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Novel Method of Predicting Video Analyzer

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Abstract: *Video analysis is the time consuming process, the paper study on find Bit rate, FPS (Frame per Second), color value and size of the video. It also explained Digital 3DVideo analysis, real-time measurement methods, general functionalities of the videos and its algorithms and available video analyzer tools. The novel method focused on the video analyzer development logics and its related program and real-time analytics of any video.*

Keywords: *video analysis; video quality analysis; algorithms; methods;*

I. Introduction

All kind of the products testing is the best way to find that quality. The software testing approach for video analyzer is uses the functional testing method. The simplest representation of digital video is a sequence of frames, each consisting of a rectangular grid of picture elements, or pixels [8]. This method analyzes video files using software testing methods. The video analysis contain the following functionalities, video type(codec), size of the video file, duration of the video, Bit rate and frame per second. The paper presents the functionalities of the video file and concepts in video quality analysis. Getting process information's from selected video file is called Video Analysis. The process of video file can be categorized in five areas: Acquisitions, Extraction, Analysis, Representation and Recognition [1].

In this paper we focused on analyze video files. The video analysis portioned by two important components color appearance and visual motion, When analyzing a video file it creates one Frame Descriptor for each frame, or a Shot Descriptor for continuous sequences of frames. Descriptors are lightweight data structures for hold analysis results of a given video unit and analysis results are reused [1].

Types of descriptors are Frame Descriptors, Shot Descriptors, and Region Descriptors. Generally the test characteristics are classified by four, Decoder Analysis, Video Analysis, Audio Analysis, Reference test possible.

II. FUNCTIONALITIES OF VIDEOS

Video can be obtained by camera or create artificially. The technology generates audio and image get digital. Generally coding and algorithms are applied to compress the data, mostly make one more modification on the original content and store coded information for future use. The opposite process is, decoding the video and extracting frames and audio information's. The decoded frames are main working unit in video analysis.

The effective and live analysis is, working with small windows of frames. The analysis process consist more than one algorithm for find video image and audio in formations. The algorithm results are stored in temporal memory structures this process is called by representation. In order to recognition these process, the video files are stored and taken at input and algorithm try to detect set of properties in the sequences which are interpreted as events. In this case there is many challenges in video analysis. Analyze video quality, address three main components, Picture Quality, Audio Quality, and Audiovisual (Multimedia) Quality [5].

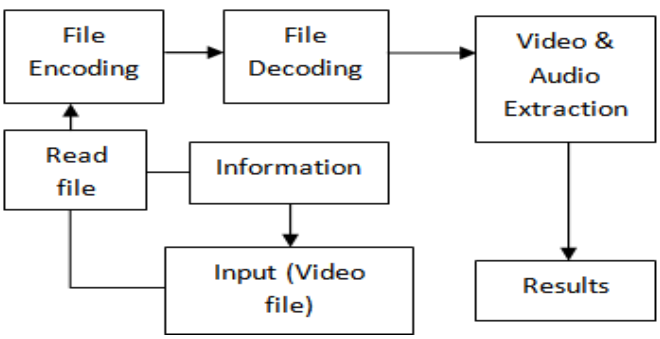

Figure 1: functionality's of video analyzer

The basic Functionality of video analyzer is diagrammatically represented below: Analyzer read an input video file from Information (knowledge base) and makes the video file Encoding and Decoding process, finally extract the information's from the particular video file and provide the results. The result contain, type of the video file, frame per second etc.,

III. Applied Coding For Analyzing Video Files

They lead approaches for analyze video files, Motion tracking method it's based on removal of motion layer objects. Stroke surfaces method describes the image segmentation in each frame, with region matching between frames. The greedy algorithm quickly matches regions between frames quickly, and combines motion tracking and simple user interaction to improve the results this approaches are generally have long-run times and it can be sensitive to the speed of the object's motion and to variations in the object shape, color, and lighting, since this is a global approach. The third approach is based on both color and motion information. Segmentation algorithm is a universal method suitable for all kinds of videos [6]

The foremost step of video analysis is read a particular video file, the reader declare the input file (file type), declare the frame number and assigns the pointer to video reader [1].Get the RGB values of the first frame (f=0) from which we can access video data. Temporal information, TI(i,j,n) describes the difference (movements) between two adjacent frames, Y(i,j,n-1) and Y(i, j, n). TI (i, j, n) as defined in,

TI (i, j, n) = Y (i, j, n) - Y (i, j, n-1)

we can interpret quality parameters based on temporal information as indicating added or lost motion in the estimation scene compared to the source scene, n denotes the frame number, (i, j) a specific pixel and Y(n) the luminance(brightness) component of the n^{th} video frame. Python Standard Library [5] contains Multimedia Modules, it included that for find frame rate, video type and video player functions. The winsound module allows playing sound on your windows machine. The colorsys module converts between RGB, YIQ (video), HLS, and HSV color values. Method for find the frame rate, getframerate () and the bytes per frame, bytes per second codes are given below:

```
bytes_per_frame                =
sound.getsampwidth      ()     *
sound.getnchannels ()
bytes_per_second               =
```

colorsys.rgb_to_yiq(r, g, b), colorsys.yiq_to_rgb(y, i, q) and colorsys.hls_to_rgb(h, l, s), colorsys.hsv_to_rgb(h, s, v) is a method for find RGB, YIQ, HLS, HSV values in the selected video file. The results from the sample video file frame rate is, 44100 Hz sampling rate, RGB value is(1.0, 0.84, 0.0),YIQ is (0.7956, 0.3648, -0.2268) => (0.9999998292, 0.8400000312, 0.0).HLS and HSV values are, HLS (0.14, 0.5, 1.0) => (1.0, 0.84, 0.0), HSV (0.14, 1.0, 1.0) => (1.0, 0.84, 0.0).

IV. Algorithms For Analyzing Video Files

The algorithms need for get video description. The Short term algorithms calculate individual frame histograms, these histograms useful for segment description. Histogram is a type of graph that shows the distribution of frequencies of data. Recognition algorithm used for analyses and extract present information, the featured described from an initial video have to be detected in other videos. Signature finding algorithms for find commercials detections. In this algorithm the information set the signature is extracted from video fragment. Descriptors define a family of Interchangeable algorithms for follow strategy design pattern [1]. Zero reference algorithm, partial reference algorithm, and Full reference algorithm these algorithms are used for find video quality from objective test data [4]. The Zero reference algorithm, analyze only output stream. Media-stream-based algorithms which analyze the video quality this expressed as quality. Media-stream-based algorithm includes, Per-frame quality computation calculates for find the quality in each frame using the frame type, frame size, codec type. Partial reference algorithm or reduced reference algorithms for compare input and output stream parameters. The main purposes of using this Full reference algorithm for find detailed comparison between input, output and data stream.

V. 3D Analysis

Video frame generation it compose three regions [2], vertical blanking region, horizontal blanking region, and active picture region. The vertical blanking region includes the vertical sync pulse that denotes a new frame, and the horizontal blanking region includes a sync pulse that denotes a new line inside the frame.

The Vendor-Specific Info Frame specifies the frame rate and resolution of the video signal, which defines the timing of the horizontal and vertical sync pulses. The active picture region specifies, location of pixels that user view on the display. The pixel color values are stored in three channels, that's RGB or YUV or YPbPr if it's encoded The color range from 8 to 12 bits per channel, it mean by each pixel has a 24- to 36-bit color value. A Full High-Definition (HD) 1080p/60 Hz video stream has a vertical blanking pulse every 16.67 ms (60 Hz) to signify a new frame and a horizontal blanking pulse every 14.8 μs to signify a new horizontal line. Within the 14.8 μs horizontal line duration there are 2,200 pixels, which include the horizontal blanking period and the active picture. This requires a pixel clock of 148.5 MHz (1/14.8 μs horizontal line duration*2,200 pixels)

VI. Measurements For Test Video Files

When we measure the quality of a video file, the methods of quality assessment is categorized by two, subjective assessment (which uses human viewers) and objective assessment (which uses electrical measurements) [3]. The viewer is first shown the original video for N seconds followed by M seconds (N > M) of gray and then again N seconds of the degraded video. The original video and the degraded video are digitized and processed to extract a large number of features. The processing may include Sobel filtering, Laplace filtering, fast Fourier transforms, first-order differencing, color distortion measurements, and moment calculations.

The difference between original video and degraded video is based on 5 important scales.

1. Imperceptible,
2. Perceptible but Not Annoying,
3. Slightly Annoying,
4. Annoying,
5. Very Annoying.

Objective measurement of video quality during the use of static video test scenes such as resolution charts, color bars, multi-burst patterns, and so on, and by measuring the signal to noise ratio of the video signal. The difference between objective and subjective measurement is variation of original and distorted sequences. It's very complicated test, based on mathematical calculations and Human Vision System (HVS) models. The video contents are stored in various time periods of the video signal, it provide basic measurements [2] to test quality of the contents in video. The measurements evaluate the video signals based on timing, level, and linearity. The time parameter measure the horizontal and vertical blanking intervals and its most essential parameter is horizontal sync amplitude, width and Vertical sync amplitude, width, start and end of the active video, horizontal time line.

The level based measurements test active pictures image quality and packaged contents. For this content level testing we used color bar test pattern, so that we test the channels minimum and maximum values. The noise and linearity measurement uses ramp pattern this for test and identify noise on the channel. This linearity measurement is the most complex, it characterized video quality and it test minimum bit error on the least significant bit (LSB) of each channel.

VII. Video Analyzer Tools

Digital Video Quality Analyzer (DVQ), is a tool for analyze video file, its functionalities are, Real-time measurement, Program decoding, Recording of quality profile (long-term), SSCQE scaling of quality levels, Histogram representation of quality levels, Internal event and error report and statistics, Monitoring of picture freeze, picture loss and sound loss. ARINC 818 Analyzer, is a analyzer , it provide detailed analysis of stream timing and it provide Automatic error checking. Video Analyzer UAF, is a tool , the functionalities are Ease of operation, 3 signal inputs, 25 video parameters, Limit monitoring, Full-field measurements, Convenient result display, Freely selectable test signal, Memory card, Printer interface, Remote control, (IEC/IEEE bus), Small dimensions.

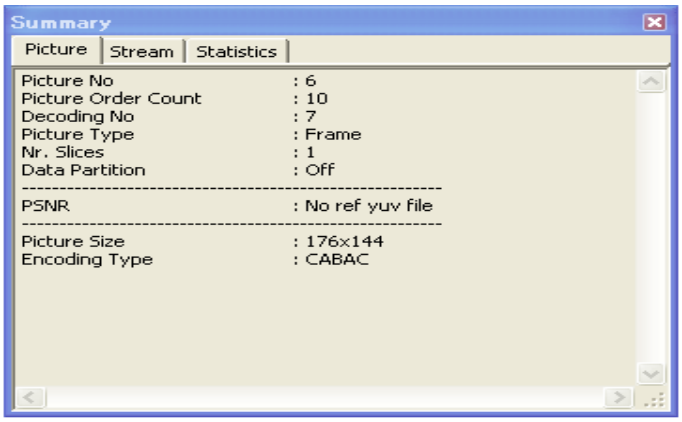

Figure: 3 Stream Summary Info

Codec Visa is a video analyzer tool for professionals and researchers. It provides users with a unique visual representation of the encoded video features and stream structure analysis. Tool presents picture information, stream summary information, provides the unique feature of displaying those intermediate picture reconstructed in different decoding stages supported stages are:

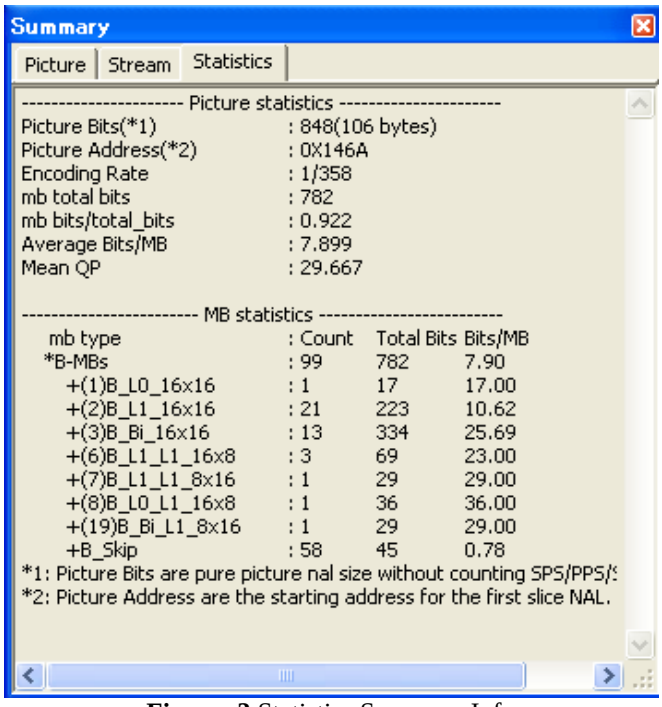

Figure: 3 Statistics Summary Info

Finally Decoded Picture,_ Picture before Deblocking Filter, Predicted Picture, and Residual Picture(with visual enhancement). Also it provides Original Reference YUV Picture, Difference between Finally Decoded Picture and Reference YUV Picture. Here are some screen shots of this feature on the same decoded frame.

Tool exports some stream parameters as well as some statistics info based on them into Summary Dialog for convenience. Tool also support Histogram, on frame basis for video quality enhancement. The screen short is given in figure4. PEVQ Video Analyzer, is a tool for Perceptual Video quality of Experience measurement. Its key features are, **Full reference based end-to-end quality analysis, Accurate, reliable and fast objective analysis of perceived video quality and Additional KPIs** (key performance indicators)**for detailed analysis.**

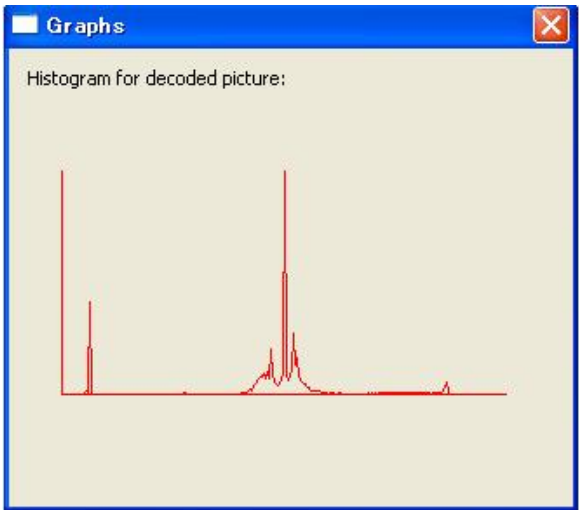

Figure: 4 Histogram Graph

VIII. Conclusion And Future Work

This article illustrates the Functionalities and Measurement of video files, algorithms for find videos quality. Using Python Standard Library we get information's from sample video file. List of algorithms for find video quality and Presents Measurements for test video files are evaluated. Video analyzer consist more functionalities, this article find basic bit rate, frame count and color values only. It's necessary to find other important concepts are, Type of file (codec), Stream type, Matroska (delay between audio and video calculation), deducts the additional formats (Module, Extended module, Impulse Tracker, Scream Tracker). 3D video technology provides great challenges in Multimedia Device Testing [2].

Reference

[1]. Pablo Flores, Federico Lecumberry, Pablo Arias, Alvaro Pardo, Video Analysis Platform. gmm@fing.edu.uy, http://iie.fing.edu.uy/vap.
[2]. http://zone.ni.com/devzone/cda/pub/p/id/1078
[3]. http://www.eetimes.com/electronics-news/4196911/Performance-Analysis-for-Objective-Methods-of-Video-Quality-Assessment
[4]. Telchemy, Application Note. Understanding IP Video Quality Metrics. February 2008.
[5]. Guido van Rossum, Python Standard Library: Multimedia Modules. Python Imaging Library (PIL)
[6]. ZHANG Songhai, ZHANG Yifei, CHEN Tao, Video Structure Analysis. TSINGHUA SCIENCE AND TECHNOLOGY, ISSN 1007-0214 14/20 pp714-718, Volume 12, Number 6, December 2007
[7]. http://authors.phptr.com/tanenbaumcn4/samples/section07_04.pdf. Pp 119-123