

# A MATLAB BASED TEXTURE FEATURE RECOGNITION

*N.S.MURTHI SARMA\**, *T.V.JANARDANRAO\**, *V.DHANA RAJ\**, *CH.SRIDEVI\**,  
*D.BHAVANI\**, *\*\* Y. HARIPRASAD*

**\*\*Bigtex Bio Photonics (BTBP) Centere**

**\*Bonam Venkatachalamayya Engineering College, Odalarevu,  
Andhra Pradesh, India, 533210.**

**ABSTRACT :** *In this paper, a new texture recognition algorithm is proposed. The simulation results of the proposal on matlab are encouraging. Further Investigation is in progress to improve retrieval accuracy by using other features*

**Key Words:** *Texture, Simulation, Recognition, Matlab*

## 1. Introduction

In statistics and image processing, to smooth a data set is to create an approximating function that attempts to capture important patterns in the data, while leaving out noise or other fine-scale structures phenomena. Many different algorithms are used in smoothing. One of the most common algorithms is the moving average, often used to try to capture important trends in repeated statistical surveys. In image processing and computer vision, smoothing ideas are used in scale-space representations.

### *A.Theoretical back ground*

Generally, the images dealt in virtual environments or entertainment applications possess high fidelity resulting in large storage requirements. Digital storage of images has created an important place in imaging. Image quality metrics are important performance variables for digital imaging systems and are used to measure the visual quality of compressed images. Out of several quality measurement, perceptual quality measurement is felt as suitable for the context.

### *B. National and International status of the work*

The perceptual quality measurement techniques are based on models of human visual perception like image discrimination models and task performance based models[1]. Image quality measures (IQM) are figures of merit used for the evaluation of imaging systems or coding/processing techniques. Image quality measurement is still an unsolved problem today. There are at least two factors, which contribute to difficulty in finding a complete algorithm for image quality measurement. First factor being that there are many different kinds of noises and each can affect the quality of image differently. Secondly it is not simple to mathematically prove the quality of an image without human judgment.

Image QA algorithms can as well be classified as "Full-reference" or bivariate, in which the algorithm has access to the perfect image, "No-reference" or univariate, in which the algorithm has access only to

the distorted image and "Reduced-reference", in which the algorithm has partial information regarding the perfect image. All algorithms try to map the reconstructed image to some quantity that is positive and zero only when original and modified images are identical and also increases monotonically as the modified image looks worse. It is very useful to be able to automatically assess the quality of images

when the number of images to be evaluated is large. Daly's visual difference predictor (VDP) is a popular bivariate tool to assess image quality [2]. It computes a map of visible differences between a degraded image and the reference. The Karunasekera and Kingsbury (KK)[3] model gives a quality mark to the degraded image compared to the reference for the assessment of visual quality of the JPEG compressed image. When two images are compared in terms of quality, one desires a measure that parallels human visual system with the expectations that the differences in quality judged by human eye to be large are also mathematically large and if the differences are insignificant to human eye, the error size should be small. Dung[4] and others proposed the Image Quality Measure Error (IQME), which supports measuring image quality locally as well as globally. It takes into consideration the effect of the change of each pixel value to the local area, which contains that pixel and the effect of that area to the whole image. Texture analysis has history of more than three decades. During the 1970s and early 1980s, the algorithms have been mainly based on first and second order statistics of the image pixel gray level values as spatial domain gray level co-occurrence matrix (SDCM) and neighbouring gray level dependence matrix (NGLDM). In the mid 1980s, model based methods such as Markov Random Fields (MRF) and simultaneous autoregressive (SAR) appeared[5,6,7]. Wavelets gained importance in late 1980s. Texture analysis is a crucial problem since it conditions the quality of

segmentation and interpretation in lots of applications such as in the textile industry or for satellite imaging. Texture analysis finds applications in image segmentation and classification, biomedical image analysis, and automatic detection of surface defects. In this paper, an initial result based on Matlab coding of [1] is discussed. This work is carried under collaboration and assistant ship of Bigtex Bio Photonics (BTBP), A U.S.Based center, BVCITS campus amalapuram.

## **2. Brief Out line of the Coding Used for Investigation**

Few lines appear below describes the coding methodology that helps to compute the result.

A. *Conversion of RGB image to Gray image. As an example:* In RGB pixel information image there are three component(R, G, B) and each component has a fix intensity say 190, 183, 175 respectively. This uses the equation  $I = 0.333Fr + 0.5Fg + 0.166Fb$ . (Typical)[ 1] and in gray pixel information image the first pixel intensity is found as 184.

B.*An algorithm named myprojec.m returns its output to variable 'varargout'. The algorithm accepts varargin as variable. Also, a myprojec.jpg will be used for this.This algorithm raises the existing singleton\*.*

C. *MYPROJEC('CALLBACK',hObject,eventData,handle s,...) calls the local function named CALLBACK in MYPROJEC.M with the given input arguments*

D. Starting from the left, property value pairs are applied to the GUI before myprojec\_OpeningFcn gets called. An unrecognized property name or invalid value makes property application stop. All inputs are passed to myprojec\_OpeningFcn via varargin. This requires further focus on Functions such as GUIDE, GUIDATA and GUIHANDLES that are usually available on tool menu.

E. *Following is the process before myprojec is visible.* The process is a function named myprojec\_OpeningFcn with variables as hObject, eventdata, handles, varargin. This function has no output args. hObject handle to figure. eventdata is a reserved. handles structure with handles and user data. Varargin command line arguments to myprojec.

F. Out put will be a function named myprojec\_OutputFcn, with input variables as explained above.

G. Usage of texture image etc are discussed elsewhere[1].

H. Above step initiates the methodology for generation of blackandwhite area image.

I. Here, Using few more subroutines[1], boundary between different textures.

J. Above steps gives the replica of input image in black and white versions with more clarity

## **3. Result and discussion**

The algorithm proposed in this paper is formulated and simulated with the assistance of BTBP,. One of

the authors after due training produced the following results.

Using a Live input image , Fig.1., of course scanned, is used to obtain a gray image of it i.e.Fig.2. For this help of coding is used This image almost resembles but lacks lot of clarity . This gray image is source to bwarea (black and white area) image 3. This image is input to the algorithm that obtains Fig.4 . This uses extracting or implementing different texture featurte that gives exact replica of Fig 1 in block and white form.



Figure1: Jpeg input to the process



Figure2: Gray scale Image of Input Jpeg.



Figure3: Black and White area open of Fig.2



Figure4: Black and White area open after introducing texture features.

#### 4. Conclusion

In this research, an efficient texture based object recognition algorithm is proposed. The algorithm is practiced with the training provided by BTBP. One of our faculty implemented the training in the algorithm that gave the results embedded in this paper. The result shows that the approach has given good result comparing to other existing texture recognition algorithm. Further research may be initiated to improve retrieval accuracy by using other features

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