	Nil
	2018-19	Nil	Nil	Nil	Nil	Nil
	2019-20	Nil	Nil	Nil	Nil	Nil
	2020-2021	Nil	Nil	Nil	Nil	Nil
	2021-2022	Nil	Nil	Nil	Nil	Nil
	TOTAL	Nil	Nil	Nil	Nil	Nil
14	**List of doctoral, post-doctoral students and research associates**	*From the host institution/university*		*From other institutions/universities*		
	2016-17	**NA**				
	2017-18					
	2018-19					
	2019-20					
	2020-21					
	2021-22					
15	**Number of Research Scholars/ Post Graduate students getting financial assistance from the University/State/ Central**	*University*	*State*	*Central*		
	2016-17	NA				
	2017-18					
	2018-19					
	2019-20					
	2020-21					
	2021-22					

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Rc. No. 101/SF/2008 Date: 19-06-2008.

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*****

Present: Hajee T.E.S. Fathu Rabbani

*****

Appointment Order

Selvi. W. Fathima Farsana, M.Sc., is temporarily appointed as Lecturer in Information Technology (Unaided) with effect from the F.N. of 19-06-2008.

SECRETARY.

19.6.08

To
Selvi. W. Fathima Farsana, M.Sc.,
Lecturer in Information Technology,
649-D/1, 15th Street,
New Nehru Nagar, Thiyagaraja Nagar Post,
Tirunelveli-627 011

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Ramah Nagar,Tirunelveli – 627 011

*****

Present:Alhaj.T.E.S.Fathu Rabbani

RC.No.SAC/UA/2014 **Date:20.08.2014**

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*****

ORDER:

Tmy.R.FATHIMA SYREEN, M.Sc., M.Phil., is temporarily appointed as Assistant Professor in the Department of Computer Science at a consolidated salary of Rs.10,000/- (Rupees Ten Thousand only) per month with effect from 01.08.2014.

This appointment will be governed by the rules and regulations of the Sadakathullah Appa College. If she wishes to leave the college, she will have to give three months' notice or three months' salary in lieu thereof. Notice, if any, should be given before March 31st of the particular year.

Secretary

To

Tmy.R.FATHIMA SYREEN, M.Sc., M.Phil.,
17/614A,24th Street,
Santhi Nagar, Palayamkottai,
Tirunelveli 627002.

20.8.14

22/8/14

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Rc. No.101/SF/2011 Date: 06-06-2011.

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*****

Present: Hajee T.E.S. Fathu Rabbani

*****

Appointment Order

Thiru. M.H. Ibrahim, M.C.A.., is temporarily appointed as Lecturer in the Department of Information Technology with effect from the F.N. of 15.06.2011.

SECRETARY.

To
Ms. M.H. Ibrahim, M.C.A.,
90/109, Hameempuram South Street,
Melapalayam,

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Rahmath Nagar,Tirunelveli – 627 011.

*****

Present:Alhaj.T.E.S.Fathu Rabbani

RC.No.10491/UA/2013 **Date:08.07.2013**

Sub: Unaided Courses Sadakathullah Appa college- Appointment for the post of Assistant Professor in the Department of Computer Science Orders- issued

Ref: Interview on 13.06.2013.

ORDER:

Tmy.S.PIRAMU KAILASAM M.C.A.,M.Phil., is temporarily appointed as Assistance Professor in the Department of Computer Science at a consolidated salary of Rs.8500/-(Rupees Eight thousand five hundred only) per month with effect from 20.06.2013.

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Secretary

To

Tmy.S.PIRAMU KAILASAM M.C.A.,M.Phil.,
325, K.M.K. Street,
Tenkasi,
Tirunelveli-Dist.,

08.07.13

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Rahmath Nagar, Tirunelveli 627 011. Ph : 0462-2540763, Fax : 0462-2540033
E-mail : principal@sadakath.ac.in, Website : www.sadakath.ac.in

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*****

PRESENT : Alhaj. T.E.S. FATHU RABBANI

Rc.No.11786/SAC/UA/2019 Date: 29.04.2019

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Read: Interview on 23.04.2019 and Connected records.

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ORDER :

Mr. S. MOHIDEEN PILLAI, M.C.A., SET., is temporarily appointed as an Assistant Professor in the Department of Computer Application at a consolidated salary of Rs.20,000/- (Rupees Twenty Thousand only) per month.

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SECRETARY

29.4.19

To
Mr. S. MOHIDEEN PILLAI, M.C.A., SET.,
5/121, Sappani Alim East Street,
Melapalayam,
Tirunelveli – 627 005.

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Automated diagnosis of Lungs Tumor Using Segmentation Techniques

Article *in* International Journal of Advanced Trends in Computer Science and Engineering · October 2016

DOI: 10.18535/ijecs/v5i10.22

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www.ijecs.in
International Journal Of Engineering And Computer Science ISSN: 2319-7242
Volume 5 Issue 10 Oct. 2016, Page No. 18350-18357

Automated diagnosis of Lungs Tumor Using Segmentation Techniques

S.Piramu Kailasam[1],Dr. M. Mohammed Sathik [2]
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E-mail:spkpramu@gmail.com
[2]Principal, Sathakathullah Appa College, India
E-mail:mmdsathik@gmail.com

Abstract— The Objective is to detect the cancerous lung nodules from 3D CT chest image and classify the lung disease and its severity. Although so many researches has been done in this stream, the problem still remains a challenging one. To extract the lung region FCM segmentation is used. Here we used six feature extraction techniques such as bag of visual words based on the histogram oriented gradients, the wavelet transform based features, the local binary pattern, SIFT and Zernike moment . The Particle swarm optimization algorithm is used to select the best features.

Keywords— ***Lungs CT, image segmentation, PSO, SVM, ELM, k-NN, NB.***

I. INTRODUCTION

Due to increasing rate of smoking and air pollution lung cancer is main cause for deaths in different countries. CT is the best modality to diagnose the lung disease. Time and cost are the two important factors. The early detection of lung nodule growth cure the disease of the patient. According to staging of lung cancer the severity will be found. The radiologist will help the diagnosis efficiency by calculating the number of nodule growth in stages X rays image is not sufficient for early detection of lung cancer [2], [4]. CT plays an important role on cancer staging evaluation. It is challenging task due to low contrast, size and location variation in CT imaging. Distinguishing the cancerous nodules from the blood vessel is the challenging task because in the central lung regions lung nodules are confused with the blood vessels imaged in cross section. The detection of lung nodule have been found such as feature base, template matching based and neural based. In [5] the organs of interest and lung area was classified in to two clusters, air cluster and other organs cluster. Using Gaussian distribution as reference images, template
matching algorithm is used to detect the nodules in chest CT images. Tuo Xu et al.[1] proposed an automatic global edge and
region force (ERF) field guided method for lung field segmentation. Experimental results demonstrated that the proposed method is time efficient and improves the accuracy, sensitivity, specificity and robustness of the segmentation results. In the lungs accurate lung segmentation allows the detection and quantification of abnormalities. A automatic method for segmentation of the lungs and lobes from thorox CT scans by Van Rikrort et al. [7]. Here region growing approach is used to segment the region and morphological operations are done. Multiatlas segmentation will be applied to the results. Sobel edge [9] detection method is used to segment the CT lung image. Jun lai et al.[8] used a fully automatic segmentation for pulmonary vessals in plain thoraic CT images.

Vessal tree reconstruction algorithm [10] reduced the number of false positives by 38%. Camarlinght et al.[11] has used three
different computer aided detection techniques to identify the pulmonary nodules in CT images.

Abdulla & Shaharun [12] used feed forward neural networks to classify lung nodules in X-ray images and with smaller feature of area, size and perimeter. Kuruvilla et al.[13] have used six distint parameters including skewness and fifth and sixth central moments extracted from segmented single slices and used feed forward back propagation neural network with them to evaluate accuracy . In Riccardi et al[16] the authors presented a new algorithm to automatically detect nodules with 71% overall accuracy using 3D radical transforms . In neuro imaging data of brain using deep Boltzmann machine for AD/MDC diagnosis is done by the author Suk et al. [17]. The method achieves a excellent diagnostic accuracy of 95.52%.To the best of our knowledge there has been no work that uses deep features from lung nodule classification.

In this paper the trainned image was preprocessed then the lung region will be extracted using FCM segmentation. After that we found the lung cancer detection by extracting the features.

Cancerous lung nodules detection from CT chest image

The block diagram of the proposed method is shown in fig.1. To detect the location of the cancerous lung nodules this paper uses a novel algorithm. First we denoised the input image by wiener filter. Contrast is enhanced by histogram equalization. To extract the lung region the FCM segmentation is used. The further details of these are discussed below:

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International Journal of Computer Science and Mobile Computing

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IJCSMC, Vol. 5, Issue. 7, July 2016, pg.194 – 203

Guidance in Assisting the Identification / Interpretation of Lung Cancer using Bronchoscope

S. Piramu Kailasam[1], Dr. M.Mohammed Sathik[2]
[1]Research Scholar, Bharathiyar University, Coimbatore, India
[2]Principal, Sadakathullah Appa College, Tirunelveli, India
[1] spkpramu@gmail.com

Abstract— Lung Cancer is one of the leading disease in the world, and increased in many countries. The eight year overall survival rate is just 17%. We have to remove lung cancer surgically at an early stage to ensure the survival of the patient. There are several methods to treat an early staged lung cancer such as Brachytherapy, Cryotherapy, Photodynamic therapy, Argon plasma cogulation, Thermal laser, micro debrider, electrocautery etc. In this review we are going to discuss various types of bronchoscopy and their positive and negative sides.

Keywords— Lung cancer, bronchoscopy

I. INTRODUCTION

The first sign of evolution of bronchoscope was apparent when a German physician, Gustav killian removed a pork bone from the right main bronchus of a Black forest worker in the year 1897. He had used a similar device with the same limitations as that of a modern bronchoscope includes two types of devices – rigid and flexible each having their own positives and negatives.

II. CHOOSING BRONCHOSCOPY

Bronchoscopic treatment is advisible for treating only lung cancer at an early stage. But bronchoscopy is a cost effective treatment. The patient undergoing treatment should not have low life expectancy. These are some criteria for choosing bronchoscopy. Let us decide which bronchoscopy to choose rigid or flexible. Rigid bronchoscopy is defined as trans oral or trans tracheosomy passage of rigid instruments for diagnosis or therapy aided by various light sources, telescopes and instruments , requiring a general anaesthetic.

Flexible bronchoscopy is defined as a technical procedure that is utilized to visualize the nasal passage from nasal opening to bronchial tree end which is usually carried out under conscious sedation.

Mostly a flexible bronchoscopy is preferable because a rigid brochoscopy requires a lot of skill. Majority of doctors in US and UK lack this skill. But there are some circumstances in which rigid bronchoscopy is advisable.

Traffic flow Prediction with Big Data Using SAE'S Algorithm

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IJCSMC, Vol. 5, Issue. 7, July 2016, pg.186 – 193

Traffic flow Prediction with Big Data Using SAE'S Algorithm

S.Piramu Kailasam (Ph.d)**, K.Aruna Anushiya, Dr. M.Mohammed Sathik**
[1]Research Scholar, Bharathiar University, India
[2]Assistant Professor, MSU College, India
[3]Principal, Sadakathullah Appa College, Tirunelveli, India
[1] spkpramu@gmail.com; [2] anushia@gmail.com

Abstract— Intelligent transportation system is accurate and time based traffic flow information to do best performance . Last few years, traffic data have been huge, existing system used weak traffic prediction models which is unsatisfied. The proposed system is using novel deep learning based traffic flow prediction method, which involves the spatial and temporal correlations inherently. A stack autoencoder model is used to learn generic traffic flow features and it is trained in a greedy layerwise pattern. This is the first time that a deep architecture model is proposed using autoencoders to represent traffic flow features for prediction.

Keywords— Deep learning, stacked autoencoders (SAEs), traffic flow prediction.

I. INTRODUCTION

The traffic flow information is [1] the potential to help road users, which make better travel decisions in traffic congestion and reduce carbon emissions. This will improve traffic operation efficiently. Now days transportation management system and control becomes more complicated data driven. The most of the Traffic flow predication system method is used shallow traffic model which are unsatisfied. Deep learning , which is a type of machine learning method, has a lot of interest academic and industrial level.

Deep learning algorithms use multiple-layer architectures to extract inherent features in data from the lowest to the highest level using deep learning algorithm. Without prior knowledge, we can represent the traffic feature which has good performance in traffic flow prediction.

II. LITERATURE REVIEW

A Traffic flow prediction is a key functional component in ITSs. A countable traffic flow prediction models have been developed to assist in traffic management .These models will control and improving transportation efficiency ranging from route guidance and vehicle routing . The traffic flow can be considered a temporal and spatial process. The traffic flow prediction problem can be stated as follows. Let $Xt\ i$ denote the observed traffic flow quantity during the tth time interval at the ith observation location in a transportation network. Given a sequence $\{Xt\ i\}$ of observed traffic flow data, $i = 1, 2, \ldots, m$, $t = 1, 2, \ldots, T$, the problem is to predict the traffic flow at time interval $(t+\Delta)$ for some prediction horizon Δ. As early as 1970s, the autoregressive integrated moving average (ARIMA) model was used to predict short-term freeway traffic flow [3]. The variety of models for traffic flow prediction have been proposed by researchers from different areas, such as transportation

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A Reliable Computer Aided Lung Cancer Classification System Using Curvelet Features and Ensemble Classifier

S. Piramu Kailasam[1], M. Mohammed Sathik[2]
[1]Research Scholar, Research and Development Centre, Bharathiar University, Coimbatore, India
[2]Principal, SathakathullahAppa College, Tirunelveli, India
piramu.bu@gmail.com

Abstract- **Lung cancer is one of the dreadful diseases, which shows greater mortality rates. The lifespan of the patients can be improved, when the disease is detected earlier. Due to the advancement of medical science, several screening equipments are presented to the society. Computed Tomography (CT) is one of the prominent screening equipments for detecting lung cancer. It would be beneficial for the medical expert, when some reliable computer based assistance is rendered. Taking this into account, this article proposes a computer aided classification system for lung cancer detection by dividing the complete work into four phases. Initially, the contrast of the CT lung images are improved by Adaptive Histogram Equalization (AHE) and the image segmentation is carried out by Kernelized Fuzzy C Means (KFCM). The curvelet features are extracted from the segmented CT image and the ensemble classifier is applied over it. This way of benign and malignant classification results in reliable and accurate results. The performance of the proposed approach is evaluated with respect to accuracy, sensitivity, specificity and time consumption. The proposed classification approach shows better results, when compared to the existing approaches.**

Keywords – Lung cancer, pre-processing, CT image, segmentation, ensemble classification.

1. Introduction

Lung cancer is the fourth commonly occurring cancer next to breast, cervical and oral cavity cancer. Lung cancer is observed more in men rather than women, as per the medical reports. This dreadful disease is observed as the second and sixth mostly occurring cancer in men and women respectively [1]. The mortality rates with respect to lung cancer are improving every year. The main reason for the increased death rates is the ignorance and negligence of periodical health checkups. Early detection of any cancerous growth supports in increasing the lifespan of the patient. Due to the advancement of medical science and computer technology, computer based diagnostic systems come into picture.

As the diagnostic systems assist the physician to make a decision, the reliability of the system is very important. The system is said to be reliable when the accuracy rates are reasonable. However, achieving better accuracy rates is a challenging task, as the images contain several unnecessary details. In spite of the presence of numerous lung cancer detection systems, there is a constant demand for a reliable system. Taking this challenge into consideration, this work attempts to propose a novel computer based diagnostic system for lung cancer detection by incorporating advanced image processing techniques over Computed Tomography (CT) images.

The entire work is decomposed and organised into four important phases, which are CT image pre-processing, segmentation, feature extraction and classification. The image pre-processing phase makes the CT images fitter for the forthcoming processes. Usually, the pre-processing phase attempts to enhance the quality of image by incorporating the noise removal or the contrast enhancement procedure and so on. The segmentation phase focuses on extracting the regions of interest from the whole image, such that the segmented regions alone are processed. The efficiency of the classification system improves, when specific regions of CT images are focussed. The features of the segmented regions are extracted, which are rich enough for the classifiers to detect the abnormalities being present in the CT images.

The rest of this paper is organized as follows. A short review of the state-of-the-art literature with respect to lung cancer detection is presented in section 2. Section 3 presents the proposed lung cancer detection approach in a detailed manner. The performance of the proposed approach is analysed by executing several comparative analysis in section 4. The concluding points of this article are summed up in section 5.

2. Review of Literature

The purpose of this section is to review the recent literature with respect to lung cancer detection systems. Several image processing techniques for the detection of lung cancer by using CT images are reviewed in [1]. The lung cancer detection is carried out by splitting the review in different aspects such as pre-processing, nodule segmentation and segmentation. The recent trends in lung nodule detection are presented in [2]. Additionally, the performance of the recent lung nodule detection techniques is compared and presented. In [3], a lung cancer classification system is proposed on the basis of wavelet recurrent neural network. This work employs wavelet to remove the noise from the input image and recurrent neural network is utilized for classification. However, this work cannot achieve better specificity rates and this implies that the false positive rates of the work are greater.

A lung cancer detection technique, which is based on Local Energy based Shape Histogram (LESH) and machine learning techniques is introduced in [4]. Initially, this work pre-processes the CT images by Contrast Limited Adaptive Histogram Equalization (CLAHE) and the LESH features are extracted. A new lung cancer detection technique based on Mumford-Shah algorithm is proposed in [5]. This work removes the Gaussian noise by applying sigma filter and the regions of interest are segmented by otsu'sthresholding and mumford-shah model is applied. The texture features are extracted from the extracted regions by spectral texture extraction technique and the classification is done by multi-level slice classifier. An automatic lung nodule segmentation and classification technique is proposed in [6]. The areas of interest alone are extracted by means of priory

Contourlet Transform Based Denoising On Normal Images Using ABC Optimization With Hard Thresholding Contourlet Transform With ABC Optimization

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Contourlet Transform Based Denoising On Normal Images Using ABC Optimization With Hard Thresholding

Contourlet Transform With ABC Optimization

[1]Syed Ali Fathima KMN, [2]W. Fathima Farsana and [3]R. Fathima Syreen,
[1]Research Dept. of CS, Sadakathullah Appa College, Tirunelveli, India
[2]Asst.Professor & Head, Dept.of BCA, Sadakathullah Appa College, Tirunelveli, India.
[3]Asst.Professor, Dept.of BCA, Sadakathullah Appa College, Tirunelveli, India.

Abstract— Digital Images are generally corrupted by noise, Noise is nothing but addition of unwanted information for the Original Image. Removal of the noise is necessary to reduce the minimal damage of the image, improve image details. Contourlet transform is employed with the directional filter bank to capture the discontinuities of line and it gives various directional decomposition.ABC algorithm is bio-inspired algorithm which is derived from intelligent food search nature of the honey bee. ABC as an optimization tool provides a population-based search procedure in which individuals called foods positions are modified by the artificial bees with time and the bee's aim is to discover the places of food sources with high nectar amount and finally the one with the highest nectar. The hard thresholding will kill all the coefficients whose magnitudes are less than the threshold to zero while keeping the remaining coefficients unchanged. Contourlet with image denoising with ABC optimization based hard thresholding it improves the image quality.

Keywords- *component; Contourlet Transform;Laplacian Filter Bank; ABC Optimization;Hard Thresholding*

I. INTRODUCTION

Image denoising has remained a fundamental problem in the field of image processing. Image denoising involves the manipulation of the image data to produce a visually high quality image. The restored image should contain less noise than the observations while still keeping sharp transitions (i.e. edges) Image denoising is to eliminate the noises as well as to conserve the details of an image. Image denoising is a fundamental step in the image processing. Image Denoising is to confiscate the unnecessary noises at the same time it preserves the main characteristic of the information and its enhance the image clarity also. The main focus of an image denosing is to accomplish noise reduction and maintain the quality. Digital images plays an notable task in daily life application such as Natural images such as Lena and cameraman. Corruption may come in many forms such as motion blur, noise and camera mis-focus

Noise can corrupted by different intrinsic and extrinsic conditions. In practical situation its not possible to avoid a noises. Noises may be additive and Multiplicative. Additive noises are always interrupted with natural images. Removing the noise from the image to increase the overall quality of the processed image.

Contourlet is the greatest method for preserving the edges. Contourlets form a multiresolution directional tight frame designed to efficiently approximate images made of smooth regions separated by smooth boundaries. The contourlet transform has a fast implementation based on a Laplacian pyramid decomposition followed by directional filter banks applied on each bandpass sub band. The contourlet transform is shown to be more effective in recovering smooth contours, both visually as well as in PSNR. The contourlet transform is applied for the noisy image to produce decomposed image coefficients. Basically Contourlet transform is a double filter bank structure. It consists of a Laplacian pyramidal filter followed by a directional filter bank. First the Laplacian pyramid (LP) is used to capture the point discontinuities. Then directional filter bank (DFB) used to link point discontinuities into linear structures.

The hard-thresholding function chooses all contourlet coefficients that are greater than the given threshold λ and sets the others to zero. The threshold λ is chosen according to the signal energy.

ABC as an optimization tool provides a population-based search procedure in which individuals called foods positions are modified by the artificial bees with time and the bee's aim is to discover the places of food sources with high nectar amount and finally the one with the highest nectar. Artificial Bee-colony (ABC) to improve the accuracy of denoised image.

II. DENOISING PROCEDURE

The procedure to denoise an image is given as follows:

De-noised image = W−1 [T{W (Original Image + Noise)}
Step 1: Apply forward Contourlet transform to a noisy image to get decomposed image.
Step 2: Apply hard thresholding to decomposed image to remove noise.
Step 3: Apply inverse Contourlet transform to thresholded image to get a denoised image.

Contourlet gives high degree of directionality. It can easily symbolize the curves and lines without discontinuity. The intension of image denoising is to eliminate the noises as well as to conserve the details of an image. Contourlet transform is to preserve the edges and contours. After Hard thresholding function are used, The contourlet transform was proposed as a directional multiresolution image representation that can efficiently capture and represent singularities along smooth object boundaries in normal images, and take inverse transform to reconstruct the original image, Artificial Bee-colony (ABC) to improve the accuracy of denoised image.

International Journal of Scientific Research in Computer Science Applications and Management Studies

e-Certificate

This is to certify that the Author **W.Fathima Farsana** has published the paper titled ***"Review On Fetal Head Detection Techniques in 2D Ultrasound Images"*** in Volume 7, Issue 4(July, 2018) of our journal IJSRCSAMS.

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Classification of Solitary pulmonary Nodule/Blob Images Using Improved Local Binary Pattern [Z⊕ŻLBP]

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Abstract

The Solitary Pulmonary Nodule(SPN) in chest radiographs of 3DCT at risk population is an alert signal to lung cancer. In this paper, an improved feature vector named Z with Ż Local Binary Pattern [Z⊕ŻLBP] is proposed for extracting solitary pulmonary blob image features powerfully. The goal is to reduce Local Binary Pattern (LBP) complexity by reducing the size of the feature vector. In the proposed work by dividing the vicinity pixels in to non-overlapped groups of Z and Ż (Tilted Z) further texture features of pulmonary images are extracted for feature extraction. The Single Classifier KNN has been used with distance metric for classification purpose. Performance Evaluation Metric Accuracy and F-measure are used to measure the proposed system.

Keywords: *Classification, Pulmonary Image, Feature Extraction, Active Contour, KNN Classifier*

Introduction

Pulmonary images are very much important to detect lung diseases using CT imaging modality for the assessment of pulmonary blobs which is Region of Interest. The feature types of the pulmonary bolb(ROI) in CT images are important cues for the malignancy prediction [1-2], diagnosis and advance management [3-4].The texture features of blob solidity and semantic morphology feature of speculation are critical to differentiate of pulmonary blobs region and other subtypes. Meanwhile other semantic features calcification pattern, roundedness, margin clearness are shown to be helpful for the evaluation of blob classification. The region of interest may be found in bronchial tubes or outside of bronchial tube. If the blob<=3mm the detection of malignancy is difficult. The determination of clinical characteristics may differ from patient to patient and also depends on experience of the observer. Computer aided diagnosis is an assistive software package to provide computational diagnostic references for the clinical image reading and decision making support. The histogram features for the high level texture analysis helped to extract blob or blob feature. Ciompi et al [5] developed the bag of frequencies descriptor that can successfully distinguish 51 speculated blobs from the other 204 non-speculated blobs. However, the mapping is from the low level image features toward the high level semantic features in the domain of clinical terms is not straight forward task This semantic feature assessment maybe useful for clinical analysis. The Lung Image Database Consortium (LIDC) dataset for its rich annotation database supports the training and testing CAD scheme[6-7]. The blobs diameters larger than 3mm are further rated by radiologist referred with semantic features of ”subtlety”,

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”calcification”, ”spericity”, ”margin”, ”speculation”, ”texture”, ”lobulation”, ”internal structure” and “malignancy”[8].

Absorption and scattering of illumination rays are the two major issues that cause reduced quality of images. Several methods have been proposed to enhance the quality of the pulmonary images. Histogram equalization technique, Contrast stretching methods capable to enhance the image quality. Contrast Limited Adaptive Histogram Equlization (CLAHE) has been applied to improve the image contrast. Otsu’s adaptive thresholding method form image segmentation has been effective for many applications[9]. This provides bright backgrounds for images. Various thresholding techniques such as Local, Global and Multilevel thresholding have been applied for the segmentation of pulmonary bolb images. The slice thickness of the LIDC CT Scans ranges from 1.25mm to 3mm[10,11]. The texture feature descriptor that has been widely used for image classification is Local Binary Pattern. Pican et al. have used GLCM’s twenty four types features for extraction and for each image suitable features have to be chosen for extraction. Hence there is a need of efficient feature descriptor for classification process. In past years Neural Network is performed for classification results time consuming. K-Nearest Neighbour as classifier with Euclidean distance used to classify blobs. Padmavathi et al[15] have classified images using probalisitic neural network which gives better results than SIFT algorithm with three classes of dataset. Eduardo et al have classified images using nine machine learning algorithms such as: Decision Trees, Random Forest, Extremely Randomised Trees , Boosting, Gradient Boosted Trees, Normal Bayes Classifier, Expectation Maximization, NN and SVM. Bhuvaneswari.P et al[16] have classified coral and textures using KNN by considering K=1 and the accuracy reported as 90.35%.

The main tasks in this paper are in 4 steps as follows:

1. The features of blobs are enhanced from LIDC dataset.
2. The dimension of the LBP feature vector is condensed by novel feature descriptor Z with Tilted Z Local Binary Pattern [Z$\oplus\dot{Z}$LBP].
3. The Complication is reasonably reduced and accuracy is raised from existing Center Symmetric Local Binary Pattern and Orthogonal Combination of Local Binary Pattern.
4. KNN with distance metric have been used.

Proposed Work

To find artfaceted of image, Adaptive Histogram Equalization (AHE) method applied to homogeneous regions of the pulmonary blob. This blur problem has been overcome by Contrast Limited Adaptive Histogram Equalization (CLAHE) method. It avoids the magnification of noise that might limit the artifactuals.

Figure 1: Pulmonary image

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Review On Fetal Head Detection Techniques in 2D Ultrasound Images

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***Abstract*-Accurate diagnostic of fetal Head Detection is one of the most important factors in assessing fetal growth during pregnancy. There are so many techniques used for automatic measurement of the fetal Head. This paper mainly reviews some techniques proposed in past years for automatic detection of fetal Head in 2D ultrasound images.**

***Keywords*—fetal head circumference, fetal measurement, bi-parietal diameter (BPD), abdominal circumference (AC), Region of Interest (ROI), Ultrasonography (USG).**

I. INTRODUCTION

ULTRASOUND (US) is widely used for pregnancy diagnosis because it is radiation-free, real-time, and inexpensive. The general purpose of the ultrasound examination is to determine the location of the fetus and the placenta, the number of fetuses, the gestational age (GA) and estimated day of delivery (EDD) and to detect anomalies as a basis for further fetal medical management. Common fetal ultrasound measurements include: bi-parietal diameter (BPD), head circumference (HC), abdominal circumference (AC), and femur length (FL). : 1) the quality of the measurements are user-dependent, 2) the exam can take more than 30 minutes, and 3) specialists can suffer from Repetitive Stress Injury (RSI) due to these lengthy exams. Head circumference (HC) is one of the most important biometrics measured in the second and third trimester. It is also a most important biometrics in assessing fetal growth during prenatal ultrasound examinations. However, the manual measurement of this biometric by doctors often requires substantial experience. The skull is often only partially visible in US images. These missing boundaries make it difficult to accurately extract and fit the whole skull. Because of the complex fetal posture within the uterus, fetal head US images may contain other anatomical structures with intensities that are similar to those of the skull. They may have failed because of the missing boundaries of the skull. Most of the existing intensity-based methods are not really effective. Several techniques have been proposed by several people for automatic detection of fetal Head Circumference (HC). In this paper we will discuss about some techniques that help detecting the fetal head.

II.FETAL IMAGE PREPROCESSING

The main problem in fetal ultrasound images are they have more speckle noises and artificial borders, have very poor qualities that cause the diagnosis more difficult, For fetal head detection on ultrasound images, the skeletons of fetal head skulls should be extracted as the bright object in pre-processing. In this paper [7] they use two filters Anisotropic diffusion filter (ADF) is used to reduce the speckle noise and Discrete wavelet transform filter (DWT) is used for decomposition and reconstruction.

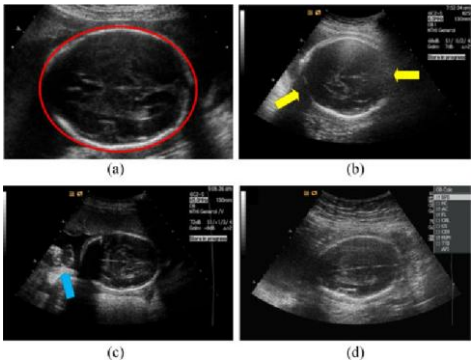

Fig 1 Ultrasound Fetal Head Images

They reclaim discontinuous edge and non stationary signal problems. They compare the result of the two filters ADF does not improve the image quality and the DWT method gives high performance.

EVALUATION OF IMAGE ULTRASOUND SEQUENCE QUALITY IN TERM OF FETAL HEAD DEFECTS

Metrics	PSNR	MSE
DWT	82.4±0.1	0.0024±10¯4
ADF	80.4±0.1	0.0030±10¯4

In this paper [4] the pre-processing is based on the gray feature of ultrasound images, they could extract the basic skeletons of fetal head skulls. They use a bilateral filter to reduce the speckle noise and a white top-hat transform is used to increase the contrast. After that they apply a k-means clustering algorithm. To reduce the noise impact in the k-means method they use a global thresholding to convert the intensity image into binary image then the bright object is extracted from the background. And they apply a binary morphological opening operation to remove some small bright operations and morphological dilation to smooth the boundaries of the large bright objects .In this paper [11] they convert the USG image to the form of digital image. Then the region of interest is calculated using various shapes of cropping like rectangular, circle and ellipse and find out the

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FOOD IMAGE PROCESSING TECHNIQUES: A SURVEY

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ABSTRACT

As people across the globe are becoming more interested in watching their weight, eating more healthy and avoiding obesity, a system that can measure calories and nutrition in every day meals can be very useful. To identify food items accurately in such systems, image processing is used. Image processing techniques like image segmentation, feature extraction, object recognition, classification is used for food recognition, nutrients identification and calorie calculation. Bag-of-Features model, Artificial Neural Networks is used to identify the food items. Image classifiers are trained to identify and categorize individual food items in single image. This survey addressed various food image processing techniques, evaluates them and presents the issues related to those techniques.

Keywords: Food recognition, Segmentation, Classification

[1] INTRODUCTION

One of the major goal of food image processing is to retrieve calorie and nutrient information from the given food image. Food recognition is worthy of more research effort owning to its practical signification and scientific challenges. Food recognition exposes new challenges to the current pattern recognition literature and stimulates the stemming of novel techniques for general object recognition. In addition, automatic food recognition is beneficial to health care related applications, such as obesity management.

Obesity has become a serious public health problem to general population in many developed countries [1], [2].The WHO defines obesity based on the Body Mass Index (BMI) of the individual. A person is considered obese when the BMI is greater than or equal to 30(kg/m^2) [2].Thus it is noticeable that obesity and overweight are linked to a number of chronic diseases such as type II diabetes, breast and colon cancer and heart diseases. The main cause of obesity is the imbalance between the amount of food intake and energy consumed by the individuals [3].Obesity treatment requires the patient to

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A generic approach for human lungs CT scan Image analysis using Deep learning technique

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ABSTRACT:

The lower part of the human lungs (HL) has increased, in which many unknown events are coming. In complex tuberculosis, restoration of hanging in lungs, prevent further complications and eliminate bacteria. Complex Neck Run Management is still controversial, and surgery is one of the cures that should be estimated according to its role in treating complicated illness. This study is a case-based case report. The database used for finding literature is cocaine, medical and proposal. The main word Primary lungs ninety runner, surgery, pulmonary ambulance and baby search. The quality added is , under 18 years of children. As per the diagnosis of 2019, according to evidence, Arthy Centre was organized according to Medical to Medicine. Six joint studies have been analyzed. Surgery was diagnosed for surgical patients, who did not respond to the treatment. It should be noted that standard DLT-WOO,CBX,CMC dataset is tested before using and therefore it may differ from existing usage. At the same time, We go into the lungs Acquisition after acquisition we become one 96.77% accuracy Deep learning technique (DLT Method) there are instructions suhisen algorithm using on lung prevention. However, compared with surgery, with lower part of the complicated lungs there is better death and patient among children.

Keywords - *lungs, surgery, treatment, patient,Sushisen algorithms,DLT*

INTRODUCTION

The analysis 9.6 million new cases and 1.5 million deaths were reported in tuberculosis (TB). Of the new cases, there are 1 million child cases. The prevalence of pulmonary tuberculosis in children is on the rise, and many cases remain. [1] Early oral therapy was the best predictor of childhood tuberculosis, however, due to prolonged treatment, incomplete treatment, relapse, and increased risk of complications.

Treatment of complex lung tuberculosis was not limited to bacterial eradication, but to return to normal lung function and prevent further complications. Recovery surgery with physical abnormalities in 3,4 complex tuberculosis patients with functional disruption and antitubercularis. Recovery surgery is the only treatment for pulmonary tuberculosis in children with permanent bronchial destruction. By combining oral therapy and surgery with the right type and timing of surgery, complications can be stopped and lung function recovered.

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A Survey on Pulmonary CT Image Classification

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Abstract

Image Classification is a recently developed Soft computing method to classify image data with pixel information in a way that only hybrid technique can do better access using the pixel data in the aspect of performance measures. Classification is used to predict the unknown data. Lung Cancer is one of the leading diseases in the world and increased in many countries. The eight years overall survival rate is just 17%. Early to remove lung cancer surgically will ensure the survival of the patient. Before surgery a doctor needs help of radiologists suggestion. In digital era, fast CAD's system plays a vital role in surgery. In this junction, medical image analysis, image classification, image detection and diagnosis involved much in past decades. Pre-processing and Segmentation are the preliminary basic works for binary classification.

Keywords: Image Pre-processing, Image Enhancement, Descriptor, Image Classification

I . Introduction

The purpose of this section is to review the recent literature with respect to lung cancer detection systems.

1.1 PreProcessing

Several image processing techniques for the detection of lung cancer by using CT images are reviewed in (Niranja.G et al., 2017). The lung cancer detection is carried out by splitting the review in different aspects such as pre-processing, nodule segmentation and segmentation. The recent trends in lung nodule detection are presented in (Rabia Naseem et al., 2017). Additionally, the performance of the recent lung nodule detection techniques are compared and presented. In (Devi Nurtiyasari et al., 2017), a lung cancer classification system is proposed on the basis of wavelet recurrent neural network. This author employs wavelet to remove the noise from the input image and the recurrent neural network is utilized for classification. However, this author could not achieve better specificity rates and this implies that the false positive rates of the work are greater.

The lung cancer detection algorithm based on FCM and Bayesian classification is presented in (Bhagyarekha.U et al., 2016). In this paper, FCM is applied to achieve segmentation and the GLCM features are extracted. Based on the feature set, the Bayesian classifier is employed to distinguish between the normal and cancer affected CT images. Yet, the results of this work are not convincing in terms of sensitivity and specificity rates. In (Manasee KurKure et al., 2016), a lung cancer detection technique that relies on genetic approach is proposed. However, this work involves more time complexity and the number of connected objects have been calculated by assigning 1 to inside and 0 to outside of the object that shows brain MRI image based on threshold technique to improve the skull stripping performance (Nilesh Bhaskarrao Bahadur et al., 2017).

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Image fusion on PET/ MRI Images Using Inverse Wavelet decomposition Transform

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ABSTRACT

In this paper a simple and improved medical fusion approaches for PET / MRI images. Image fusion produces merging of two or more images to get the most relevant characteristics of image. The input image is applied by discrete wavelet transform technique to get synthesized image. This paper focuses on applying wavelet decomposition method inverse discrete wavelet decomposition method on PET / MRI images in pixel and structure level. The resultant fused image preserves the possible important information from input images and not introduce artefacts also noises reduces in maximum extent. The parameters MSE, PSNR, RMSE showed good results for PET / MRI images.

Keywords : Image Decomposition, Positron Emission Tomography, iDWT, Fused image

INTRODUCTION

Positron emission tomography has been utilized in various medical diognosis applications[1-3]. PET or SPECT data require an activity map of radiotracer distribution of the lung or brain scan images. PET images are suffered by notable noises, because of dosage and image acquisition in seconds. Hounsfield greater than 600 were considered to be bone after thresholding process in CT images. The attenuation maps were helpful to identify bone tissue.

A high noise in PET images lead to diagnosis the type of diseases. PET scans generate 3D images of ROI. A shrived substance tracer in injected and traced throughout the blood circulation to attain target are of interest. If a positron interacts with anklectron , which generates 2 gamma photons in opposite directions . The PET detector array scanner measured the photons. So it impossible to locate the current active region and organ activity also revealed. A radio nuclide is (18F) flurodexyglucose (FDG) which is short lived nature in PET scanner. Due to low resolution of PET image it is combined CT or MRI data to enhance the functional data. This requires the registration of the generated volumetric PET /CT/MRI datasets. The registration of image in however difficult since the scanned object has to moved to another prescribed scanner. This causes the position and orientation of the object. This complicates the matching of ROIs. These are aggravated by multilevel of resolution of image. This CT/MRI/PET/SPECT data renders the matching of properties difficult. Thus the PET scanning is costlier than other modalities. PET scanner have good ability to characterize the metabolite activity. Added with it is good in searching for metastases of cancer. The reconstruction of the PET image diagnosed region area , the expectation maximization is adopted. This gives a maximum likelihood estimate. The ML-DM accurately find the position noise characters from many iterations of PET data. This increases the noises of PET hence the quality of the images decreases. In order to reduce noise we need preknowledge of image data for reconstruction process. Post filtering has been applied in some PET devices. Gaussian filtering used for Post filtering process. Gaussian filter is a linear low pass filter also a filter mask has in bell shaped curve with centre and symmetric tapering section in either side . The weights of Gaussian filter are calculated using Gaussian function. The NLM an d BM3D algorithm constantly suggested for denoising process in recent upcoming times.

In the clinical diagnosis, the problems regarding images like MRI-PET, CT-PET, and CT-MRI were discussed frequently in medical field. So as to provide more useful information for clinical diagnosis, there is a necessity to combine useful information from various device images. SPECT – CT are useful to study about vascular blood flow test in abdominal and ultrasound images [1]. The integrated scanners perform in immediate sequence without changing the patients position. The improved images will enable doctors to see the condition of organs of astronauts hearts, which is a NASA project in space[2]. Image Fusion can be categorized in to pixel level , feature level , signal level and decision level. Pixel level image fusion is going to discussion in upcoming sections. Image fusion based on wavelet multiresolution technique followed by PCA technique in given in next section. Comparative analysis is brought by section also continued by Conclusion section.

II.Material and Methods

Pixel or Spatial Level Image Fusion

Image fusion can be done by many methods like technical fusion, multiplicative fusion, subtractive fusion, PCA fusion, IHS fusion , Brovery , Color related technique and wavelet technique. The source image combined with single

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Pulmonary CT Image analysis for Nodule Detection using Inspired FCM Clustering

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***Abstract*—The segmentation of white blob nodule area from pulmonary CT images are tedious and time consuming task. The accuracy of nodules as tumor depends on the radiologist experience only. Hence the CAD still necessary to overcome these limitations. In this study to improve the performance and reduce the complexity of segmentation, adaptive histogram equalization method and Fuzzy C means applied with high level iterations. Further to improve the accuracy local and global threshold also used. The resultant parameters mean , median showed good accuracy results.**

Keyword— Pre-processing; Global Threshold; Fuzzy C Means(FCM); Segmentation

I. INTRODUCTION

Image Segmentation is the process that segment an image into many disjoint small area based on the certain principle, and it is the one of the most basic area of research in the image processing. Image segmentation is used in many applications; with Image Retrieval it is possible to analyse the images in Geology Information Systems, Medical Image Analysis, Film and Photo Analysis etc.

II. RELATED WORKS

Many image processing techniques for the detection of lung cancer by using CT images are reviewed in [1], lung cancer detection is carried out by splitting the review in different aspects such as pre-processing, nodule segmentation and segmentation, lung nodule detection are presented in [2], the performance of the recent lung nodule detection techniques are compared. A lung cancer classification system[3] is proposed on the basis of wavelet recurrent neural network also employs wavelet to remove the noise from the input image and the recurrent neural network is utilized for classification. Perhaps, this author could not achieve better specificity rates and this implies that the false positive rates of the work are reasonably greater. In paper [4], FCM is applied to achieve segmentation and the GLCM (Gray Level Co - occurence Matrix) features are extracted. The author Manasee[5] says a lung cancer detection technique that relies on genetic approach is proposed, this work involves more time complexity and the number of connected objects have been calculated by assigning 1 to inside and 0 to outside of the object that shows the medical image based on threshold technique to analyze the performance.

A. *Segmentation Techniques*

Some of the image segmentation methods are Local entropy image segmentation [6]. A Discrete cosine texture feature is applied by [7].The parallel algorithm for grey scale image was clearly declared[8]. Clustering of spatial patterns and watershed algorithm[9] is done. Medical image segmentation performed [5] in the year 2010. Iterative regularized likelihood learning algorithm [11]is performed well by Zhi Lu . The Automatic model selection and unsupervised image segmentation by Zhi Wu Lu , finite mixtures and entropy regularization by Zhi wu Lu [12] is well delt in the paper.

As described by the Sun Hee Kim[13] , acquisition of the image, extraction of the region , intensity and noises of the image affect the accuracy. Resize the image to process in matlab. also another measurable factor. The image processing is applied to separate the region of nodules and backgrounds. Then the smaller size is obtained by processing it in matlab12a. The array editor convert the image to values. Identify the cluster where nodules are present by iterations. The place where the nodules are there shows higher value because of brightness. The conversion of the image to array editor values done by Harvey A et al., [14].

Among the large number of lung segmentation methods bidirectional differential chain code combined with machine learning framework is able to correctly include the just a pleura nodules into the lung tissue on minimizing over segmentation. This method identifying low-dose, concave/convex regions [15]. In the Hessian-based matrix approach, 3D lung nodule segmented in the multiscale process through the combination of Shape and Curvedness methods. Image characteristics, Nodule position, nodule size, and nodule characteristics are included also Eigenvalues are computed from the 3 x 3 Hessian Matrix .

B. CT Image Pre-processing by AHE

The contrast of the CT images is enhanced by employing adaptive histogram equalization technique, which is versatile for both greyscale and colour images. Kernelized Fuzzy C Means (FCM) is utilized to segment the CT images, which shows better performance than the standard FCM. Unlike Histogram Equalization, Adoptive Histogram Equalization works with region of image. FCM

A Review on Deep Learning Based Object Detection and Part Localization

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***Abstract*—The rapid growth of image data leads to the need of research and development of image retrieval. Compared to normal image, fine grained images are difficult to classify. Recognizing objects in fine grained domains can be extremely challenging task due to subtle differences and variations in poses, scales and rotations between same species. Deep Learning has recently achieved superior performance on many tasks such as image classification, object detection and neural language processing. In this survey we mainly focus on the object detection, semantic part localization and feature extraction which can facilitate fine grained categorization.**

Keywords—fine grained images;Deep Learning; object detection;part localization.

I. INTRODUCTION

Fine Grained object classification aims to distinguish objects from different sub ordinate level categories within in a general category. Fine grained classification is a very challenging task due to large inner-class variance and subtle inter-class distinctions. Variances in the pose, scale or rotation make the problem more difficult. In the recent years fine grained image classification has received considerable attention due to the advancement of deep learning based approaches. Layers of the features in deep learning techniques are not human designed instead learned from data using a general purpose learning procedure. There are large number of variants of deep learning architecture. In this survey we mainly focus on convolutional neural network (CNN) based approaches. Convolutional neural network(CNN) are surpassing other approaches in terms of accuracy and efficiency in a large margin. CNN is a type of feed-forward artificial neural network. It consists of one or more convolutional layers which are the building block of a CNN. The convolutional layers are then followed by one or more fully connected layers as in a standard multilayer perceptron(MLP).Most deep learning networks can be trained end to end efficiently using backpropogation.it is a common method of training artificial neural network used in conjunction with an optimization method such as gradient descent. In this survey ,we first introduce several convolutional neural networks which are mostly used for fine grained image categorization. Then part localization and object detection based approaches. The last section will review about feature extraction based approaches.

II. GENERAL DEEP NETWORK ARCHITECTURES

CNN is able to yield more discriminative representation of the image which is essential for fine grained image classification. AlexNet[1] is a deep convolutional neural network which won the ILSVRC-2012 competition with a top-5 test accuracy of 84.6% compared to 73.8% accuracy achieved by closest competitor. It consists of five convolutional layers, max pooling ones, Rectified Linear units(ReLus) as non-linearities, three fully connected layers. The Visual Geometry Group(VGG)[2] model has been introduced by visual Geometry Group from the university of Oxford.The VGG-16 has 13 convolutional Layers with 3 fully connected layers.VGG-19 has 3 more convolutional layers than VGG-16 model. Filters with a very small receptive field is used. All hidden layers are provided with the rectification non-linearity.

GooLeNet[3] is a network which won the ILSVRC-2014 challenge with a top-5 accuracy of 93.3%.This CNN is composed of 22 layers and a newly introduced building block called inception modules. The inception module allows for increasing the depth and width of the network while keeping computational budget constant. The 1x1 convolutions are used to compute reductions before the expensive 3x3 and 5x5 convolutions.

III. PART DETECTION BASED APPROACHES

A. SPDA-CNN For Part Detection

The semantic part detection and abstraction CNN architecture[4] uses two sub networks. One for detection and one for recognition. The detection sub-network uses a novel top-down method to generate small semantic part candidates for detection. The classification sub-network uses a novel part layers that extract features from parts detected by the detection sub-network and combine them for recognition. In detection sub-network k nearest neighbour(k-nn) method is used to generate proposals for semantic parts. Using k-nn, the detection network applies Fast R-CNN[] to regress and obtain much more accurate part bounding boxes. The final part detection are sent to abstraction and classification sub-network.

Based on the results from detection, the part Rol pooling layer does semantic pooling. This layer conducts feature selection and reordering which are useful for classification. By sharing the computation of convolutional filters, SPDA provides an end to end network that performs detection, localization of multiple semantic parts and whole object recognition within one framework.

B. Deep LAC

To recognize fine grained classes, the Deep LAC[5] incorporates part localization, alignment and classification in one deep neural network.it proposes Valve Linkage Function(VLF) for back-propagation chaining. The main network consists of three sub-networks for localization, alignment and classification. VLF connects all the sub networks and also function as information valve to compromise alignment and classification errors. For a given input image, the part localization sub network outputs the commonly used co-ordinates, top-left and bottom-right bounding box corners. Ground truth bounding boxes are generated with part annotations. This sub-network consists of 5 convolutional layers and 3 fully connected layers. The alignment sub-network receives part localization from localization sub-network.it performs template alignment. This network performs translation, scaling and rotation for pose

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A Survey on Underwater Fish Species Detection and Classification

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Abstract— Fish species recognition is a challenging task for research. Great challenges for fish recognition appear in the special properties of underwater videos and images. Due to the great demand for underwater object recognition, many machine learning and image processing algorithms have been proposed. Deep Learning has achieved a significant results and a huge improvement in visual detection and recognition. This paper mainly reviews some techniques proposed in past years for automatic fish species detection and classification.

Keywords— Fish Recognition;Fish Classification;Feature ExtractionImage Processing;Neural Network;Deep Learning.

I. INTRODUCTION

Live Fish recognition in the open sea is a challenging task. They have been investigated for commercial and environmental applications like fish farming and meteorological monitoring. Traditionally, aquatic experts have employed many tools to examine the appearance and quantities of different types of fish using methods such as casting nets to catch and recognize fish in the ocean, diving to observe underwater, using photography[1], combining net casting with acoustic(sonar)[2].Quantity of collected data is not enough using these methods. They are not well equipped to capture normal fish behaviors. Nowadays, much more convenient tools like hand-held video filming devices, Embedded video cameras are also used to record underwater animals. Fish presence and their habit at different times can also be observed. This equipment has produced large amounts of data and informatics technology like computer vision and pattern recognition are required to analyze and query large about videos. Statistical details about specific oceanic fish species distribution ,besides an aggregate count of aquatic animals can assist biologists resolving issues ranging from food availability to predator-prey relationships. Since fish can move freely and illumination levels change frequently in such environments, the recognition task is challenging. The challenges faced during classification of underwater fish species include noise, distortion, overlap, segmentation error and occlusion. As a result, this task remains an eminent research problem. Prior research is mainly restricted to constrained environments and the datasets were probably small. The accuracy also is very unsatisfying under constraint and unconstraint conditions.Many scientists in the field of ecology collect large amounts of video data to monitor biodiversity in their species applications.But manual analysis of this data is time consuming. However this large scale analysis is important to obtain the knowledge to save ecosystem that have a large impact on the human population. So tools for automatic video analysis need to be developed. In this paper we first discuss about some techniques based on shape, color, texture and hierarchical classification approaches used for fish detection and classification. The last section review about deep learning based techniques.

II. LOW-LEVEL FEATURE BASED APPROACH

Many fish species have similar size, color and shape which makes the identification process very difficult. This section reviews species recognition based on geometric features such as size and shape and appearance features such as color and surface texture.

Fish Contour .This figure is from paper[5]

This paper [3] presents the design of an automated fish species recognition and monitoring system. Several shape-based recognition methods were implemented on the prototype system for testing. Curvature function analysis is used to find critical landmark points on the fish contour. Fourier descriptors of a bend- angle function for shape description meet all invariant requirements. For recognition process, power spectrum and phase angle information is calculated as shape descriptors. Since the performance of these shape methods did not give satisfactory result, a new

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AUTOMATICFETAL HEAD CIRCUMFERENCE MEASUREMENT IN 2D ULTRASOUND FETAL IMAGES USING HISTOGRAM OF ORIENTED GRADIENT

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ABSTRACT

Ultrasound images are used to provide information about fetal development in the womb. The image generated by the two-dimensional ultrasound has not been able to provide complete information. Therefore, in order to get the form of fetus on ultrasound image can be clearly identified with the necessary process of image analysis that can detect the boundaries of objects ROI, so that it can differentiate between one object with another object on the ultrasound image. In this paper, we explore a new local feature extraction technique pyramid histogram of oriented gradients (PHOG) to make simple, fast and high performance. PHOG can describe the local shape of the image and its relationship between the spaces. The using of PHOG algorithm to extract image features in image recognition and retrieval and other aspects have achieved good results.

Keywords: Region of Interest (ROI).Ultrasound (US), histogram of Oriented Gradients (HOG).

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http://www.iaeme.com/IJARET/issues.asp?JType=IJARET&VType=11&IType=12

1. INTRODUCTION

Ultrasound (US) is commonly used for pregnancy diagnosis due to its noninvasive nature, low-cost and real-time acquisition. The main goal of the ultrasound examination is to determine the location of the fetus and the placenta, the number of fetuses, the gestational age

SPECKLE NOISE REDUCTION AND PERFORMANCE EVALUATION OF VARIOUS FILTERS IN 2D ULTRASOUND FETAL IMAGES

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***Abstract*—** Ultrasound is an imaging technique which is noninvasive, nonradioactive and also inexpensive and is used for diagnosis and treatment. Presence of noise in ultrasound fetal images is a major issue as it can lead to improper diagnosis. It is more important to preserve the features of the fetal image by removing the noise. The main objective of image enhancement is to obtain a highly detailed image. The traditional techniques are not very good for especially speckle noise reduction. This paper explains about various kinds of filters that are used for speckle noise reduction. Here we have used some spatial filtering techniques like Gaussian filter, Median filter, bilateral filter, Wiener Filter**,** and Speckle Reducing Anisotropic Diffusion filter to denoise fetal ultrasound image. The performance of these filtering techniques are compared on the basis of Peak Signal to Noise Ratio (PSNR),Root Mean Square Error (RMSE) and Structure Similarity Index (SSIM). The results obtained are presented in the form of statistical tables and diagrams. Based on the statistical measures and visual quality of the US images the Speckle Reducing Anisotropic Diffusion filter (SRAD) performed well over the other filter techniques.

.

Keywords: **ultrasound images, speckle noise, PSNR, RMSE,SSIM.**

I. INTRODUCION

Medical ultrasound images are mostly corrupted by speckle noise in its acquisition and transmission. The poor quality of the ultrasound image is a major drawback in the medical field..The main challenge in the image denoising techniques is to remove such noises while preserving the important features in the image. There are so many techniques have been made to reduce the speckle noise using various types of filters[1]. Many filters have been used to improve the performance, which is assessed based on the quality metrics such as Peak Signal to Noise Ratio(PSNR),Mean Square Error(MSE),Mean Absolute Error(MAE).This paper focuses on speckle noise reduction techniques in fetal ultrasound images using different filtering techniques.

Today, US imaging is one of the most common tool used for diagnosis over the other imaging modalities like Positron emission tomography (PET), Magnetic Resonance imaging (MRI) and Computed tomography (CT) due to its low cost and availability. Speckle noise[4] is the characteristic effect
seen in US images that affects the visual quality, as these are low resolution images which are constructed by using reflection of ultrasound waves. However, speckle noise as shown in Figure 1, is significant in ultrasound images and it might cause negative impact on post-processing steps such as image segmentation and image compression.

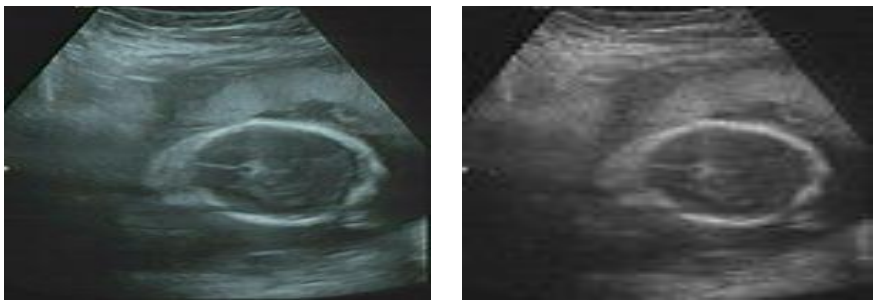

Figure 1. Comparison between Fetal Ultrasound Image with a Fetal Ultrasound Image Degraded by Speckle Noise

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Research Article

Food Calorie Measurement and Classification of Food Images

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ABSTRACT
Food classification, detection and measurement analysis is the subject of inside and out research on food propensities and different applications identified with food appraisal. The exploration network needs pictures in database for evaluation and preparing for the particular subject of kcal quantification with food partitions to solitary and blended prepared foods. The spread of heaviness and obese seems to have been noteworthy overall in recent times but is regarded as being one of the major general medical problems. By watching present situation the analysts have attempt to determine them by presenting a technique like calorie measurement framework. They will maintain the health and function in certain lines by counting the calorie. Use of the invention of organic commodity identification and calorie calculation is exceptionally helpful in disseminating food knowledge and culture among individuals during the time of corpulence caused by harmful behavior of eating habits and a wide variety of incorrect packaged foods. Developers do provide food identification illustrations utilizing graph cut segmentation and a deep learning method.

Keywords: Calorie Measurement, Obesity Management, Image Segmentation, Deep Learning Algorithm.

INTRODUCTION

Food pictures, occupied by people using certain mobile phones, are utilized in many proposed frameworks for food acknowledgment, discovery, and order. Identification of food fixations, about there image is a vital process in kcal classified and described used for treating serious illness, such as kidney disease, circulatory strain, corpulence, etc. In any case, and for specific subject of calorie quantification with food partitions of solitary but also blended food items, the review network is deficient in terms of an independent and accessible picture database, in addition to experimentation and preparation, trying to make additional test correlations across different food recognition strategies. With all that in opinion, we describe a database of 3000 images throughout the whole article, offering different illuminators a range of food presents varies in various cameras.

The spread of the stoutness and overweight has been substantial worldwide in recent times and is regarded another big general health concerns. Accordingly, the World Health Organisation (WHO) has reported that the rate of corpulence across globe have reached one billion; expected rate rise to 2.5 billion by 2019. Corpulence is defined for the most part as both the rising amount of fat molecules in an individual's body[1]. This causes multiple occupational problems, along with various forms like asthma, apnoea rest, is chaemic stroke, coronary heart attack, kidney as well as nerve bladder, and bosom and colon cancer.

To the end, acquiring an accurate database will strengthen the acknowledgement of successful patient treatment facilities. The framework works on cell phones as well as allowing the customer to take a photo of the food and, as a result, to evaluate the caloric intake. This research offers a database for the food image. In addition, it offers instances of food position using division chart cut [4] and deep learning calculations [5]. Today's database can help even more studies on specific kinds of food recognition and studying calculations.

We are likely to present the most well-known food consumption estimation methods developed during the last few years in this segment. The part of this activity and downsides of certain strategies are described, in order to demonstrate the oddity and commitment of the suggested scheme. The 24- Hour Dietary Recall (24HR)[7]-[8] is one of the key therapeutic works here.

In [12], the creators have gathered 101 distinctive cheap food pictures, for example, burgers, pizza, servings of mixed greens, and so forth. In any case, the assortment has just cheap food pictures. The dataset in [13] presents 101 food

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IMPLEMENTATION OF DEEP LEARNING TECHNIQUES TO ADDRESS CORAL REEF DISEASES

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***Abstract*— Coral reefs is an important, unavoidable attribute of the marine ecosystem. It plays a major role in keeping the ecosystem balanced. Coral reefs produces nutrition and proteins to the fishes like tuna, dolphin and other pelagic species. But, due to industrial pollution, human-related activities, climate change, bleaching, the total amount of the coral reefs has drastically reduced. According to the report of Global Coral Reef Monitoring Network (GCRMN) around 19% of coral reefs in the world has lost in last 30years and it is expected to lose another 17% by 2030. It has also predicted that, in 2050, all the coral reefs in the world will be in danger. To address this alarming issue, this research work proposes a deep convolution neural network machine learning technique to identify the infected or diseased corals from videos. Here, two datasets are used. One is used to train the neural network to predict the type of the coral reef downloaded from Mendeley open source archive and second dataset is used to predict whether the particular coral is affected from white plague disease or not. The second video dataset is downloaded from official BBC Earth YouTube web channels in HD 720 pixel. These data are given as input to the Deep Convolution Neural Network (DCNN) to perform image classification. The proposed system automatically predicts the diseases in the coral reefs and helps in improving the coral ecosystem.**

***Keywords*— Deep learning; Coral reefs; Disease prediction; Coral ecosystem; neural networks.**

1. INTRODUCTION

Coral reefs are living, colorful, multi-faceted structure, which are the part of marine ecosystem. Coral reefs are formed by calcium carbonates and are mostly present near equator of the world. It lives in warm water and maintains a temperature between 20 to 28 degree Celsius It creates a colony-like structure to shelter species like fishes, crabs, sea stars, shrimps and algaes [1]. It is estimated that around one lakh different species are living under the coral reefs. It also produces nutrition and proteins to the species that live on the ocean. Moreover, it also helps human being by providing coral foods, shorelines protection and medicines. On the basis of recent report from National Oceanic and Atmospheric Administration, the annual economy earning of coral reef mining is about 30 billion US dollars.

Coral reefs has most variety of all marine ecosystem. There are more than 2500 species of coral reefs in the world. Around 40 percent coral are hard in nature. It will not have any motion or movements in the ocean. They will look like a hard rock. On the other hand, remaining 60 percent of corals are soft in nature [2]. It will have a skeletons that are flexible to make motions on the water. Though, it gives several advantages to the ecosystem and human being, coral reefs are now in great danger due to industry pollution, overfishing, destructive fishing and climate change. In some places on earth, the coral reefs are entirely destroyed and in many places coral reefs are in endangered situation.

Diseases spreading on the coral reefs are also an important reason for the degradation. Diseases like vibrio, white syndrome, white band, and rapid wasting disease. In here, the white syndrome and white band are the wide spread disease in the entire world. These diseases forms a white colored foam in the surfaces of the coral reefs. It also exhibits a pronounced division between the remaining coral tissue and the exposed coral skeleton. White layer diseases such as white band and syndrome in the coral reefs can be categorized into Type I and Type II diseases. In here, Type I, diseases doesn't show any bleaching on the upper layer of the coral reefs. But it changes the color slightly. Type II coral reef diseases bleaches the surface completely[3].

In this research work, we intended to create a framework to identify the corals types and its

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PREDICTION OF LIVER DISEASES USING DECISION TREES AND MACHINE LEARNING ALGORITHMS

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Abstract
Human body consists of various important organs for processing the entire metabolism of the human being. Some of them are the kidneys, brain, heart and liver. The proper functioning of these organs will lead the person happy life. The identification of problems to these organs is also important at the right point of time. In the current article a GUI model had been developed such that to identify the level of damage happened to liver based on the data given by users. The current model will also provide the details about various problems that causes to the liver through GUI model. The saying in the medical field is always predicting the disease in earlier stages is better than at the crucial period such that to reduce the damage of that problem to that particular organ. The symptoms also become more different and also difficult to analyze at later stages. In the current tool, an attempt had been made to utilize the machine learning algorithms like K-means, ANN and SVM to analyze the liver patients from a group of normal patients. The comparison of the machine learning algorithms for their performance to identify the liver problems based on performance factors also observed. The developed GUI can be a good source for the doctors to analyze liver diseases.

Keywords: Liver,Diseases,Machine learning, ANN, SVM, K-means

1. Introduction

Human body had a versatile number of parts which are playing a key role for the healthier life of any human being. Some of those parts are brain, heart, liver, kidneys, etc,. The successful functioning of these parts will lead the life any human being successful and a happy life [Dimitris Lipara et. Al., Kulwinder Kaur et. Al., Pooja Sharma et. Al.,]. The diseases or the problems occurring with these parts may lead to great damage to the functioning of the human body. The major problem concerned with these components was all these parts working metabolism depends on the functioning of other parts of the body. The identification of problems with these parts and diagnosis at the right intervals at right point of time is more important such that the further damage of the parts and the problem spreading to other parts also can be reduced to some level. When the diseases to these organs are in severe conditions, the symptoms are apparently changes from the regular types of symptoms and it becomes difficult to identify when the diseases are in critical stages. With proper medication and other measures taken by the patients, these problems can be reduced to some level of damage to the other parts of the body. The currently developed application is a graphical user interfacing unit with which the doctors or medical practitioners can utilize to identify the symptoms and give as input and can identify the problems of liver diseases at various stages [Hao Jia, Manmohan Shukla et. Al., V.V.Ramalingam et. Al.,].

The current model is also used to identify the number of people with liver problems also identified from the available list of patients. A group of patients and their blood samples and values are made with databases and the data was given as input to the current model and list of patients with liver problems are identified from the available list of total patients in the selected database.

About Liver

Liver is one of the important organs in the human body [G.Ignisha Rajitha et. Al., Esraa Mamdohi Mai et. Al., Islam MM et. Al., Mei Ying et. Al.,]. The size of the liver is large and its place in the human body is on the right side of the belly of the human being. The colour of the liver is red and brown in colour. It always looks like the feel of a rubber type of material to touch. The tasks performed by the liver in the human body are around 500 tasks [Abhijit singh Putu et. Al., MoonSun Shin et. Al., Jung-euk Ahn et. Al.,]. The best feature of this organ is that it can regenerate at any

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DEEP CONVOLUTIONAL NETWORKS FOR UNDERWATER FISH LOCALIZATION AND SPECIES CLASSIFICATION

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ABSTRACT

Live fish recognition is a difficult multi-class order task in the open sea. We propose a technique to perceive fish in an unlimited common habitat.In the proposed technique, VGG-16 with deep fish architecture is used to enhance the feature extraction what's more, to improve the exactness of the result.The proposed approach comprises of two fundamental stages; namely Fish Localization phase and Fish classification phase.The technique first detect the fish from the image by extracting feature map using VGG16 network. DeepFish architectureis used to categorize the Fish.Then, the proposed approach uses support vector machine and random forest classifier to differentiate between fish species. Experimental results obtained show that VGG16 with deepfish architecture using support vector machine attains a better accuracy of 99.47%.

Keywords: VGG-16, Random Forest, Support Vector Machine, Deep Fish Architecture

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1. INTRODUCTION

Recognition investigates are for the most part centered around objects on the ground. In any case, Recognition of submerged article is in incredible interest. Fish Recognitions a difficult exploration issue. We attempt to find an answer for submerged item Recognition. We propose a structure for submerged live fish Recognition in unhindered normal air. As fish can move uninhibitedly and brightening levels change much of the time in such atmosphere, theRecognition task is very challenging. So the undertaking of fish Recognition stays an

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Efficient HAAR Wavelet Transform with Embedded Zerotrees of Wavelet Compression for Color Images

S. Piramu Kailasam

***Abstract*—**This study is expected to compress true color image with compression algorithms in color spaces to provide high compression rates. The need of high compression ratio is to improve storage space. Alternative aim is to rank compression algorithms in a suitable color space. The dataset is sequence of true color images with size 128 x 128. HAAR Wavelet is one of the famous wavelet transforms, has great potential and maintains image quality of color images. HAAR wavelet Transform using Set Partitioning in Hierarchical Trees (SPIHT) algorithm with different color spaces framework is applied to compress sequence of images with angles. Embedded Zerotrees of Wavelet (EZW) is a powerful standard method to sequence data. Hence the proposed compression frame work of HAAR wavelet, xyz color space, morphological gradient and applied image with EZW compression, obtained improvement to other methods, in terms of Compression Ratio, Mean Square Error, Peak Signal Noise Ratio and Bits Per Pixel quality measures.

***Keywords*—**Color Spaces, HAAR Wavelet, Morphological Gradient, Embedded Zerotrees Wavelet Compression.

I. Introduction

RECENT techniques in the discipline of image analysis resulted large amount of images in each time. Processed image or video takes large storage area during the time of download or upload. Similarly, the storage and transmission of statistics is big hassle and there is a necessity to take essential steps. As stated by way of Parkirson's first law [13], as the necessity of storage increases, transmission capacity twice will increase. Though it is far boom in rate, the storage capacity is good than the technology. Data compression deals with morse code later hired in the famous Huffman code. In order to overcome this challenge, data compression [17] has been presented to compress the size of data being stored or transmitted. Eliminating redundancies is subsequent state of artwork method to symbolize information in binary form. The velocity of moving records rate in WIFI is becoming important these days because of thousands and thousands of users in social media. The storage and computation speed are not in direct percentage. Like sparse matrix, the redundant records are compressed by suitable compression algorithms like EZW, SPIHT, Spatial Orientation Tree Wavelet (STW), Wavelet Difference Reduction (WDR), Adaptively Scanned Wavelet Difference Reduction (ASWDR) and SPIHT 3-D.

II. Related Works

In this section existing papers applied inside the discipline of image compression are explained elegantly. The wavelet remodel [5] has important role with image compression. The wavelet is outstanding than Discrete Cosine Transform (DCT) [10]. Similarly, wavelet based compression is best in interpreting mistakes and transmission of images because of the purpose of high resolution nature [7] and degradation tolerance. In [1], the Huber–Markov random field model with objective artifact achieved good Bits per pixel (BPP) and PSNR.

Alzahir and Borici [4] compress discrete color images used the method codebook row column reduction coding in comparison with maps and binary images.

Babu et al. [2] overcome the drawback of Run Length Coding (RLC) with matrix based on mapped-pair approach. In addition, the author analysed the performance metric of compressed images .tiff, .jpg, .gif and text documents by RMSE, SNR, PSNR and CR. The robustness and compression efficiency [9] is performed in lossless compression [2] technique for color images and raster images. Consequently, DCT area has been introduced in most video compression techniques [2]. The overall performance of DCT degrades in high compression ratio [14]. Moreover, many researchers substantially target Discrete wavelet transform (DWT). DWT [14] is appropriate for human visible gadget for purpose of adaptive spatial frequency. At the same time, another compression algorithm, Embedded zerotree, does no longer need preknowledge of image. EZW is good enough in encoding and accuracy rate for true color images.

In embedded image coding, the usage of zerotree of wavelet coefficient (EZW) using stream of bits [6] is an efficient lossy compression image technique. Larger coefficients of EZW are the prime factors than smaller coefficients regardless of their scale [16]. An embedded code is produced in the order of importance. It defines a string of binary selections. In EZW, encoding and decoding may be ended when the goal is reached. EZW [17] is the basic method for tree shape approach and it is an effective embedded image compression that generates bit circulation. Ultimately SPIHT [11] is refinement to EZW and it uses the principle of operation. Evaluation of EZW, SPIHT is high in terms of compression parameter [12]. In alternative, SPIHT coding operates in exclusive scales on the equal spatial vicinity within the wavelet subbands. This yields embedded bits with less MSE. Similarly, SPIHT can be useful to lossless algorithm [15].

Jamel [21] pointed that SPIHT algorithm is simple computation approach. The work in SPIHT algorithm [18] suggests that the execution time is reduced when compression ratio value is elevated. DWT-SPIHT is good in quality with high PSNR. The wavelet based contourlet transform (WBCT)

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Pixel level Image Fusion using Wavelet decomposition technique in Color Images

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Pixel level Image Fusion using Wavelet decomposition technique in Color Images

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Abstract Color Image Fusion is the design method to improve the image substance by fusing images. The aim of the image fusion is to fuse more useful information and remove the outliers from registered images. Pixel level Wavelet Image fusion method is suitable for color images of equal in size as well as resolution in visual perspective. Quantitative analysis is done using RMSE and entropy, DFE, SSE and R-square measurements. The analysis report obtained from various image file types give better result for inverse discrete wavelet transform applied image fusion method.

Keywords Image Fusion · Pixel level Image Fusion · Color Images · Wavelet Image Fusion · Resolution

1 Introduction

The use of colour in image processing is given by two principal factors. First the color is an effective descriptor which is often identify the objects. Secondly, the manual analysis made by human beings. The colour image processing is classified into two major areas full color and pseudo colour processing. The result of full color image processing are now used in visualization and internet. Digital color image processing is done in pseudo color level. Colour Image fusion is especially useful in security level in authendicated communication via fast network services. In defence section, the send images hide with encoded colours in Lab , YCMk color model. This will be retrieved by applying certain algorithms in terms of DWT technique. The probability of interception get by inversing number of images to be fused and the total possibility of combinations of fused images[7] over input images is NC_r.

Here N is number of images and r is required images for combination.

The important thing is both the input images should be in same size and resolution. In color image fusion the image splitted in to R, G, B colors calculated in bravery color normalized technique by

$$R_{new}=R/(R+G+B) \times Pan1 \quad (1)$$

$$G_{new}=G/(R+G+B) \times Pan2 \quad (2)$$

$$B_{new}=B/(R+G+B) \times Pan3 \quad (3)$$

R-Red G-Green B-Blue Pan – Pan image

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Prediction of Tuberculosis Diagnosis Using Weighted KNN Classifier

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Abstract

In this paper, a Machine learning Model is used to develop predictive model for Tuberculosis diagnosis using classifiers. The Model is developed with Principle Component Analysis for feature extraction and classified with Ensemble KNN Classifiers. The data is transferred into the knowledge that the symptoms are the significant ones in diagnosis Tuberculosis. The presented results showed that Ensemble KNN classification accuracy for TB diagnosis is 91.4 % and training time is 1.4661s, also analyzed with True positive rate and False positive rate.

Keywords: Tuberculosis, Principle Component Analysis, Machine learning classifiers, Classification

1.Introduction

The Tuberculosis Chemotherapy Centre (as the NIRT was then known) was set up in 1956 as a result of collaboration between ICMR (Indian Council of Medical Research), BMRC (British Medical Research Council), USPHS (United States Public Health Service), and the government of Tamil Nadu. It became the Tuberculosis Research Centre (TRC) in the 1970s, and was renamed the National Institute for Research in Tuberculosis (NIRT) recently. NIRT's vision is to undertake high quality research in Tuberculosis that is relevant to both national and global programmatic needs.

The first research activity undertaken in 1956 ('The Madras Study') was meant to compare the efficacy of drug treatment at home, for isolation in sanatoria during the treatment duration for TB patients. The study found that cure rates were the same in both settings, and there was no greater contact risk by leaving patients at home. The results of this trial prompted OPD treatment of TB patients.

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Fetal ultrasound image segmentation using dilated multi-scale-LinkNet

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***Abstract*---**Ultrasound imaging is routinely conducted for prenatal care in many countries to determine the health of the fetus, the pregnancy's progress, as well as the baby's due date. The intrinsic property of fetal images during different stages of pregnancy creates difficulty in automatic extraction of fetal head from ultrasound image data. The proposed work develops a deep learning model called Dilated Multi-scale-LinkNet for segmenting fetal skulls automatically from two dimensional ultrasound image data. The network is modeled to work with Link-Net since it offers better interpretation in biomedicine applications. Convolutional layers with dilations are added following the encoders. The Dilated convolution is used to expand the size of an image to prevent data loss. Training and evaluating the model is done using the HC18 grand challenge dataset. It contains 2D ultrasound images at different pregnancy stages. The results of experiments performed on an ultrasound images of women in different pregnancy stages. It reveals that we achieved 94.82% Dice score, 1.9 mm ADF, 0.72 DF and 2.02 HD when segmenting the fetal skull. Employing Dilated Multi-Scale-LinkNet improves the accuracy as well as all the evaluation parameters of the segmentation compared with the existing methods.

***Keywords*---**Fetal ultrasound image segmentation, Deep learning, Dilated convolution, Encoder-decoder, Link-Net.

Introduction

Ultrasound is a useful tool to monitor fetus and mother during pregnancy due to its non-invasiveness and less expenses for imaging while

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Green Synthesis And Characterization Of Nickel Oxide Nanoparticles

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Abstract

An Contemporary affirm of explore on the green synthesis of metal oxide nanoparticles and their improvement over chemical synthesis routine. In this method, non-hazardous safe reagents that are eco-friendly and biosafe are used. Consequently, an attempt is to prepare the Nickel Oxide (NiO) nanoparticles via Chemical and Green synthesis method. To Synthesize the pure NiO and GS-NiO nanoparticle with reducing agent of Plectranthus Amboinicus leaf extract used and calcinated at 400^{o}C in a controlled manner. To study the phase nature, functional groups and Optical energy band gap of the synthesized pure NiO and GS-NiO nano particles by using XRD, FT-IR and DRS-UV.

Keywords: *NiO, Plectranthus Amboinicus leaf, XRD, FTIR, UV-DRS, SEM-EDAX.*

1.1 Introduction

A facile way of Green synthesis is a promising area in the pasture of nanoworld and provides economic and environmental benefits. Know-how to be in command of crystallization is an essential constraint for the synthesis, purification, and application of materials in various industrial fields. In particular, Nickel oxide (NiO) is one of the the majority expensive resources

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A Novel Image Processing Approach for Measuring Energy Intake and Nutrition from Food Image

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ABSTRACT

Food recognition is a key component in measuring every day food intakes and it is challenge due to intra class variation. A system that can measure calories and nutrition in every day meals can be very useful. In this paper, we propose a Food Intake and Nutrition Measurement System that can help diabetic patients. To identify food items accurately in such systems, image processing is used. Image processing techniques like image segmentation, feature extraction, object recognition, classification is used for food recognition, nutrients identification and calorie calculation. Bag-of-Features model, Artificial Neural Networks is used to identify the food items. Image classifiers are trained to identify and categorize individual food items in single image.

Keywords: Food recognition; Segmentation; Classification

1. Introduction

One of the major goal of food image processing is to retrieve calorie and nutrient information from the given food image. Food recognition is worthy of more research effort owning to its practical signification and scientific challenges. Food recognition exposes new challenges to the current pattern recognition literature and stimulates the stemming of novel techniques for general object recognition. In addition, automatic food recognition is beneficial to health care related applications, such as obesity management.

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Obesity has become a serious public health problem to general population in many developed countries [1], [2].The WHO defines obesity based on the Body Mass Index (BMI) of the individual. A person is considered obese

Fetal Ultrasound Image Segmentation for Measuring Head Circumference Using Enhanced U-Net Architecture

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Abstract— Automatic segmentation of fetal biometrics like head circumference in the 2D ultrasound images are used to monitor growth and evaluate the gestational age. Manual methods are known to be time consuming and not accurate, hence there have been numerous researches on automated methods. Frequent scanning of fetal results in clinical disturbances to the fetal growth and therefore the quantitative interpretation of Ultrasonic images also a difficult task compared to other image modalities .To overcome these difficulties, we propose a deep-learning-based methodology named U-Net that greatly enhances deep neural networks capability of segmenting the ultrasound image. The quality of image in terms of brightness and contrast are improved using image enhancement techniques based on Speckle Reducing Anisotropic Diffusion (SRAD) Filter to denoise the image. This model takes the specified features from the ultrasound images and performs segmentation and acquires the fetal head circumference with higher accuracy and reliability.

Keywords— ***Keywords: Ultrasound image , Fetal Head Circumference,(FHC) Deep Learning Neural Network, U-NET Architecture***

I. INTRODUCTION

Ultrasound (US) imaging may be a safe non-invasive procedure for diagnosing internal body organs. Ultrasound imaging as compared to other imaging tools, like computerized tomography (CT) and resonance imaging (MRI), is cheaper, portable and more prevalent [1]. Ultrasound imaging has became a general checkup method for diagnostic procedure . It is used to investigate and measure fetal biometric parameters, like the baby's abdominal circumference, head circumference, biparietal diameter, femur and humerus length, and crown-rump length. Furthermore, the fetal head circumference (HC) is measured for estimating the gestational age, size and weight, growth monitoring and detecting fetus abnormalities [2]. Ultrasound imaging is the most preferred tool for medical monitoring, follow up and diagnosis owing to its low cost and reliability. However, ultrasound images suffer from a variety o f drawbacks including acoustic shadow, motion blurring, and low signal-to-noise , making the identification of ordinary planes a challenging task for sonographers. This makes the US images very challenging to interpret, which needs expert operators. As shown in US image samples of Fig. 1(a) these images are noisy and blurry with incomplete shapes; furthermore, the fetal skull is not visible enough to detect in the first trimester.

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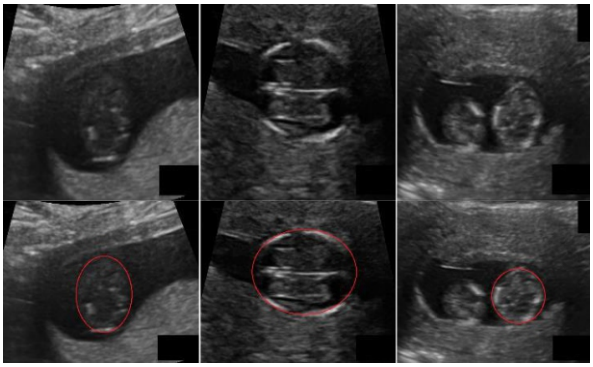

Figure 1. Samples of ultrasound fetal head dataset1 a) Original images b) Ground truth provided by a radiologist (red borders).

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II. RELATED WORK

In the last decade, automatic methods for fetal biometric measurements are investigated. Development of these automated methods has improved the work flow efficiency by reducing the examination time and number of steps necessary for standard fetal measurements. Generally, deep learning is that the most opted approach within the field of medical imaging. In the last decade, there has been a lot of automated methods that were adapted to estimate the fetal biometrics. Development and intense research of these automated methods has improved the workflow efficiency by reducing time constraints [3]. Past studies have used various methods for HC measurement like randomized Hough transform [4], semi supervised patch based graphs[5], multilevel thresholding circular shortest paths [6], boundary fragment models[7], Haar-Like features [8], active contouring [9], or compound methods like [10] which apply Haar-like features to coach a random forest classifier so as to locate the fetal skull. Then, Head Circumference (HC) was extracted by using Hough transform, dynamic programming and ellipse fitting[16]. Although these methods provided inaccurate results, they were assessed on small datasets of particular pregnancy trimesters. Recently, deep convolutional neural networks (DCNN) have rapidly become a compelling choice for several image processing tasks such as classification, object detection, segmentation, and registration. More recent researches on fetal ultrasound image analysis specialize in using DCNN. Another research

TB Diagnosis Using Machine Learning Classifiers

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Abstract:-

This study attempts to model a classification problem to examine the machine learning approach for medical diagnosis by different classifiers. To get detailed analysis in terms of accuracy, the machine learning approach is used. The model is illustrated using tuberculosis patient‘s minimum level features to find the problem of TB disease diagnosis. In this paper, a Neural Network Model for classification of medical data set and is used to develop predictive model for classification. The Model is developed with PCA for feature selection and classified with Ensemble KNN Classifiers. The data is transferred into the knowledge that the symptoms are the significant ones in diagnosis Tuberculosis. The presented results showed that Ensemble KNN classification accuracy for TB diagnosis is 90.2 % and training time is 1.4661s, also analyzed with ROC curve method.

Keywords:-

Tuberculosis, Neural Network, Machine learning classifiers, Classification

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Image Denoising Techniques Based on Threshold Wavelet Transform for 2D Ultrasound Fetal Image

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Abstract:-

Ultrasound imaging is a good examination mechanism during pregnancy that can be used for measuring specific biometric parameters towards prenatal diagnosis and estimating gestational age. In medical image processing the images acquired are usually affected from various noise such as gaussian noise, salt and pepper noise, speckle noise, periodic noise etc. Therefore, acquisition of images without noise is nearly a difficult task. Various filtering techniques are used to reduce the noise for further analysis of medical images. In this paper, the quality of image in terms of brightness and contrast are improved using image enhancement techniques based on new wavelet threshold method to denoise the image..The quality of image in terms of brightness and contrast are improved using image enhancement techniques based on new wavelet threshold method to denoise the image.

Keywords:-

Ultrasound image, image denoising, threshold, wavelet transform

Automatic Segmentation of Fish Using Segnet-Architecture

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Abstract:-

Recent find outs in the computer vision community have led to the development of efficient deep learning techniques for end-to-end segmentation of underwater images. .Due to the result of global climate changes to marine biology and aquaculture, researchers start to look into the deep ocean environment and living circumstances of rare fish species. Segmentation of color fish images with a complex background in water considered a big challenge. Different species of fishes have various texture, color and shape features in their body parts (head, abdomen, and tail). Formerly most of the work, in fish image domain has been done using global features. This work claims that fish image retrieval system using local features can produce better results as compared to global features. This is because of the fact that fish image has dissimilar features in its body parts. In this research, a Seg-Net architecture is proposed to extract fish object from its background and then separate fish object into three distinguished body parts, i.e. head, abdomen, and tail.The results revealed that the Seg-Net architecture has achieved an accuracy of 87.5% on fish image segmentation and demonstrated the effectiveness of local features over global features.

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CNN Based Food Identification and Calorie Measurement from Food Image

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Abstract:-

The ease with which food is being delivered at our doorsteps has lead to an outbreak of a major chronic disease known as obesity. As the necessity of the food arose among people, the apprehension related to their diet also simultaneously increased. In this paper we propose a calorie measurement system whereby the user is made to upload the image of food item and as a result, number of calories present in the uploaded food image will be predicted. It is a multi-task system which also displays the weekly statistics on how much calorie is consumed by the user and how more/less calories must be consumed to avoid obesity related diseases such as heart attack, cancer etc. We built a dataset of food images collected from existing datasets to detect complex images consisting of 20 classes and each class containing 500 images each. We have curated our own Convolutional Neural Network architecture of 6 layers to extract the features and classify the images. Our experimental results on food recognition showed 78.7% testing accuracy with 93.29% training accuracy.

Keywords:-

ECE015 - A flavour of Effective SPIHT, SPIHT 3D, LVL-MMC Compressions on Non-sequential Gray Scale Images

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Assistant Professor, Sadakathullah Appa College, Tirunelveli

A b s t r a c t

This study is aimed to compress color image using SPIHT and LVL-MMC compression methods in color spaces to get good compression ratio. The need of high compression ratio is to increase storage space and speed. The HAAR Wavelet transform is one of the famous wavelet transforms, which maintains image quality. LVL-MMC compression is a sophisticated true compression method which combine wavelet decomposition and quantization using subband thresholding of coefficients and Huffman encoding. In this paper HAAR wavelet Transform using SPIHT and LVL-MMC compression methods are compared with different color spaces. This framework is applied to compress color images. Hence the proposed compression frame work of HAAR wavelet, morphological eroded SPIHT compression gave improvement than other methods in terms of Compression Ratio, Mean Square Error, Peak Signal Noise Ratio and Bits Per Pixel quality measures.

Keywords— Color Spaces, HAAR Wavelet, Morphological Gradient, Embedded ZeroTrees Wavelet Compression, LVL-MMC

INTRODUCTION

Social Media mesmerizes the world people in sharing data, images or videos. Sametime, maintaining these files in desktop or mobile is a daily routine, which is tedious task for nontechnical people. Another hand, online uploading or downloading data and maintenance is also big work to student or teacher. Alternate way of maintaining these data, image or video can be done by compression techniques. Image compression takes important role in image processing domain. Particularly, in internet when sharing the image from device to device or person to person, it is not possible to do without compression. If the data like text, binary, image, graphics, sound or video effectively compressed then significant improvements in data throughput can be reached. Reducing the amount of data in digital image or medical image is done by removing the redundant data, without loss of information in transmission period. Hence, storage, transmission, faster computation are the main goals of Image compression. The storage and computation speed are not in directly proportional. The redundant data are compressed by suitable compression algorithms like EZW, SPIHT, STW, WDR, ASWDR, SPIHT 3-D, LVL-MMC.

RELATED WORKS

In this section existing papers of image compression are explained in detail. The wavelet remodel [5] is applied to all type of images in common. Wavelet is excellent than Discrete Cosine Transform (DCT) [10]. Similarly, wavelet based compression is best in interpreting and transmission of images for multiresolution nature and degradation tolerance. Luo et al (1996),pointed the Huber–markov random field model in DCT gained better Bpp.

It can be observed that Run Length Coding (RLC) with matrix based totally mapped pair approach is best compression for texts. The performance of RMSE, SNR, PSNR, CR ,Compressed file size has been achieved with tiff, gif, jpeg and textual documents. Khan et al (2016) has performed robustness and compression efficiency in lossless compression [2] technique for color images, EEG information and raster pictures.

Ultimately DCT has been introduced in most video compressions [2]. Moreover, many researchers substantially targeting Discrete wavelet transform (DWT) which is appropriate for human visible gadgets with adaptive spatial frequency. In the same time the another compression algorithm Embedded zero tree does no longer need preknowledge of image. It encoding the data at any location also good in accuracy rate for color images.

Embedded image coding , the usage of zero tree of wavelet coefficient (EZW) is an efficient lossy compression image technique for multimedia devices. Here the technique of transformation most of the coefficients are near zero. An embedded code is produced in the order of importance. It defines a string of binary selections. EZW [17] is the basic method for tree shape approach and it is an effective embedded image compression which generates bit circulation. SPIHT [11] is refinement to EZW and it uses the principle of operation. Compare to EZW, SPIHT is higher in terms of compression parameter [12]. This yields an embedded bits with less MSE. Similarly, SPIHT can be useful to lossless compression [15]. Lossless is a reversible process and no information is lost.

The LZW and Huffman image compression strategies are helped to broaden hybrid compression [1] in clinical images. Concatenation of LZW code words and Huffman coding detection techniques are implemented to get size reduction, high compression ratio and high signal noise ratio.

SPIHT algorithm (Set Partitioning into Hierarchical Trees) is a powerful wavelet based image compression algorithm, here tree structure chosen to represent the transformed image which identified by the coefficients for each node. J. Udhaya Kumar ,T. Vengattaraman, P. Dhavachelvan are, pointed that Runlength Encoding employs high reduntant data in loss less compression. Pearlman pointed that SPIHT method is efficient for wavelet image compression [3]. SPHIT uses arithmetic coding to improve image quality. SPIHT has become benchmark algorithm. It is one of the highest wavelet based coding algorithm. 3D SPIHT coding is a excellent technique to color image compression than conventional methods such as EZW, SPIHT always generate local optimal values. 3D SPIHT [11], [19] is the modern octal tree technique for 3-dimensional true color image compression. In this study 3D SPIHT with different color conversion methods are applied to different types of images. SPHIT algorithm applied to nonsequence of images. It is experimented with gray scale images.

The LZW and Run length Encoding compression methods are excellent to png files. Specially LZW is suitable for textual content files. Another technique LVL-MMC could be very appropriate for subband thresholding of coefficients and Huffman Encoding. One of the most important paper on

CSE022- A Review of Supervised Learning Image Classification Algorithms

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A b s t r a c t

Object recognition is a method in the computer vision to identify and recognize objects in the picture or video. When humans see photos or watch videos, they can quickly recognize some object like a car, bus, human, cat, food, and other visual artifacts. However, how do we apply it to the computer? *Classification* is the technique or method in *object recognition* that can be used on a computer to distinguish one object from another object contained in the image or video. In this paper, the author proposes about testing some popular image binary classification algorithms used along with the results of the performance matrix of each algorithm, among these are *Logistic Regression with Perceptron*, *Multi-Layer Perceptron (MLP)*, *Deep Multi-Layer Perceptron*, and *Convolutional Neural Network (ConvNet)*. The author uses the Food-5K dataset to distinguish two classes of objects, namely food / non-food, and then try to train and test how accurate the computer is in recognizing food and non-food objects, where it will be useful to anyone who needs to identify a food object using auto recognizing tools. This paper is expected to contribute in the field of computer vision related algorithm that is used to solve the problem in image classification, with the state of optimal *hyperparameter* and validation accuracy level above 90%. From the test results obtained the level of testing accuracy using *ConvNet* reached above 90% and loss function less than 25% while indicating that *ConvNet* has a significant advantage on the *image classification* problem compared to the generic *artificial neural network*.

Keywords: object classification; deep learning; image recognition; machine learning; convolutional neural network

1. INTRODUCTION

Supervised learning is a *machine learning technique* which is we can associate between inputs and *ground truth* in a dataset. In this technique, it aims to test the truth of *hypothesis* or in other words is to construct a compact model of the *class label* distribution used in defining the *class label* on the test data where the prediction features are known, and the label value of the class is unknown (SB Kotsiantis, 2007). In *supervised learning*, we found two types of problems that can we resolve, which are *regression* and *classification*. In general, the process performed on *supervised learning* is shown in Fig. 1. below.

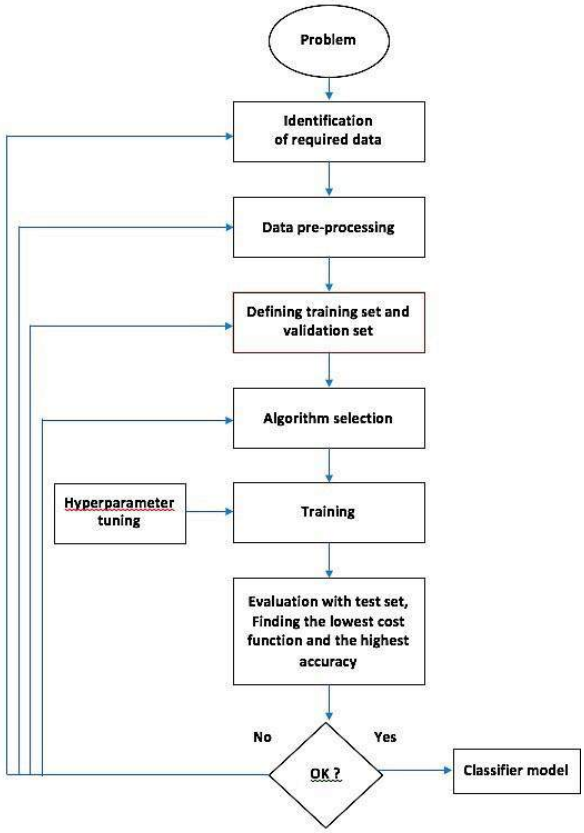

Fig. 1. Flow process of *supervised learning*

Image classification has many roles in some areas, such as an automatic vehicle or pedestrian detection to calculate vehicle density, pedestrian, autonomous self-driving car, and others, which is this attracts a lot of academic and scientist attention to make computers fast and accurate in recognizing an object. (Lee J.D, 1996) has used *optimal linear feature*

CSE019 - Approach of Weight Regularisation using Sparse Autoencoder

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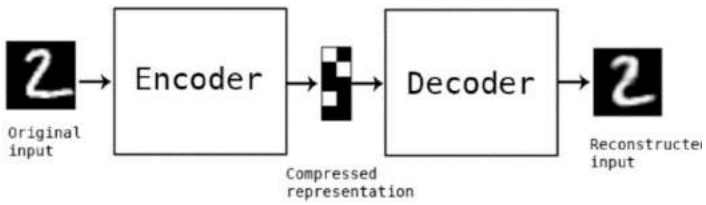
A b s t r a c t

The idea of sparse autoencoders is to impose a constraint on the network such that the representation has the required sparsity characteristics while reconstructing the input at the output layer. In this paper, we proposed sparse autoencoder using L1 of regularisation for weights in feature extraction. It will make the weight value to be zero so there will be no updation further. So sparse autoencoder actually learns better representation than the original autoencoder. When applied to the MNIST, CIFAR-10, the results show that the proposed model guarantees a sparse representation for each input data which leads to better classification results.

I. INTRODUCTION

"Autoencoding" is a data compression algorithm where the compression and decompression functions are data-specific, lossy, and learned automatically from examples rather than engineered by a human. Additionally, in almost all contexts where the term "autoencoder" is used, the compression and decompression functions are implemented with neural networks. Autoencoders are data-specific, which means that they will only be able to compress data similar to what they have been trained on. This is different from, say, the MPEG-2 Audio Layer III (MP3) compression algorithm, which only holds assumptions about "sound" in general, but not about specific types of sounds. An autoencoder trained on pictures of faces would do a rather poor job of compressing pictures of trees, because the features it would learn would be face-specific. Autoencoders are lossy, which means that the decompressed outputs will be degraded compared to the original inputs (similar to MP3 or JPEG compression). This differs from lossless arithmetic compression.Autoencoders are learned automatically from data examples, which is a useful property: it means that it is easy to train specialized instances of the algorithm that will perform well on a specific type of input. It doesn't require any new engineering, just appropriate training data.

To build an autoencoder, you need three things: an encoding function, a decoding function, and a distance function between the amount of information loss between the compressed representation of the data and the decompressed representation (i.e. a "loss" function). The encoder and decoder will be chosen to be parametric functions (typically neural networks), and to be differentiable with respect to the distance function, so the parameters of the encoding/decoding functions can be optimize to minimize the reconstruction loss, using Stochastic Gradient Descent.



II.TYPES OF AUTOENCODER

- a simple autoencoder based on a fully-connected layer
- a sparse autoencoder
- a deep fully-connected autoencoder
- a deep convolutional autoencoder
- an image denoising model
- a sequence-to-sequence autoencoder
- a variational autoencoder

A.Sparse autoencoder

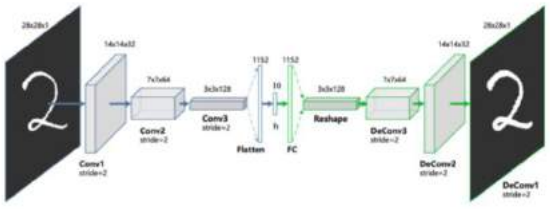
Sparse autoencoders are typically used to learn features for another task such as classification. An autoencoder that has been regularized to be sparse must respond to unique statistical features of the dataset it has been trained on, rather than simply acting as an identity function. In this way, training to perform the copying task with a sparsity penalty can yield a model that has learned useful features as a byproduct.Another way we can constraint the reconstruction of autoencoder is to impose a constraint in its loss. We could, for example, add a reguralization term in the loss function. Doing this will make our autoencoder learn sparse representation of data.

B.Denoising autoencoder

Rather than adding a penalty to the loss function, we can obtain an autoencoder that learns something useful by changing the reconstruction error term of the loss function. This can be done by adding some noise of the input image and make the autoencoder learn to remove it. By this means, the encoder will extract the most important features and learn a robuster representation of the data.

C.Convolutional Autoencoder

Convolutional Autoencoders(CAE) learn to encode the input in a set of simple signals and then reconstruct the input from them. In addition, we can modify the geometry or generate the reflectance of the image by using CAE. In this type of autoencoder, encoder layers are known as convolution layers and decoder layers are also called deconvolution layers. The deconvolution side is also known as upsampling or transpose convolution.



D.Variational Autoencoders

This type of autoencoder can generate new images just like GANs. Variational autoencoder models tend to make strong assumptions related to the distribution of latent variables. They use a variational approach for latent representation learning, which results in an additional loss component and a specific estimator for the training algorithm

CSE001 - Deep Learning Strategies for 2D Ultrasound Foetal Image Segmentation

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A b s t r a c t

Ultrasound is one of the most ubiquitous imaging modalities in clinical practice. It is cheap, does not require ionizing radiation, making it the most commonly used imaging technique in pregnancy. Despite these advantages, it also has some disadvantages such as low imaging quality, low contrast, and high variability. Because of these constraints, automating the interpretation of ultrasound images is challenging. Recently, deep learning has emerged, achieving state-of-the-art performance in various research fields, notably medical image analysis involving classification, segmentation, object detection, and tracking tasks. In this review, we present an overview of segmentation methods in deep learning applied to ultrasound in pregnancy, introducing their architectures and analysing strategies. Finally, we discuss the challenges and limitations with current deep learning-based approaches and suggest potential directions for future research.

Keywords: artificial intelligence, deep learning, neural networks, ultrasound image segmentation

1. Introduction

Medical Imaging is an essential part of today's healthcare system for performing non-invasive diagnostic procedures. It involves creation of visual and functional representations of the interior of the human body and organs for clinical analysis. Ultrasound (US) imaging is a safe non-invasive procedure for diagnosing internal body organs. Ultrasound imaging as compared to other imaging tools, such as computed tomography (CT) and magnetic resonance imaging (MRI), is cheaper, portable and more prevalent [1]. Ultrasound imaging has turned into a general check-up method for prenatal diagnosis. It is used to investigate and measure foetal biometric parameters, such as the baby's abdominal circumference, head circumference, biparietal diameter, femur and humerus length, and crown-rump length. Furthermore, the foetal head circumference (HC) is measured for estimating the gestational age, size and weight, growth monitoring and detecting foetus abnormalities [2,18]. Ultrasound imaging is the most preferred tool for medical monitoring, follow up and diagnosis owing to its low cost and reliability. However, ultrasound images suffer from a range of drawbacks including acoustic shadow, motion blurring, and low signal-to-noise ratio, making the identification of standard planes a challenging task for sonographers. This makes the US images very challenging to interpret, which requires expert operators. As shown in US image samples of Fig. 1(a) these images are noisy and blurry with incomplete shapes; furthermore, the foetal skull is not visible enough to detect in the first trimester.

Fig 1. Samples of ultrasound foetal head dataset[1]

a) Original images b) Ground truth provided by a radiologist (red borders).

Recently, deep convolutional neural networks (DCNN) have rapidly become a compelling choice for several image processing tasks such as classification, object detection, segmentation, and registration [11].In this paper, we provide an overview of state-of-the-art deep learning techniques for 2D ultrasound foetal image segmentation To our knowledge, there have been several review papers that presented overviews about applications of DL-based methods for general medical image However, none of them has provided a systematic overview focused on 2D ultrasound image segmentation applications. This review paper aims at providing a comprehensive overview from the debut to the state-of-the-art of deep learning algorithms, focusing on a variety of 2D ultrasound image segmentation.

Deep learning Architectures

Image segmentation is a key topic in image processing and computer vision with applications such as scene understanding, medical image analysis, robotic perception, video surveillance, augmented reality, and image compression, among many others. DLC can process raw image directly which means, there should be no need for pre-processing, segmentation and feature extraction(fig2). However, most deep learning approaches require image resizing due to the limit on input values. While some techniques do require intensity normalization and contrast enhancement which may be avoided if data augmentation techniques discussed later are employed during training. Resultantly, DLC has higher classification accuracy as it can avoid errors associated with erroneous feature vector or imprecise segmentation. Various algorithms for image segmentation have been developed in the literature [13]. Recently, due to the success of deep learning models in a wide range of vision applications, there has been a substantial amount of works aimed at developing image segmentation approaches using deep learning models. [16]

International Conference on Advances in Science and Engineering (ICASE - 2022)

Thoothukudi, Tamil Nadu, 24th and 25th March, 2022

Semantic Segmentation of Fetal Head in 2D Ultrasound Fetal image using ResLink-Net

W.Fathima Farsana, Research Scholar, Research Department of Computer Science and Applications, Vivekanandha College of Arts and Sciences for Women, Elayampalayam.Periyar University,Salem. Email Id: **afsheensyed84@gmail.com**

Dr.N.Kowsalya, Assistant Professor, Department of Computer Science, Sri Vijay Vidyalaya College of Arts and Science , Nalampalli ,Dharmapuri

Abstract:-

Ultrasound imaging has become one of the standard examinations during pregnancy.Accurate segmentation of fetal ultrasound images can help physicians measure HC efficiently and accurately and make further analysis. It is a challenging task due to the poor image quality. In this study, we propose a new deep learning architecture to segment the fetal skull boundary and fetal skull for fetal HC measurement. This work presents the development of a new deep learning method for the segmentation of two-dimensional ultrasound images .We propose a novel ResLInk-Net a semantic segmentation model optimized for fetal skull segmentation. We leverage Link-Net as a base model with the integration of residual blocks (Res) and use a dilation convolution to segment the Fetal Skull from noisy US images. Our ResLink-Net achieved a mean Dice Score Coefficient, Hausdorff Distance, Recall, and Precision of 86.00%, 28.18, 87.00%, and 91.00%, respectively. The high accuracy of our method shows that the use of residual blocks and dilated convolution makes the segmentation of the fetal skull in US images as a standard examination during pregnancy.

Keywords:-

2D Ultrasound Image, Fetal Head, ResLink-Net, Deep learning

ISBN: 9789391553401

International Conference on Advances in Science and Engineering (ICASE - 2022)

Thoothukudi, Tamil Nadu, 24th and 25th March, 2022

CNN Based Fine Grained Image Classification for Fish Images

R. Fathima Syreen, Research Scholar, Reg.no-18121192282003,Sarah Tucker College,Manonmanium sundaranar university, Tirunelveli, India

Dr. K. Merriliance,Associate Professor,Dept. of MCA, Sarah Tucker College, Tirunelveli, India

Abstract:-

Fine-grained classification is an important and extremely challenging task in computer vision. The intra class similarity is large in fine grained images which makes difficulty in identifying discriminant features that fully represent the object. Fish image recognition is very challenging due to subtle differences in shape, pose, illumination and appearance. With the advent of the Convolutional Neural Network (CNN), encouraging accuracy has been achieved on fish image recognition.If we can learn more discriminative features and more detailed features, the classification performance can be improved. In order to solve this problem, VGG16 CNN network is used to obtain more accurate features. To improve the classification accuracy, improved triplet-loss function and weighted softmax-loss function were combined which restricts interclass distance and increase intraclass distance. The Experimental results show that the proposed method effectively improves the fine-grained classification of fish images.

Keywords:-

CNN,VGG16,Fine grained image classification;

International Conference on Advances in Science and Engineering (ICASE - 2022)

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Comparative evaluation of physiological post-harvest root deterioration using multiclass support vector machine

Dr.S.Piramu Kailasam, Department of Computer Application, SadakathullahAppa College, India.E-mail: spkpramu@gmail.com

Abstract:-

Phenotyping and root disease detection is essential towards food security and agriculture. Recent machine learning based phenotyping offers the ability to study quantitative potato root physiology. On the otherhand manual data interpretation requires lots of manpower and process time. This study, present an approach of image processing techniques with machine learning classifiers to allow diagnosing several stages of potato diseases in different climatic temperature. Our segmentation approach and ensemble SVM classifiers demonstrate behaviour, appearance, development and disease classification. In this manner our proposed approach leads to a path of automatic potato disease detection on a massive scale.

Keywords:-

Image color analysis, Image segmentation, Feature extraction, Feature selection, Support Vector Machine

ISBN: 9789391553401

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and secured .....Fourth..... *position*

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b) Weight Category — Snatch — Jerk —

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and secured SECOND position

a) Time / Distance / Height ——— (if applicable)

b) Weight Category ——— Snatch ——— Jerk ———

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and secured SECOND *position*

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POSITION : FIRST ✓ / ~~SECOND~~ / ~~THIRD~~

VENUE : ANNA STADIUM - PALAYAMKOTTAI DATE : 27.08.2016

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MERIT CERTIFICATE

NAME : B. MURUGAM @ MURUGESAN

COLLEGE : S. A COLLEGE

EVENT : 4 x 100 mt RELAY CATEGORY : MEN / ~~WOMEN~~

POSITION : ~~FIRST~~ / SECOND / ~~THIRD~~

VENUE : ANNA STADIUM - PALAYAMKOTTAI DATE : 27.08.2016

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