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Escalating brink discerning color effigy by coalesce shifts accompanying logical approach

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Abstract

Brink detection is a fundamental step in computer vision that is necessary to point out the true brinks to get the best result for the matching process.various algorithms and techniques are used forbrink detection to understand the fundamental concepts in identifying sharp brinks. Brink discerning is a procedure of finding out significant changes in an image by improving its quality and corresponds to the brinks in the image. Here a sample effigy is taken as a case study and MATLAB software is used for analyzing the case. Here we are suggesting an escalation by coalesce simple shift and logical operations.Here we are convertingRBG effigy into a CMY(K)effigy,then the effigyisgiven as an input to MATLAB which convertsit to a binary image data is then shifted left, right, up and down. Once the shift operations are performed, then logical AND operation is performed betweenshifted and original effigy. Then the results are stored in different variables, XOR operations performed between the results that are stored and then OR operation is performed on all results obtained after XOR operation. This technique is repeated for different values of threshold to get the final resultant constituting of only brink of the input effigy.

Keywords: Canny edge detection, YUV, YIQ, YCbCr, HSV, CIE XYZ, CIE LAB, RGB, CMY(K).

I. PREAMBLE

Brink discerning is a procedure of finding significant changes in aneffigy. This method gives better comparable output, then other brink detection techniques as we are adopting*CMY(K)* which is better than RGB color espousal.Brink is basically thePoint where sharp changes in brightness occur typically from the border between different objects [1].Brinks characterize object boundaries thus helpful for identification of objects in image and segmentationregistration[2]. Many brink detectors are used these days, but the *Canny Brink Detection techniquegives better output as compared to other brinkdetection techniques such as Sober, Prewitt and Robert*[3].In this paper, we discussed on various classifications of edge detectors in the (Section. II). It is more complex which uses two threshold values. So, its computational expenses are more as per the of study of Dr.C.Chandhra Shekar [26].*90% of the brinks are about the same in gray level and color images that implies 10% of the brinks are left over in gray level.*Since,color images give more information than gray-level images, this 10% left over brinks may be extracted from color images. Various color espousals and their categorizations are discussed in (Section III).

In this proposed technique computation is done on four matrices. Three matrices are the CMY(K) (Cyan-Magenta-Yellow) matrices of RGB (Red-Green-Blue) image and fourth matrix is combined form of all three matrices obtained by convertingthe image to a grayscale image. Now all these four matrices are converted into binary matrices at different threshold values. Afterwards, thismatrix isshifted up, down, right and left accompanyinglogical operations are performed inthis matrix. At last all results are summed together to get a final image in which onlythe brinks are present. A sample code along with the coalesce is briefed in (Section IV). This technique is tested on a sample effigy with discontinuous sharp brinks with different color espousals such as HSL, HSV, YUV, RGB,Munsell and CMY(K) then, the results are compared with the results of the other methods in the (Section V).

II. BRINK MODUS OPERANDI

The variousbrink detection technique uses different operators to detect the changes in the gradients of the gray level. The main two operators in image processing are gradient and Laplacian which are also called 1st order and 2nd order brink detectors. Laplacian based operator adopts MARR HILDRITH edge detector. Gradient based operator adoptsCANNY &CLASSICAL edge detectors. It further adopts three operators, namely *ROBERT, PREWITT, SOBEL* operators. These three CLASSICAL operators are easy to operate, but highly sensitive to noise. I.e., CANNY edge detection is used comparatively high even though it is costlier.

Fig.1:Classification of Edge detectors

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The greatest challenge is to locate the sharp brinks which are discontinuous. These discontinuousbrinks bring changes in the pixel intensity which defines the boundaries of an object in the effigy. They are many methods such as *DRF, CRF, MSF, CSF, PAM, CF, RF and mBm* for incorporating spatial deficiencies in classifying the discontinuous boundaries. Of all the above *Discriminative Random Field*(DRF),*Marvok Random Field*(MRF) and *Conditional Random Field*(CRF) demand very careful characterization for convergence[28].

III. COLOR ESPOUSAL

Colors play a vital role in communicating with the daily encountered objects that defines their shape, size and species. With the knowledge of color models different formats can we represent as of below with their parameters. The properties of the color espousal depend upon the parameters luminance, brightness and hue typically the color espousals have three or four color components that generate the system. To escalate the brink from the effigy properties of the parameters place a vital role. Few of the standard color espousal with their properties are stated below.

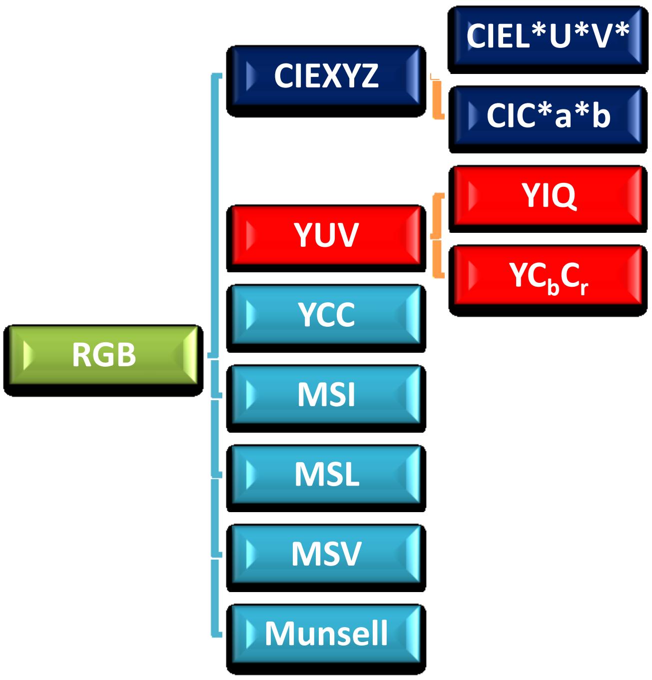

Fig.2: Classification of Color espousals

A. *YCbCr espousal*

YCbCr color espousal is an addictive space that is defined by three parameters luminance as Y, Cb and Cr are chrominance blue and red. Advantages of the system are the image can be perfectly compressed and you can be used separately for storage in high resolvingto improve the performance. The flaws with this espousalare color range is restricted in TV because of its compression value and it always depend on RGB for displaying the signal.

B. *YIQ espousal*

YIQ color space is defined by three parameters Y, I, Q namely luminance and chrominance and color information. The ability of YIQ is separating the gray scale information from the color data property enables to represent the same signal for both colors black and white, besides beingdisadvantaged for selecting the brink of non-continuous spaces.

C. *HSV espousal*

HSV is easily defined by hue, saturation and value which is perceptible by the human eye. Problem with HSV is that an undefined chromatic hue points is sensitive to value deviations of RGB and unstable hue may lead to angular nature.

D. *YUV espousal*

The parameters of YUV are defined as luminance for Y, U&V stands for the chrominance value of the effigy. The ability of YUV is decoupling the luminance and color information where the image can be processed with no effect on color components. The flaw with YUV is the limitation of YUV standard effigy cannot be recreated on large screens.

E. *CIE UV espousal*

CIE UV espousal is termed by luminance as L, saturation as U hue angle as V. The advantage with this espousal is that all the parameters are uniform by which it suffers uncertainty and device independence. This espousal cannot be effectively used for brink discerning.

F. *CIE LAB espousal*

CIE LAB espousals have similar properties to CIE UV which is defined by L for luminance, A for red to green, B for blue to yellow where the luminance is an effective parameter. As luminance is high effigy cannot yield expected quality of discerning at the discontinuous brinks.

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G. *CIE XYZ espousal*

In CIE XYZ espousal Y stands for lightness and X, Y are color information. It is uniform and used for mixing the color for transforming representation. The flaw in the system is a visualization of the image is low in the dark areas. This may affect the borders of the in an effigy.

H. *HSL/HSI espousal*

Hue, Saturation, Lightness/ Hue, Saturation, Intensity is performed for users view since the components are correlated better with human color perceptibility. The chrominance components (H & S) are associated with the wave humans perceive. This espousal is not uniform and do not supply insight for color manipulation

I. *Munsell espousal*

Munsell espousal has value, hue and saturation as parameters.Where, hue is the effective parameter. Due to its hue nature the boundaries of the effigy are not restricted and differential with regular color systems. The problem with this espousals it is highly interpolated that causes erroneous and also not suitable for some effigy editing applications.

J. *RGB espousal*

RGB espousal is most commonly used in several computer applications. In this espousal Red, Green and Blue works as effective parameters. In this espousal no transformations are required to display the information on the screen, for this reason RGB is considered as a common base for various applications. Existing systems use RGB as a standard color espousal in many brink deserving applications. The problem with the RGB espousal is it reflects the use of CRT since it is a hardware oriented system. It is difficult to determine the specific color in RGB espousal.

K. *CMY(K) espousal*

Cyan, Magenta, Yellow and Black work as parameters where there are no effective parameters. This espousal is commonly used for production printer color.It is better than RGB to reconstitute the color system will used by photographers who explored a set of three filters known as the substrate of *CYAN* filter (C), which transmits blue and green, a *MEGENTA* filter (M)That transmits blue and red, a *YELLOW* filter (Y) and a Key filter (K)that transmits green and red[10]. This method can restore the new true colors.

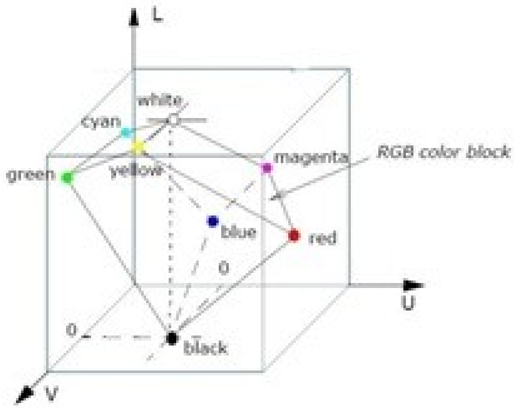

Fig.3: CMY(K) to RGB color cube

The advantages with a color system is to understand and manipulate.The colors you get when combining CMY(K) values (0%, 50%, 100%) are more better than the ones you get with RGB values (0, 128, 255). The ability of the CMY(K) model is significantly reduced by the amount of image blurring that can occur whenever an RGB coloration model is attempting to achieve black. RGB also under performs in this situation because its constant re-applications of the three colors, usually serves to overly saturate the printing medium. It may fail to achieve a rich enough black by blending only red, green and blue. In short, the differences between RGB and CMY(K) are pronounced and cannot be overlooked[1][7].

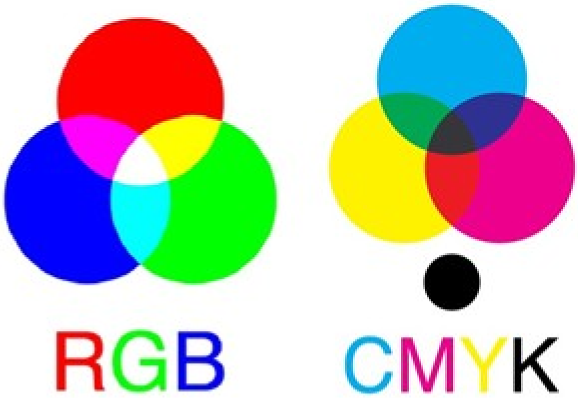

Fig.4: Difference between RGB & CMY(K) color espousal

We would be able to specify how our colors will get printed, something that is not currently being possible at all.CMY(K) is considered subtractive because it calculates its correct hues by subtracting from the initial brightness of the paper in order to make up the final target value. For this very reason, CMY(K) uses lighter secondary colors than those used by RGB coloration modes. This is due to the fact that producing darker tones via the CMY(K) method would require a great deal. The obtained image is more complex than the traditional RGB image[10]. The difference in intensity can be calculated to obtain the components R, G and B that are essential for displaying a true color on the screen[10].

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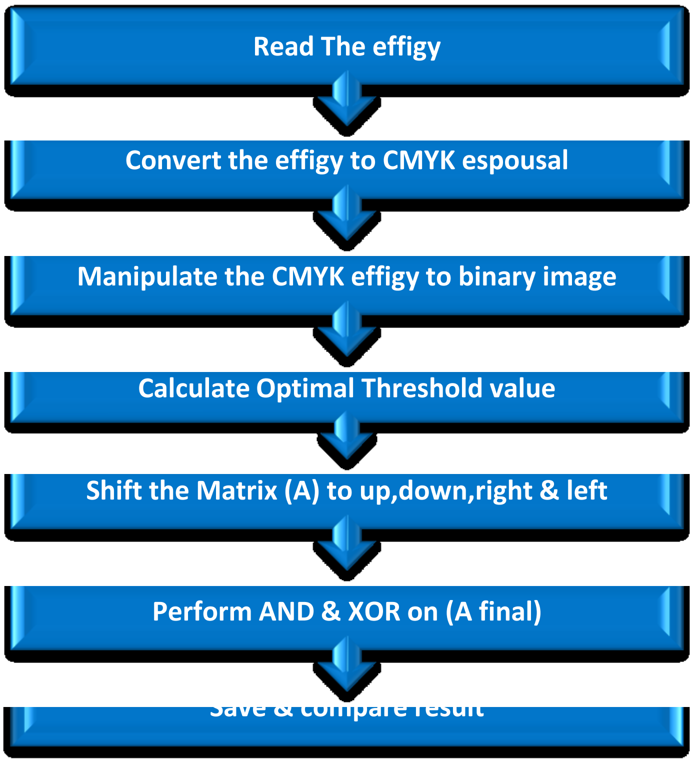
IV. COALESCE

Here shift operations are used to detect brinks of the color effigy. Let us assume that the effigy is converted into a 9*10 matrix binary effigy(let A). The matrix A of the effigy is first shifted up (A1). (A1)matrix is then rotated downand resultant matrix is stored as a matrix(A2). Later (A2) matrix is turned rightand saved as (A3). The stored matrix is then turned to left



and the result is stored as (A4). Thefollowing operations are performed for shifting the matrices of the effigy, finally (Afinal) is obtained. After obtaining the (Afinal) logical AND operation is performed between the original effigy matrix (A) with the rotated matrix (Afinal) the resultant is then operated on an XOR operation to that of the OR operation result.

MATLAB code for the coalesce for the shift and logical operations are as below:

(MATLAB code for the Coalesce)

```
clear all;
F=imread('bb.jpx');
fixure,imsyow(F);
A=im2bw(F);
fixure,imsyow(I);
[x y]=size(I);
A1(1:x-1,1:y)=I(2:x,1:y);
A1(x:x,:)=I(1:1,:);%up
A2(2:x,1:y)=I(1:x-1,1:y);
A2(1:1,:)=I(x:x,:);%down
A3(1:x,2:y)=I(1:x,1:y-1);
A3(:,1:1)=I(:,y:y);%rixyt
A4(1:x,1:y-1)=I(1:x,2:y);
A4(:,y:y)=I(:,1:1);%left
AA1 = (I&I1);
AA2 = (I&I2);
AA3 = (I&I3);
AA4 = (I&I4);
AA1 = xor(IA1,IA2);
AA2 = xor(IA3,IA4);
AFinal = or(AA2,AA1);
fixure,imsyow(IFinal);
```

V. EXPERIMENTAL PERUSAL

In this section we have presented the results of a sample effigy with discontinuous sharp brinks along with the comparative results generated by the existing RGB espousal system, we would like to compare and contrast the quality of results generated by our technique with the existing method.

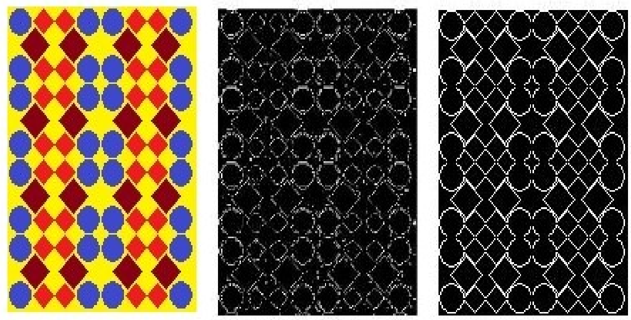


Figure: 5.Effigy with its(x) RGB&CMY(K)(y) output

The above result (x) is generated from the effigy RGB where it has sharp brinks with discontinuous spaces the result (x) looks to be shabby when compared to that of the result (y) that is generated by theCMY(K) color effigy. The reason for the poor quality in RGB espousal is, it reflects the use of CRT since it is a hardware oriented system. It is difficult to determine the specific color in RGB espousal by which the brinks of the effigy gets distorted.The above result clearly shows that CMY(K) presents a better resultant which helps in clear analysis.

VI. EPILOGUE

In this paper *gradient based operator* is used by coalescing shift operations accompanied logical approach in escalating brink discerning. Brink discerning helps as a primary step in identifying an object from an effigy in various computer vision applications. Even though there are many detectors we suggest *canny edge detector*is more suitable for obtaining a better performance. We have multiple color espousals available in creating an effigy, but*CMY(K) is betterthan any other color effigy for providing a satisfactory result*. Time taken by this technique is less when compared to that of the other methods, output is also more accurate than the existing edge detectors. The technique uses simple shift accompanied by logic operations to compute the brink of an effigy.

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VII. HOMOLOGUS WORKS

The goal of our paper is not just to enhance the quality of the brinks, but also to help other fields of research such as medical, Mexican hat operations, computer algorithms, digital signal processing, diverse adaboost algorithm, multi-dimensional systems, live stream photo and video editing.

References

[1] S Jayaraman, S Esakkirajan, T Veerakumar , "Edge Detection" Digital Image Processing, Tata McGraw Hill,2010,pp.381
[2] Anil K. Jain, "Edge Detection", Fundamentals of DigitalImage Processing, Prentice Hall of India,2002,pp.347
[3]http://www.mat.univie.ac.at/~kriegl/Skripten/CG/node13.html
[4]Rafael C. Gonzalez "Digital Image Processing Using MATLAB",
[5]Oge Marques,"Practical Image and Video Processing Using MATLAB".IEEEWilley-IEEE presshttp://www.ogemarques.com/
[6]http://www.mathworks.in/help/images/converting-color-data-between color-spaces.html
[7] J. M. Park and Y. Lu (2008) "Edge detection in grayscale", in B. W. Wah Encyclopedia of Computer Science and Engineering, [8]BARGHOUT, Lauren. "System & method for edge detection in image processing and recognition." WIPO Patent No. 2007044828. 20 Apr. 2007.
[9] R. Kimmel and A.M. Bruckstein "On regularized Laplacian zero crossings", International Journal of Computer Vision, 53(3) pages 225-243.
[10] T. N. Janakiraman"Color Image Edge Detection using Pseudo-Complement andMatrix Operations", World Academy of Science Engineering and Technology,
[11] Kandel ER, Schwartz JH and Jessell TM, Principles of Neural Science, 4th ed., McGraw-Hill, New York. pp. 577–80.
[12]"Digital Color Image ProcessingAndreas" by Koschan, MongibidiISBN: 978-0-470-14708-5
[13]"Color Image Processing and Applications" By Konstantinos N.Anastasios N. Venetsanopoulo
[14]"The Colour Image Processing Handbook" By Stephen J. Sangwine
[15]http://dba.med.sc.edu/price/irf/Adobe_tg/models/rgbCMYK.html
[16]Multimedia Systems: Algorithms, Standards, and Industry Practices by Parag, Gerard Medioni
[17]"Handbook of Image and Video Processing" by Alan C. Bovik
[18]David Martin, Charless Fowlkes, and Malik,"Learning to detect natural image boundaries using local brightness, color, and texture cues." IEEE Transactions on PAMI, 26(5):530–549,2004
[19] A study report on AdaBoost algorithm "https://www.cs.princeton.edu/~schapire/papers/explaining-adaboost.pdf ".
[20] A study on RGB and CMYK night color properties http://www.overnightprints.com/difference-between-cmyk-rgb.
[21] Reference on CMYK and RGB color layouts "http://ijair.jctjournals.com/june2012/t12620.pdf".
[22] Handbook of Applied Algorithms: Solving Scientific, Engineering, and Practical Problems Nayak, ISBN: 978-0-470-17564-4 584 pages March 2008.
[23] A reference book on Algorithms for Image Processing and Computer Vision, November 2010.
[24] A refereed journal of SVM algorithms "http://www.stat.purdue.edu/~vishy/papers/VisMur02b.pdf".
[25] A study on color space "http://www.compression.ru/download/articles/color_space/ch03.pdf".
[26] An IJCSI paper on "A Comparison of various edge detection techniques used in image processing" by Dr.C.Chandrashekar.

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