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SVPA - THE SEGMENTATION BASED VISUAL PROCESSING ALGORITHM (SVPA) FOR ILLUSTRATION ENHANCEMENTS IN DIGITAL VIDEO PROCESSING (DVP)

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Abstract

At the present time photographic visual processing is rapidly moving towards the next stage. In addition, a variety of visual processing technologies are evolving, such as splitting image dimensions, calibration, pixel beautification, and high-resolution images. The impact of this digital visual processing technology has now greatly enhanced the opportunities for digital video processing technology and the source of its evolution. The vast industry of converting color images from black and white enables it to present even historical videos of the earlier period in a contemporary manner. In this paper, the segmentation based visual processing algorithm is proposed. The algorithm is designed to enhance resolution and clarity to a certain extent with multi-visual enhanced pixels. It also enhances the contrast, brightness and sharpness enhancement as it is much improved over the previous methods. This algorithm works on each image frame and enhances the overall visual function.

Keywords:

Visual Processing, Visual Processing, Image Dimension, Calibration, Pixel, Segmentation, Resolution, Contrast, Brightness, Sharpness

1. INTRODUCTION

The Digital visual processing is the use of a digital computer to process digital images through an algorithm. As a subdivision or field of digital signal processing, digital visual processing has many advantages over analog visual processing. This allows the use of a much wider range of algorithms for input data and avoids problems such as noise and distortion during processing. Because images are defined in two dimensions (perhaps even more) digital visual processing can be formatted in the form of multi-dimensional systems [1]. The generation and development of digital visual processing is mainly affected by three factors: first, the development of computers; Second, the development of mathematics (especially the development and development of unique mathematical theory); Third, there is a growing demand for a wide range of applications in the environmental, agricultural, military, industrial and medical sciences.

There have been significant advances in fatigue monitoring technology over the past decade. These innovative technological solutions are now commercially available and offer real safety benefits to drivers, operators and other shift workers in all industries [2].

Software developers, engineers and scientists develop fatigue detection software using a variety of physiological references to determine the state of fatigue or dizziness. Measurement of brain function (electroencephalogram) is widely accepted as a standard in fatigue monitoring. Other techniques used to determine fatigue-related impairment include behavioral symptom measurements; Micro corrections for eye behavior, vision direction, steering and throttle application and heart rate variation.

2. RELATED WORKS

Adelson et al [1] calculated the defined image segmentation patterns based on its significance with different volumes of images designed in pyramid schemes. The gray pixels that were important to the image calculated in this way were blurry, resulting in a lower resolution. Although this is true for digital image technology, it does not provide accuracy for visual image processing.

Barghout et al [2] proposed a taxo-metric system. It analyzed image volumes based on the fuzzy method with complex structures. Although the results of this analysis were very accurate, its connection methods were very complex. That is, the combination of the fuzzy method and visual effects greatly affected the work. Its segmentation precision frames had to deal with problems such as making its shots look like they were constantly running and hang at a critical point.

Barghout et al. [4] analyzed some image blocks classified based on visual acuity and attempted to link them to frames. But the momentum of the frames greatly reduced their accuracy. To address these issues.

Bay et al. [5] at its conclusion it was calculated that only a change in the correct position of the frames per second would give a change in its 1 second visual technique. They thus proposed changes to each frame to ensure its correct pixel changes and its replacement work.

Furthermore, Bourdev et al [8] developed a parallel monitoring technique that transcends variations of its visual speed and travels parallel to its speed. Its classifications gave the accuracy of most analytical results. Based on this the resolution of the visual system was changed a lot.

Brox et al [9] expanded its contrast and sharpness modes to further enhance this. Its importance was very much in preparation for their upgrade methods.

3. PROPOSED SYSTEM

The proposed image segmentation based visual processing model was explained in Fig.1. Because capturing an image from the camera is a physical process. Used as a source of sunlight energy. A sensor array is used to capture the image. So, when sunlight falls on an object, the amount of light reflected by that object is sensed by the sensors, and a continuous voltage signal is generated by the amount of data perceived. To create a digital image, you need to convert this data into a digital format [11]. This includes sampling and measurement. (They will be discussed later). The model and measurement results in a two-dimensional sequence or matrix of numbers that is nothing more than a digital image.

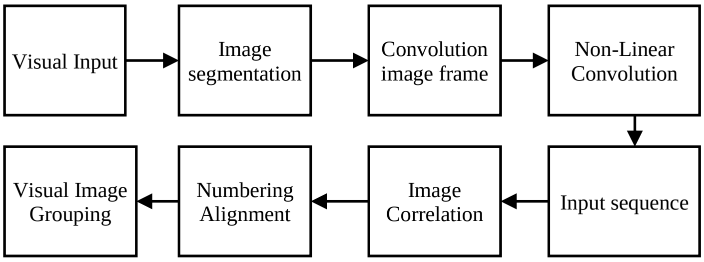

Fig.1. Proposed system design

A digital video processor comes with its own internal hard drive and users can start recording without having to insert any storage media. When it comes to analog camera recording, digital video recording supports features such as remote access motion detection, real-time playback, recording and backup [12]. When it comes to home entertainment, the TV signal goes directly into the digital video processor and is then converted to digital form with the help of the MPEG-2 encoder. From there it is sent to two different targets, one to the hard drive for storage and the other to the TV screen. Newer versions of digital video processor s are capable of simultaneously recording different videos from different channels. Digital video processors have many unique advantages over other methods of video recording. Compared to other similar devices, digital video processor systems are easy to set up and use. They also require less storage space and can provide higher image quality.

The Digital video processors are also quick to recover data and are immune to noise. However, compared to video management software or network video processor s, one digital video processor cannot support multiple cameras on the same computer and can process multiple frames per second [14].

Algorithm 1: SVPA

1. Enter the input visual
2. Convert the visual into the image frames
3. Segment the input images
4. If (input images = order)
5. Then create image matrix with input numerical information
6. Then assign image numbering details
7. Then convolute the input frames
8. Else go to Step 3;
9. If (Non-Linear convolution = success)
10. Then create the output image in sequence manner
11. Then create output image correlation
12. Else go to Step 4;
13. Align the frames as per the number
14. Group the output images in order
15. Convert the frames into visuals
16. End

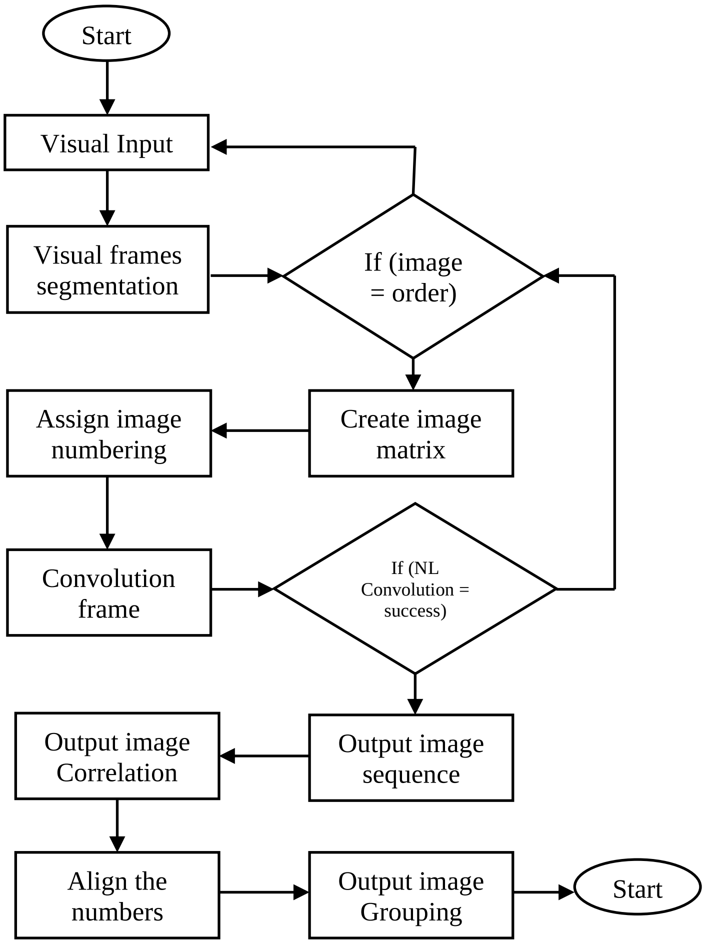

Fig.2. Proposed system block diagram

They do not have the advantage of fringe device processing capabilities with newer systems such as video management software and network video processor [15]. The limited to a small area in visual perception, such a visual detector is responded by,

$$E_v\left(a_0,b_0\right)=\int\int_{-\infty}^{\infty} a_v\left(\gamma,\delta\right)P\left(a_v\left(\gamma-a_0,\delta-a_0\right)\right)d\gamma\cdot d\delta \tag{1}$$

where,

$a_v(\gamma,\delta)$ = imprison axis at (a_0,b_0),

$P(a,b)$ = the subsequent visual image frame;

(a,b) = an Euclidean retina-topic synchronize structure

If it measured a lot of visual decoders merged at (a_0,b_0), then the virtual visual acuity mock-up permits an indoctrination of the concentration at (a_0,b_0) by,

$$P\left(a_0,b_0\right)=\sum_{v=1}^{n}E_v\left(a_0,b_0\right) \tag{2}$$

Then the reaction of visual frame position (a,b) is calculated by,

$$E_v\left(a,b\right)=\int\int_{-\infty}^{\infty} a_v\left(\gamma,\delta\right)P\left(\gamma-a,\delta-a\right)d\gamma\cdot d\delta \tag{3}$$

The initial visual pixel intensity values are encoded, then the Eq.(2) can be written as the follow,

$$P(a,b)=\sum_{v=1}^{n}E_v^{'}(a,b) \quad (4)$$

The visual decoder reaction of the Eq.(3) can be performed by FFT, since the Eq.(3) written as,

$$E_v(\underline{a},b)= F^{-1}\{F(a_v(a,b)*F(P(a,b))\} \quad (5)$$

If two visual frames detected by orthogonal, then their scalar product is 0:

$$a_v*a_u= \sum_\gamma\sum_\delta a_v(\gamma,\delta)*a_u(\gamma,\delta)=0 \quad (6)$$

To use the offline matrix for an image, the image is converted to a matrix in which each entry corresponds to the pixel intensity at that point. The location of each pixel can be specified as a vector, which represents the coordinates of the pixel in the image, $[x,y]$, where x and y are the order and column of a pixel in the image matrix. This allows the integration to be multiplied by an off-transformation matrix, which provides the position that the pixel value will be copied to the output image. However, 3 dimensional homogeneous integrations are required to allow for changes that require translation changes [16]. The third dimension is usually set to a non-zero constant, usually 1, so the new integration is $[x,y = 1]$. This allows the integration vector to be multiplied by a 3×3 matrix, which enables translation changes. So, the standard dimension allows third dimension translation. Since the matrix is a multiplier sub, it is possible to multiply the matrix of each individual change sequence and combine multiple offline transformations into a single offline transformation [17] [18]. Thus, the sequence of affine transformation matrix can be reduced to a single offline transformation matrix. The 2-dimensional coordinates allow only rotation of origin (0, 0). But 3-dimensional identical coordinates can be used to first translate any point (0,0), then rotate, and finally translate the appearance (0, 0) to the original point (opposite to the first translation). These 3 offline transformations can be combined into a single matrix, thus allowing the image to rotate around any point [19].

4. RESULTS AND DISCUSSION

The proposed Segmentation based visual processing algorithm (SVPA) was compared with the existing Visual taxo-metric approach to image segmentation (VTAIS), mutually consistent pose let activations (MCPA), Object segmentation by alignment of pose let activations (OSAPA)

Image segmentation with task specific edge detection (ISTED)

4.1 ENERGY CONSUMPTION FOR VISUAL PROCESSING

The visual process Energy consumption in general varies depending on the amount of energy used on it. That is, measured by multiplying the different number of power units consumed over a period of time. This can be calculated as follows.

$$\text{Energy Consumption } (E) = P*(0.0001t) \quad (7)$$

where,

E = Energy consumption of the equipment

P = Power utilized by the equipment

t = time taken to consume the power.

The Table.1 presents the calculation of energy consumption for visual processing between existing VTAIS, MCPA, OSAPA, ISTED and proposed SVPA

Table.1. Energy Consumption for Visual Processing

Image frames	Energy Consumption (%)				
	VTAIS	MCPA	OSAPA	ISTED	SVPA
2400	71.41	83.34	76.09	88.61	45.45
4800	71.52	83.32	76.26	88.88	45.95
7200	71.54	82.44	75.53	88.58	45.83
9600	68.44	79.61	72.19	85.07	42.6
12000	67.24	78.29	71.46	83.75	42.22
14400	66.63	77.46	70.57	83.21	41.65
16800	66.22	77.06	70.49	82.91	41.95

4.2 POWER CONSUMPTION

The Power required for each device must be fully supplied. Ensuring that such a payment is made is seen as the proper cost to the power generated. Failure to do so will affect the award's performance.

$$P_v= P_{Solar}-(V_{out}*I_{in}) \quad (8)$$

The Table.2 presents the calculation of power consumption for visual processing between existing VTAIS, MCPA, OSAPA, ISTED and proposed SVPA

Table.2. Power consumption for Visual Processing

Image frames	Power Consumption (%)				
	VTAIS	MCPA	OSAPA	ISTED	SVPA
2400	70.03	83.81	73.74	85.42	36.61
4800	68.4	82.07	72.16	84.27	35.32
7200	67.92	79.73	69.96	82.74	34.31
9600	66.63	78.92	68.33	80.75	33.42
12000	64.52	76.63	67.19	78.28	33.05
14400	63.03	74.17	64.99	76.84	31.41
16800	61.22	72.97	63.84	75.12	31.04

4.3 IMPROVEMENT OF RESOLUTION

In general, input recognition is the process of effectively managing the excess information in a database. Due to its efficient use only the authorized data present in the database is used. Authorized data unnecessary data will not be allowed to enter. Thus, the blocking storage of the unauthorized data was restricted. Most storage space is handled efficiently if unwanted data is not stored.

Then, the unauthorized data blocking of a system is given by:

$$\text{Input Recognition} = \sum_{a=1}^{h} I_j \quad (9)$$

where, I_j is dented here the total number of input commands entered the system

The Table.3 presents the calculation of resolution improvement for visual processing between existing VTAIS, MCPA, OSAPA, ISTED and proposed SVPA

Table.3. Visual Resolution Improvement

Image frames	Visual Resolution (%)				
	VTAIS	MCPA	OSAPA	ISTED	SVPA
2400	76.49	84.14	85.07	92.46	96.45
4800	76.6	84.12	85.24	92.73	96.95
7200	76.62	83.24	84.51	92.43	96.83
9600	73.52	80.41	81.17	88.92	93.6
12000	72.32	79.09	80.44	87.6	93.22
14400	71.71	78.26	79.55	87.06	92.65
16800	71.3	77.86	79.47	86.76	92.95

4.4 REJECTION OF IMAGE FRAMES

The input rejection management is the efficient handling of excess data provided. That is, how to quickly take action on information through artificial intelligence and implement it immediately. To the extent that it has its potential the results will be correct. Also, some data that was too much of the data given at the specified time may not even is processed. Thus, artificial intelligence management calculates how much data is left. The efficiency calculation of this method refers to the fact that less data is not executed at that particular time.

Input rejection $x(t)$ = (dropped instructions under the active production (x,t))/(non block instructions arrivals under production time (x,t)) (10)

The Table.4 presents the calculation of image frames rejection for visual processing between existing VTAIS, MCPA, OSAPA, ISTED and proposed SVPA

Table.4. Visual Image Rejection

Image frames	Visual Image Rejection (%)				
	VTAIS	MCPA	OSAPA	ISTED	SVPA
2400	23.51	15.86	14.93	7.54	3.55
4800	23.4	15.88	14.76	7.27	3.05
7200	23.38	16.76	15.49	7.57	3.17
9600	26.48	19.59	18.83	11.08	6.4
12000	27.68	20.91	19.56	12.4	6.78
14400	28.29	21.74	20.45	12.94	7.35
16800	28.7	22.14	20.53	13.24	7.05

4.5 ENERGY EFFICIENCY

Energy efficiency is the ratio between the performed output energy and the given input energy. Once the efficiency was increased then the given equipments utilized the maximum given energy. Hence the system and equipments are performed well.

$$\sigma = (E_{Out}/E_{in}) * 100 \quad (11)$$

where,

σ = Energy efficiency of the system

E_{Out} = Output energy utilization in Joules

E_{in} = Input energy utilization in Joules

The Table.5 presents the calculation of energy efficiency for visual processing between existing VTAIS, MCPA, OSAPA, ISTED and proposed SVPA

Table.5. Energy Efficiency for Visual Processing

Image frames	Energy Efficiency (%)				
	VTAIS	MCPA	OSAPA	ISTED	SVPA
2400	78.76	76.94	79.64	80.38	94.74
4800	78.65	76.96	79.47	80.11	94.24
7200	78.63	77.84	80.2	80.41	94.36
9600	81.73	80.67	83.54	83.92	97.59
12000	82.93	81.99	84.27	85.24	97.97
14400	83.54	82.82	85.16	85.78	98.54
16800	83.95	83.22	85.24	86.08	98.24

5. CONCLUSION

The developments of visual-assisted diagnostic methods that help clinicians interpret images of X-rays, MRIs, etc., and then highlight the clear area to be examined by the physician. In the physical world (3D world) the amount of light reflected by an object passes through the lens of the camera and converts it into a 2D signal, thus forming the image. This image is then digitized using signal processing methods and then this image is handled in digital image processing. Technological advancement in all fields in general has further enhanced the visual processing work currently due to its development. But to expand it requires specially proposed algorithms that are commensurate with its speed. This was improving its accuracy. But most of the proposed algorithms consume more energy and power at a given speed while its work is limited to a limited time. This provides high accuracy but only for a limited amount of time. But the currently proposed algorithm gets lower energy consumption and higher energy efficiency. Also, its power utilization is low so it can be used for a long time. Also, the image frame blocks given as input are more and the rejecting frames are less so that all the visual effects can be ensured to be accurate.

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