[1] Muhammad Sohaib, Nasir Ahmed and Nasru Minallah, (2013) “Image Enhancement for the 3-D Reconstruction in the Uncontrolled Environment using Shape from Silhouette”, International Journal of Computer Applications, vol. 70, issue. 11, pp. 49-53, June 2013.

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Image Enhancement for the 3-D Reconstruction in the Uncontrolled Environment using Shape from Silhouette

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ABSTRACT

Among the multiple models for 3-D shape reconstruction, Shape from silhouette (SFS) is one of the fast and simple 3D shape rendering techniques as compare to other approaches. In SFS model multiple images captured from different viewpoints in a controlled environment are used as input data at the front end to extract silhouette and are free of noises. Silhouette extraction from such well-defined input data is easy and accurate, having no loss of information while extracting the silhouette. On the other hand images from uncontrolled environment involve many degradation factors. Common and frequently degradation factors are motion blur and noise addition which effects acquired image quality, illumination and resolution seriously. The proposed work is an effort to extract useful information from such environmentally variant images. The successful reconstruction of the image is main emphasis.

General Terms

3D Modeling, Image Enhancement, Degradation Reduction

Keywords

3D reconstruction, silhouette, SFS pipelining, additive noise, blurriness

1. INTRODUCTION

Shape from Silhouette is one of the available 3D shape reconstruction techniques. In this, images from multiple viewpoints are captured and silhouette information is extracted from each picture. Later on using silhouette information and camera matrix generated from camera locations along with the subsequent steps of SFS pipeline well approximate resembled 3D model to the original object shape is reconstructed[1].Silhouette is the feature less expression of an object shape. Silhouette extraction from the input set of images is the basic and initial step in SFS 3D shape reconstruction pipeline. Accurate extraction of silhouette is needed for good quality 3D shape reconstruction. Images used for this purpose are of high details and are captured in controlled environment having uniform and known background. So they are of uniform illumination, high resolution, and are free of other kind of degradations. Acquiring object shape from such well-defined image is an easier. On the other hand photographs taken in an open environment or images acquire after traversing through some transmission media are exposed to different kind of noises and degradations. In this paper contribution to the front end of the Shape from Silhouette is made to propose an invariant system for environmentally degraded images.

SFS pipeline used for our work is obtained from [10]. The pipeline works on the basis space carving concept. First silhouettes are extracted from input image. Silhouette extraction step is followed by volumetric reconstruction of shape through voxels. After the shape reconstruction non object voxels are removed from convex region by space carving also known as refinement step. Finally coloring of refined 3-D shape is done by surface coloring. Images and camera calibration matrix are acquired from University of Oxford Robotics Research Group [9].

Image degradation is defined as the process due to which unwanted information is added in image. Degradation may occur during image accusation or unwanted information is added during the process of transmission in remote imaging scenarios. A simple degradation process is defined as under

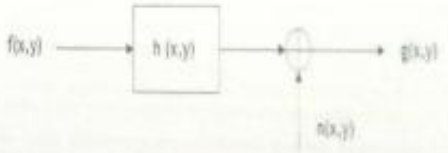

Fig. 1: A simple, Image degradation Model

In Figure 1, g(x, y) is the resulted image after input image f(x, y) passes through degradation function h (x, y) and addition of noise n(x, y). In our case degradation function is blurriness and noise function is additive and spatial noises.

Digital Imaging enabled human beings to develop photographs to Mirror scene or some kind of information of an object frequently, anywhere they want. Real Time picture is the ideal representation of the observed scene.

Although digital photography is quite sophisticated and well matured that can produce excellent level of results, but the observation process is still not ideal or error free. Many factors easily introduce noise or any other kind of degradation in a captured image. Blurriness is one of such unwanted phenomenon, which introduces unwanted information in the image. Most common factors that introduce blurriness in the images are camera shake and defocused image. Silhouette extraction from such degraded is difficult and leads to ambiguous information. Consequently, the developed 3D model at the end of the SFS process deviates from its original shape.

Noise is an additive process. It causes color or brightness variation in the image. Impulsive noise added during

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Classification and Regression Analysis of the Prognostic Breast Cancer using Generation Optimizing Algorithms

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ABSTRACT

Breast cancer is one of the main causes of female fatality all over the world and is the major field of research since quite a long time with lesser improvement than expected. Many institutions and organizations are working in this field to lead to a possible solution of the problem or to lead to more understanding of the problem. Many previous researches were studied for better understanding of the problem and the work done already to remove redundancy and contribute to the field. Wisconsin-Madison prognostic Breast cancer (WPBC) data set from the UCI machine learning repository was used for training of 198 individual cases by selecting best features out of 34 predictors. Feature selection algorithms were used with machine learning algorithms for feature reduction and for better classification. Different feature selection and generation algorithms were used to improve the accuracy of classification. Many improvements in accuracies were found out by using different approaches than the earlier studies conducted in the same field. The Naive Bayes and Logistic Regression algorithms showed 8.28-12.32% and 0.82-1.52% accuracy via 10 fold cross validation analysis improvement accordingly by using different feature selection and generation algorithms with these classifiers and gave better result than the best results known for these classification algorithms.

General Terms

Pattern Recognition, Classification, Cancer.

Keywords

Naive Bayes, Feature Selection, Logistic.

1. INTRODUCTION

Motivation: Breast Cancer is considered as one of the most occurring cancers [13], by the number of new cases diagnosed. Two major subtypes of breast cancer are basal and luminal respectively. Luminal is the most common type and it has higher rate of occurrence and prognosis than basal [4]. Differentiation between these two is vital for Doctor.

In this paper, different types of classification algorithms to differentiate between good and bad prognosis i.e. Recurrent and Non Recurrent have been applied. We have given the result of classification before feature selection and after feature selection. 11 classifiers were used in this study with 4 feature selection and generation algorithms. The result of the majority of the classification and Regression algorithms improved after feature selection and generation algorithms different from those of the earlier studies. In some cases it improved a lot like in Rule induction with feature selection and without feature selection the accuracy increase twice of the original one as shown in table 3. While in some cases the accuracy of the classifier remained constant.

Related Work: Researchers [1] have measured the accuracy of classification algorithms on Wisconsin Madison Breast Cancer Data set. We shall discuss those problems which are related to pattern recognition techniques for classification problems and specially related to prognosis of breast cancer data taken from Wisconsin Madison Breast Cancer.

In the research [8] K-Nearest Neighbor algorithm was used which gives 1.5% better result than the other techniques used for this problem. Generally Doctor Diagnosis patient through his tests, physical condition and patients history, the amount of information may be insufficient, contain uncertainty, information may be misleading. For better result they apply machine learning techniques for better classification and they applied this to Wisconsin Madison breast cancer problems.

In study [2] it was proposed that recently every statistical machine is consistent for nonparametric regression problems is a probability machine i.e. provably consistent for this estimation problem. How Random forest and Nearest Neighbors are used to find the consistent estimation of individual probabilities. Two Random Forest and Nearest Neighbor algorithms are described for estimation of individual probabilities. They have done simulation study for the validity of these methods by analyzing two well known datasets on the diagnosis of diabetes and appendicitis.

In [9] Different classifiers Naive Bayes, Multilayer perception, Decision tree (j48), Instance Based for K-Nearest Neighbor (IBK) and Sequential Minimal Optimization (SMO) classifiers are used with feature selection algorithms PCA and SMO. Three types of breast cancer dataset are used i.e. Wisconsin Prognosis Breast Cancer (WPBC), Wisconsin Diagnosis Breast Cancer (WDBC) and Wisconsin Breast Cancer (WBC) taken from UC Irvine Machine learning Repository. The Data mining software tool used for classification of these datasets is WEKA. Fusion of different classifiers is used with feature selection algorithms to find the best classifier for the three datasets. The experimental result shows that J48 and MLP with PLA feature selector performed the best classification for WBC dataset then other classifiers. Similarly fusion of SMO and MLP or SMO and IBK, or lonely SMO performed best while for WPBC dataset fusion of SMO, J48, IBK and MLP performed better than others. In [4] the performance of different classifiers Majority, Nearest

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Experimental Comparison of Face detection Techniques on the basis of Intrinsic and Extrinsic Parameters

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ABSTRACT

Face detection is an important contributing factor to make computer vision applicable to problems of everyday life. Of the techniques used for face detection, two are more efficacious i.e. skin detection and viola-jones based face detection. These two techniques have limitations of their own. One of the most restricting factors to these techniques is the color cluster of the image. Face detection algorithms are trained on a set of images. Those images are sure to be occupying a particular color cluster of the color plane because it is not possible for the set to contain encompass the full color space. If an image occupying a color space other than that on which the algorithms is trained is an input to the algorithm, the result is not optimal then. This paper explores the effect of different color clusters on the performance of both techniques. Images of color clusters other than that on which the algorithms are trained are given to the algorithms and the results are analyzed to decide the optimality of the techniques in face of images on which the algorithms are not trained.

Key-words:

Viola-jones, Face detection, Color cluster, Color spaces.

1. INTRODUCTION

Skin detection make us able to find different human body parts and its applications is spread over a wide range of operations i.e. from face detection to human hand and other body parts detection; it is also useful in recognition of humans, stored in a database, in an image. The skin detection can also used be in filters which are used for blocking of objectionable contents. Skin detection is the first task in computer vision towards face detection [1]. For human faces the skin color is used as distinguishing feature. And in a simple background image the skin detection based face detection is used [2].

The face detection task makes the area of computer vision able to implement the real world problems such as biometrics security systems [3]. It is of great interest over years and there are different techniques that are used for skin detection. Different approaches for face detection are discussed in [4] [5]. The author in the review papers [4] [5] has divided the face detection techniques in the following four categories: (1) Feature invariant method is based on the principle to find structural features which do not vary with variation in the position, viewpoints or illumination conditions of an image and then use these feature in order to find face [6]. (2) Knowledge based approach aims to use rule-based approaches to encode knowledge of the about the typical facial structure. Normally the rules contain the relationship among the features of the face [7]. (3) Appearance based approaches: In this method the technique is trained on a set of training images, which contain faces of different kinds, from which models of faces are extracted. And the models are then used for detection [8]. (4) Template matching approaches: In this approach many standard facial patterns, which describe a whole face or various facial features separately, are stored. And for face detection the correlation between the stored template and the input image is computed [9].

In this paper the results of experiments done on two most important face detection techniques i.e. viola-jones and face detection based on skin detection, are shown. The effect of different color clusters on these two techniques is studied. It is shown here the impact that both these techniques are prone to color clusters of different kind.

The viola-jones face detection framework takes its decision on the basis of different features of the image. This technique is based on three features. The two rectangles feature whose value is the difference between pixel values in the two rectangular regions. The shape and size of the region are the same and they are horizontally and vertically adjacent. The three rectangle feature whose values are computed as: sum the two outside rectangles and subtract it from the center rectangle. And at last the four rectangle feature values are computed as the difference of the diagonal pairs of rectangle. These features result in a new image known as integral image [10]. These features may depend on the illumination, image orientation, image color spaces and saturation. The skin detection technique uses the pixel color to classify it as skin or not [3].

Various efforts are made to improve the skin detection techniques. (Haddi et al., 2002) developed an approach for detecting color images in different conditions this approach was developed using skin locus and hierarchal detector. (Viola, 2004) improved his viola-jones framework developed for detection in [10], and they extended it to the non frontal faces. For different views of faces different detectors were designed and a trained a decision tree for determining the image class. (Sahbi et al., 2006) used skin color and image segmentation for face detection. (Singh, 2006) carried out an experimental work on face detection based on skin color for different color spaces.

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Robust Video Transmission with High Error Correction Capable Binary LDPC Codes

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ABSTRACT

Recently wireless multimedia communication systems and services are getting great attention from both academia and industry because of its diverse capabilities and end-user requirements. Keeping in view the current advancements in channel coding, we are offering a robust video transmission solution with high error correction capability using Binary Low Density Parity Check (LDPC) codes. The input video sequence is Pulse Code Modulation (PCM) coded and transmitted over the wireless channel contaminated with noise. The quality of the resultant video obtained at the receiver side after LDPC decoding is computed using Peak Signal-to-Noise Ratio (PSNR), objective video quality evaluation metric. Furthermore, Bit Error Ratio versus PSNR curves of the advocated transmission setup was obtained and its performance is compared with a benchmarked scheme, with Binary LDPC codes having single iteration. More explicitly, video transmission over noise contaminated wireless channels with powerful channel coding such as LDPC codes and reasonable number of system iterations for secure video transmission can achieve beneficial performance gain in-terms of high-video quality and low BER of the resultant received video sequence.

Keywords: Component; Binary LDPC Codes, YUV video, Encoder, Decoder, Peak Signal to Noise Ratio (PSNR), Bit Error Rate (BER)

I. INTRODUCTION

Nowadays wireless multimedia communication devices and services are getting great attention from both academia and industry because of increase in its capabilities and end user demand of multimedia services. Provisioning of diverse multimedia services within the limited bandwidth resources motivates the design of robust video streaming systems so that

is why video streaming has become one of the most exciting areas of research within wireless communication research community. In mobile phones, video streaming of news and entertainment clips is now widely available and non-expert in search and rescue operations real time audio-visual communication can save lives. All these applications need reliable security in storage and transmission. Satellite television, video conferencing, medical and military imaging systems are examples of those applications where main focus is on perceived video quality. On wireless channel delivering good video quality is difficult and challenging because of unpredictable nature of the wireless communication channel and the requirements of high data rate and low latency for good quality video transport.

For video transmission using wireless communication channels, our main target is high compression efficiency of our transmitting video [1] due to its low bandwidth capability. Furthermore, wireless communication imposes errors and effects video signal [2] therefore the coded video should also be robust to channel errors. So for protection of video from channel effects we can use powerful channel encoder which can dissolve the effect of channel errors.

Forward error correction using LDPC codes is one of the exciting areas these days. Nowadays people are focusing on video communication using LDPC codes because here it is already demonstrated using different research works that LDPC codes give much better performance in terms of forward error correction, relative to the traditional channel coding counter parts [4, 5].LDPC codes are best for video transmission over noisy channels [8] against the effect of various channel impairments, such as noise, interference and fading. In such circumstances the use of LDPC decreases loss of data which intern increase the quality of service (QoS).We use YUV format video for video transmission in our research paper because YUV format encodes brightness information of