



Tools for Video Analysis



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Choosing the Best Video Processing and Compression Algorithms

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Introduction

Video processing and compression algorithms change the characteristics of the original program in the quest of reducing the bandwidth needed to send the programming information to the home.

The art is to do this without allowing the audience to perceive a change in video quality. Successful video processing and compression algorithms perform the desired modifications while presenting a result to the viewer that, subjectively, looks natural and realistic. This sounds difficult, but it is necessary to send many channels of high-quality programming.

Each broadcaster – traditional or web caster - must deal with rapidly changing varieties of programming, new video processing algorithms, and new compression algorithms.

Problem Statement

To understand why this is so important, we must take a look at how much data is required to send video programming to the home.

The original source data for standard definition television, which has been around for over 80 years, once converted to digital requires 270Mbps. To put this in perspective, high speed Internet access is between 2-10Mbps. To compound matters, High Definition, which is all the rage, requires 6 times more data. Many video processing and compression companies continuously invent sophisticated ways to reduce the huge bandwidth requirements to manageable levels.

How can broadcasters know if a new algorithm is better than their current choice?

Traditionally, broadcasters invite the various video processing and compression companies into their R&D facilities, and perform side-by-side tests also known as a bake-off. Each vendor starts with the same source material, and does their best job to reduce the bandwidth while keeping the video quality high.

The broadcaster then shows the results to a group of experts and asks them, which one is the best. The results are tallied, weighted based on reliability and price, and the winner is chosen.



Previous Options

The test setup usually consists of source video programming stored on a VTR or a light-compressed video server. The source video is sent to the various video processing and compression systems. The results are sent to a decoder (STB), which shows the processed video on a TV. The original source video is echoed to another TV. The expert viewers are then asked for their opinions.

Video Clarity Solution

The ClearView Video Analysis system captures the original source material and stores it as completely uncompressed source material. It then streams the output to the various video processing and compression systems, and captures their IP results or the results of the decoder. ClearView stores the processed video sequence as uncompressed resultant material at the same resolution and image format as the original source material. ClearView presents both video sequences to 1 display - side-by-side, mirrored, and seamless split – and allows the operator to play the video sequences at any speed with zoom & pan capabilities to the expert viewers. While displaying the 2 video sequences, ClearView applies objective metrics and graphs the differences along with the pixel differences. One ClearView system coordinates the subjective viewing; while performing objective metrics.

Benefits

- Repeatable tests, quantitative results, and a streamlined setup.
- Analyze 2, 1080P video sequences in real-time
- ClearView does not alter the original video sequences - video sequences are processed completely uncompressed.
- Multiple viewing modes are presented on 1 display – no need to calibrate 2 separate Television displays to compare video sequences.

Implementation

ClearView takes advantage of the high-reliability of today's off-the-shelf computer platforms. This ensures that products are made with the latest and greatest hardware available, while at the same time avoiding the high cost of custom designs. ClearView is packages in a 4U, 20" deep Industrial Chassis.

Summary

The ClearView Video Analysis System provides broadcasters, video researchers, compression developers with the unique ability to capture, play-out, and interactively analyze 100% uncompressed digital video.

For more information, please visit our website at www.videoclarity.com.