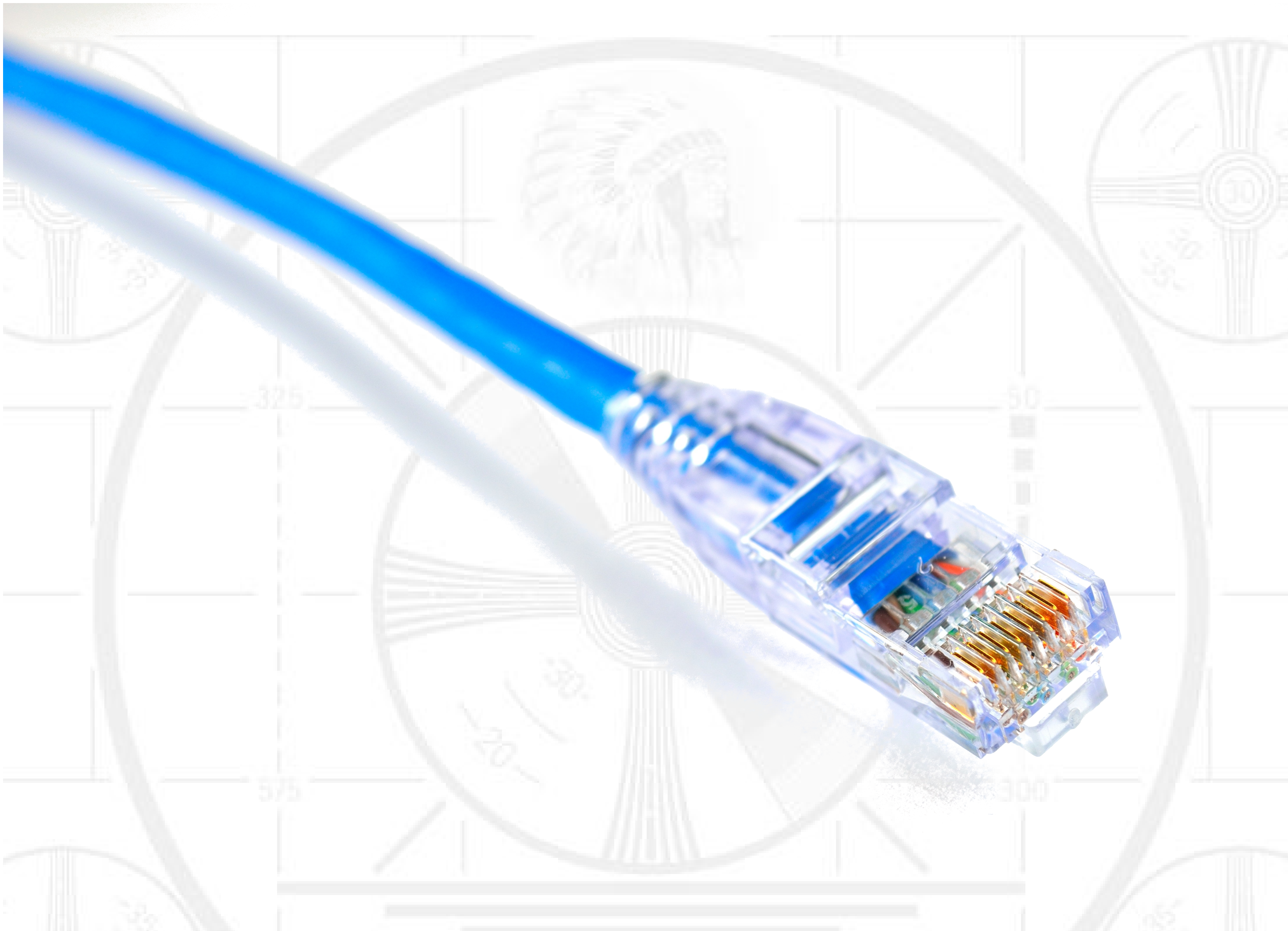
The Media Streaming Journal

June 2016



Covering Audio and Video Internet Broadcasting

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Welcome to The Media Streaming Journal

Greetings,

Internet multimedia in the United States is taking another big hit. Taylor Swift, fellow recording artists, record industry organizations and record labels have signed a petition to have Congress review regulations dealing with Internet multimedia distribution.

They advocate the review of legislation dealing with multimedia content distribution (The Digital Millennium Copyright Act), specifically The Online Copyright Infringement Liability Limitation Act (OCILLA) or safe harbor clause as well as increasing compensation for multimedia content distribution.

The Online Copyright Infringement Liability Limitation Act (OCILLA) creates a conditional safe harbor for online service providers and other Internet intermediaries. Through the safe harbor clause, these institutions cannot be held liable for copyright infringement based upon their own acts of direct copyright infringement in addition to shielding them from potential secondary liability for the infringing acts of others. (https://en.wikipedia.org/wiki/Online_Copyright_Infringement_Liability_Limitation_Act)

The record industry has repeatedly shown their disdain for multimedia content providers. This response is due to their inability to control every aspect of it, and they will continue to leave no stone unturned.

What nefarious step will the record industry take next? Only time will tell ...

Please feel free to contact either the Publication Director (Derek Bullard) or myself if you have any questions or comments regarding The Media Streaming Journal.

Namaste

David Childers

The Grand Master of Digital Disaster
(Editor In Chief)

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The Media Streaming Journal

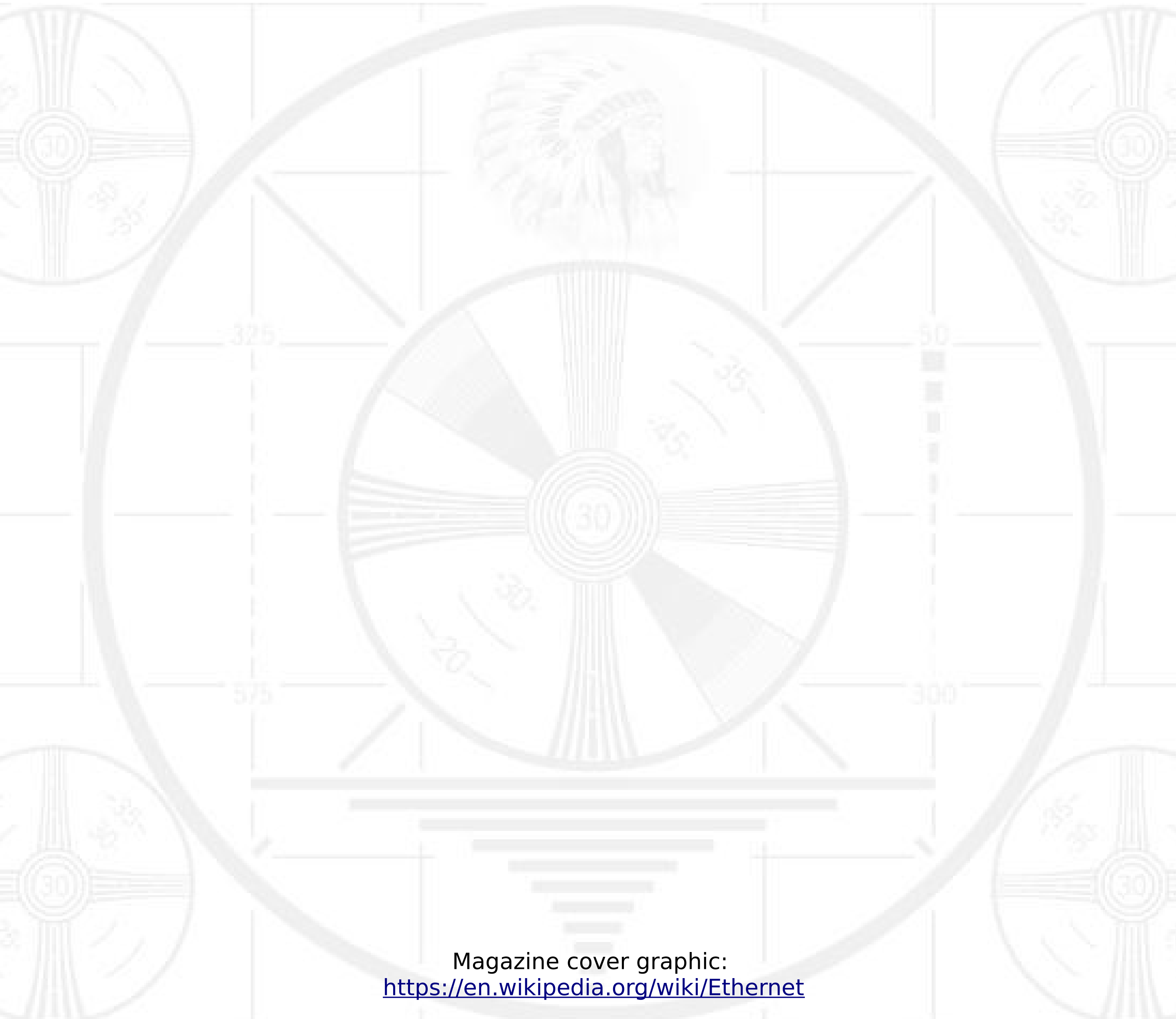
What is in this edition of the Media Streaming Journal

Website Statistics

Multimedia Data Compression

Social Network Advertising

Scientific Linux



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Our Mission

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Website Statistics

Website statistics provide a wide variety of information regarding visitor traffic. This information can be used for adjusting content or planning website promotion. This information can also be used as a means to measure the effectiveness of any changes in website content or promotion.

Measuring website activity typically requires the insertion of special HTML code into each web page. A server based application then gathers and records this information. You have the option of using a free service such as Google Analytic's or one of several paid website statistic services.

The following website statistic metrics should be considered important and tracked carefully:

<u>Visitor Numbers</u>

- First time visitor.
- Returning visitor.

Both metrics should have an upward trend.

<u>Visitor Information</u>

- Geographic location of the visitor.
- Time of visit.
- Visitor language.
- Day of visit.

This information can be used for historical data comparison.

<u>Traffic Sources</u>

- Direct traffic.
- Referral traffic (Websites that provide HTML links to your website.)
  - Industry.
  - Non-industry.
  - Personal.
- Social traffic.
  - Tumblr.
  - Facebook.
  - Twitter.
- Search engine traffic.
  - Google.
  - Bing.
  - Yahoo.
- Paid traffic.
  - AdWords advertising.
  - Banner advertising.
  - Link advertising.

There should have a mix of inbound traffic. Inbound traffic from one single source indicates that more attention should be paid to acquiring traffic from multiple sources.

<u>Visitor Interaction</u>

- Number of individual web pages viewed.
- Average time spent on individual web pages.

Both metrics should have a large number.

<u>Website Access Devices</u>

- Mobile.
- Desktop.

Ensure that the website is mobile device compliant if you have a low metric for mobile devices.

Heatmap - What portions of a web page attracts the most visitor attention.

Web page heat mapping requires special addons.

Bounce Rate - How many visitors depart a website immediately after arriving.

This metric should be very low.

Individual Web page Information

- Entry page – Web pages that visitors arrive on when reaching the website
- Exit page – Web pages that visitors depart the website from.
- Top pages - Web pages that visitors access the most.

This metric can be used to adjust marketing or adjusting website content.

Conversion Goal - How many visitors achieved a specific goal?

- Sale of a product.
- Subscription to a newsletter.
- Share website content through social media platforms.

Conversion goals are a must and should be carefully tracked. This metric should be high.

Value Rate - Conversion rate divided by the total number of visitors traffic.

This metric should be very high.

Cost Rate - Cost per conversion. Total advertising / marketing dollars divided by the total number of visitor conversions.

This metric should be very low.

Bots - Who or what crawls / index's the website.

This information can be useful to ascertain which search engines or entities have shown interest in cataloging the website.

Monitor Website For Internal Structural Errors - Fix problems as they arise.

- Errors can deter people from continuing to access the website.

Monitor Website For Uptime - Fix downtime as it occurs.

- Downtime can deter people from continuing to access the website.
    - Consider using a Content Distribution Network to alleviate content delivery problems.

Page Load Timing - Maximize fast web page load time.

- Poor load time can affect people accessing your website from around the world. Slow loading pages can deter people from continuing to access the website.

Response Timing - Minimize server response time.

- This is indicative of the web server operation itself.

  - Poorly maintained web servers or web providers that over saturate available bandwidth create problems for content delivery.

  - You get what you pay for. Seek out the best possible web host.

Content Quality - Maximize content quality.

- Poor quality content can reflect negatively on the website and can deter people from continuing to access the website.

Content Is Typically Judged By Several Factors:

- Poor spelling.
- Poor grammar.
- Not relevant or focused.

Call To Action – This must be effectively used to entice people to continue accessing the website or complete a conversion goal.

- Buy our latest book on HTML and you too can become a world class expert.
- Click here and continue your journey on our amazing website.
- Subscribe to our information packed newsletter by filling out this form.

Search Engine Visibility - Maximize website content to focus on specific keywords and concepts to attract the target audience.

Key Things To Remember

- Who is the desired audience for the website?
- What is the purpose of the website?
- Why should a visitor go to the website?
- Does the content appeal to the desired audience?
- Are the keywords used relevant to the target audience?
- Are the keywords used relevant to the purpose of the website?

Free Online Services

The following are free online services that will allow you to test the performance of your website.

Measure Web Page Load Time

http://www.gtmetrix.com/

http://www.monitis.com/pageload/

Check How A Website Will Appear On A Mobile Devices

http://www.mobilephoneemulator.com/

http://www.ready.mobi/

Check Website For Cross Browser Compatibility

http://www.browserstack.com/screenshots

http://www.browsershots.org/

http://www.browserling.com/

all-free-download.com/free-vector/download/magnifying_glass_clip_art_23181.html

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Relax With The Sights And Sounds Of Nature

Scenic Television

Your Window To The World

Scenic Television is an Internet television station that presents the sights and sounds of nature 24 hours a day. Let us soothe and relax you wherever you are. Savor the tropical beaches of Puerto Rico or relax at a rain forest in Costa Rica. Meditate at the Danube River in Germany, or relish the view of Lake Zurich in Switzerland. We have scenic videos from locations all over the world.

Scenic Television originates from the Gulf coast of South Alabama and broadcasts to a global audience. The television broadcast is accessible on any device with an Internet connection. Such electronic devices include desktop computers, laptops, tablets, smartphones, game platforms, and Internet-connected televisions.

http://television.scenicradio.com

Multimedia Data Compression

Data compression involves encoding information using fewer bits than the original representation. Compression can be either lossy or lossless. Lossless compression reduces bits by identifying and eliminating statistical redundancy. No information is lost in lossless compression. Lossy compression reduces bits by identifying unnecessary information and removing it. The process of reducing the size of a data file is referred to as data compression. In the context of data transmission, it is called source coding (encoding is done at the source of the data before it is stored or transmitted) in opposition to channel coding.

Compression is useful because it helps reduce resource usages, such as data storage space or transmission capacity. Because compressed data must be decompressed to use, this extra processing imposes computational or other costs through decompression; this situation is far from being a free lunch. Data compression is subject to a space–time complexity trade-off. For instance, a compression scheme for video may require expensive hardware for the video to be decompressed fast enough to be viewed as it is being decompressed, and the option to decompress the video in full before watching it may be inconvenient or require additional storage. The design of data compression schemes involves trade-offs among various factors, including the degree of compression, the amount of distortion introduced (when using lossy data compression), and the computational resources required to compress and decompress the data.

Lossless

Lossless data compression algorithms usually exploit statistical redundancy to represent data without losing any information, so that the process is reversible. Lossless compression is possible because most real-world data exhibits statistical redundancy. For example, an image may have areas of color that do not change over several pixels; instead of coding "red pixel, red pixel, ..." the data may be encoded as "279 red pixels". This is a basic example of run-length encoding; there are many schemes to reduce file size by eliminating redundancy.

The Lempel–Ziv (LZ) compression methods are among the most popular algorithms for lossless storage. DEFLATE is a variation on LZ optimized for decompression speed and compression ratio, but compression can be slow. DEFLATE is used in PKZIP, Gzip, and PNG. LZW (Lempel–Ziv–Welch) is used in GIF images. Also noteworthy is the LZR (Lempel-Ziv–Renau) algorithm, which serves as the basis for the Zip method.[citation Needed] LZ methods use a table-based compression model where table entries are substituted for repeated strings of data. For most LZ methods, this table is generated dynamically from earlier data in the input. The table itself is often Huffman encoded (e.g. SHRI, LZX). Current LZ-based coding schemes that perform well are Brotli and LZX. LZX is used in Microsoft's CAB format.

The best modern lossless compressors use probabilistic models, such as prediction by partial matching. The Burrows–Wheeler transform can also be viewed as an indirect form of statistical modeling.

In a further refinement of the direct use of probabilistic modeling, statistical estimates can be coupled to an algorithm called arithmetic coding. Arithmetic coding is a more modern coding technique that uses the mathematical calculations of a finite-state machine to produce a string of encoded bits from a series of input data symbols. It can achieve superior compression to other techniques such as the better-known Huffman algorithm. It uses an internal memory state to avoid the need to perform a one-to-one mapping of individual input symbols to distinct representations that use an integer number of bits, and it clears out the internal memory only after encoding the entire string of data symbols. Arithmetic coding applies especially well to adaptive data compression tasks where the statistics vary and are context-dependent, as it can be easily coupled with an adaptive model of the probability distribution of the input data. An early example of the use of arithmetic coding was its use as an optional (but not widely used) feature of the JPEG image coding standard. It has since been applied in various other designs including H.264/MPEG-4 AVC and HEVC for video coding.

Lossy

Lossy data compression is the converse of lossless data compression. In these schemes, some loss of information is acceptable. Dropping nonessential detail from the data source can save storage space.

Lossy data compression schemes are designed by research on how people perceive the data in question. For example, the human eye is more sensitive to subtle variations in luminance than it is to the variations in color. JPEG image compression works in part by rounding off nonessential bits of information.[9] There is a corresponding trade-off between preserving information and reducing size. Several popular compression formats exploit these perceptual differences, including those used in music files, images, and video.

Lossy image compression can be used in digital cameras, to increase storage capacities with minimal degradation of picture quality. Similarly, DVDs use the lossy MPEG-2 video coding format for video compression.

In lossy audio compression, methods of psychoacoustics are used to remove non-audible (or less audible) components of the audio signal. Compression of human speech is often performed with even more specialized techniques; speech coding, or voice coding, is sometimes distinguished as a separate discipline from audio compression. Different audio and speech compression standards are listed under audio coding formats. Voice compression is used in internet telephony, for example, audio compression is used for CD ripping and is decoded by the audio players.

Theory

The theoretical background of compression is provided by information theory (which is closely related to algorithmic information theory) for lossless compression and rate–distortion theory for lossy compression. These areas of study were essentially forged by Claude Shannon, who published fundamental papers on the topic in the late 1940s and early 1950s. Coding theory is also related to this. The idea of data compression is also deeply connected with statistical inference.

Machine learning

There is a close connection between machine learning and compression: a system that predicts the posterior probabilities of a sequence given its entire history can be used for optimal data compression (by using arithmetic coding on the output distribution) while an optimal compressor can be used for prediction (by finding the symbol that compresses best, given the previous history). This equivalence has been used as a justification for using data compression as a benchmark for "general intelligence."

Data differencing

Data compression can be viewed as a special case of data differencing: Data differencing consists of producing a difference given a source and a target, with patching producing a target given a source and a difference, while data compression consists of producing a compressed file given a target, and decompression consists of producing a target given only a compressed file. Thus, one can consider data compression as data differencing with empty source data, the compressed file corresponding to a "difference from nothing." This is the same as considering absolute entropy (corresponding to data compression) as a special case of relative entropy (corresponding to data differencing) with no initial data.

When one wishes to emphasize the connection, one may use the term differential compression to refer to data differencing.

Uses

Audio data compression has the potential to reduce the transmission bandwidth and storage requirements of audio data. This should not be confused with dynamic range compression. Audio compression algorithms are implemented in software as audio codecs. Lossy audio compression algorithms provide higher compression at the cost of fidelity and are used in numerous audio applications. These algorithms almost all rely on psychoacoustics to eliminate less audible or meaningful sounds, thereby reducing the space required to store or transmit them.

In both lossy and lossless compression, information redundancy is reduced, using methods such as coding, pattern recognition, and linear prediction to reduce the amount of information used to represent the uncompressed data.

The acceptable trade-off between loss of audio quality and transmission or storage size depends on the application. For example, one 640MB compact disc (CD) holds approximately one hour of uncompressed high fidelity music, less than 2 hours of music compressed losslessly, or 7 hours of music compressed in the MP3 format at a medium bit rate. A digital sound recorder can typically store around 200 hours of clearly intelligible speech in 640MB.

Lossless audio compression produces a representation of digital data that decompress to an exact digital duplicate of the original audio stream, unlike playback from lossy compression techniques such as Vorbis and MP3. Compression ratios are around 50–60% of original size, which is similar to those for generic lossless data compression. Lossless compression is unable to attain high compression ratios due to the complexity of waveforms and the rapid changes in sound forms. Codecs like FLAC, Shorten and TTA use linear prediction to estimate the spectrum of the signal. Many of these algorithms use convolution with the filter [-1 1] to slightly whiten or flatten the spectrum, thereby allowing traditional lossless compression to work more efficiently. The process is reversed upon decompression.

When audio files are to be processed, either by further compression or for editing, it is desirable to work from an unchanged original (uncompressed or losslessly compressed). Processing of a lossily compressed file for some purpose usually produces a final result inferior to the creation of the same compressed file from an uncompressed original. In addition to sound editing or mixing, lossless audio compression is often used for archival storage, or as master copies.

There are several lossless audio compression formats that currently exist. Shorten was an early lossless format. Newer ones include Free Lossless Audio Codec (FLAC), Apple's Apple Lossless (ALAC), MPEG-4 ALS, Microsoft's Windows Media Audio 9 Lossless (WMA Lossless), Monkey's Audio, TTA, and WavPack.

Some audio formats feature a combination of a lossy format and a lossless correction; this allows stripping the correction to easily obtain a lossy file. Such formats include MPEG-4 SLS (Scalable to Lossless), WavPack, and OptimFROG DualStream.

Other formats are associated with a distinct system, such as:

- Direct Stream Transfer, used in Super Audio CD

- Meridian Lossless Packing, used in DVD-Audio, Dolby TrueHD, Blu-ray and HD DVD

Lossy audio compression

Comparison of acoustic spectrograms of a song in an uncompressed format and lossy formats. That the lossy spectrograms are different from the uncompressed one indicates that they are, in fact, lossy, but nothing can be assumed about the effect of the changes on perceived quality.

Lossy audio compression is used in a wide range of applications. In addition to the direct applications (mp3 players or computers), digitally compressed audio streams are used in most video DVDs, digital television, streaming media on the internet, satellite and cable radio, and increasingly in terrestrial radio broadcasts. Lossy compression typically achieves far greater compression than lossless compression (data of 5 percent to 20 percent of the original stream, rather than 50 percent to 60 percent), by discarding less-critical data.

The innovation of lossy audio compression was to use psychoacoustics to recognize that not all data in an audio stream can be perceived by the human auditory system. Most lossy compression reduces perceptual redundancy by first identifying perceptually irrelevant sounds, that is, sounds that are very hard to hear. Typical examples include high frequencies or sounds that occur at the same time as louder sounds. Those sounds are coded with decreased accuracy or not at all.

Due to the nature of lossy algorithms, audio quality suffers when a file is decompressed and recompressed (digital generation loss). This makes lossy compression unsuitable for storing the intermediate results in professional audio engineering applications, such as sound editing and multitrack recording. However, they are very popular with end users (particularly MP3) as a megabyte can store about a minute's worth of music at adequate quality.

Coding methods

To determine what information in an audio signal is perceptually irrelevant, most lossy compression algorithms use transforms such as the modified discrete cosine transform (MDCT) to convert time domain sampled waveforms into a transform domain. Once transformed, typically into the frequency domain, component frequencies can be allocated bits according to how audible they are. Audibility of spectral components calculated using the absolute threshold of hearing and the principles of simultaneous masking—the phenomenon wherein a signal is masked by another signal separated by frequency—and, in some cases, temporal masking—where a signal is masked by another signal separated by time. Equal-loudness contours may also be used to weight the perceptual importance of components. Models of the human ear-brain combination incorporating such effects are often called psychoacoustic models.

Other types of lossy compressors, such as the linear predictive coding (LPC) used with speech, are source-based coders. These coders use a model of the sound's generator (such as the human vocal tract with LPC) to whiten the audio signal (i.e., flatten its spectrum) before quantization. LPC may be thought of as a basic perceptual coding technique: reconstruction of an audio signal using a linear predictor shapes the coder's quantization noise into the spectrum of the target signal, partially masking it.

Lossy formats are often used for the distribution of streaming audio or interactive applications (such as the coding of speech for digital transmission in cell phone networks). In such applications, the data must be decompressed as the data flows, rather than after the entire data stream has been transmitted. Not all audio codecs can be used for streaming applications, and for such applications a codec designed to stream data effectively will usually be chosen.

Latency results from the methods used to encode and decode the data. Some codecs will analyze a longer segment of the data to optimize efficiency, and then code it in a manner that requires a larger segment of data at one time to decode. (Often codecs create segments called a "frame" to create discrete data segments for encoding and decoding.) The inherent latency of the coding algorithm can be critical; for example, when there is a two-way transmission of data, such as with a telephone conversation, significant delays may seriously degrade the perceived quality.

In contrast to the speed of compression, which is proportional to the number of operations required by the algorithm, here latency refers to the number of samples that must be analyzed before a block of audio is processed. In the minimum case, latency is zero samples (e.g., if the coder/decoder simply reduces the number of bits used to quantize the signal). Time domain algorithms such as LPC also often have low latencies, hence their popularity in speech coding for telephony. In algorithms such as MP3, however, a large number of samples have to be analyzed to implement a psychoacoustic model in the frequency domain, and latency is on the order of 23 ms (46 ms for two-way communication)).

Speech encoding

Speech encoding is an important category of audio data compression. The perceptual models used to estimate what a human ear can hear are somewhat different from those used for music. The range of frequencies needed to convey the sounds of a human voice are normally far narrower than that needed for music, and the sound is normally less complex. As a result, speech can be encoded at high quality using a relatively low bit rate.

If the data to be compressed is analog (such as a voltage that varies with time), quantization is employed to digitize it into numbers (normally integers). This is referred to as analog-to-digital (A/D) conversion. If the integers generated by quantization are 8 bits each, then the entire range of the analog signal is divided into 256 intervals, and all the signal values within an interval are quantized to the same number. If 16-bit integers are generated, then the range of the analog signal is divided into 65,536 intervals.

This relation illustrates the compromise between high resolution (a large number of analog intervals) and high compression (small integers generated). This application of quantization is used by several speech compression methods. This is accomplished, in general, by some combination of two approaches:

- Only encoding sounds that could be made by a single human voice.

- Throwing away more of the data in the signal—keeping just enough to reconstruct an "intelligible" voice rather than the full frequency range of human hearing.

Perhaps the earliest algorithms used in speech encoding (and audio data compression in general) were the A-law algorithm and the μ-law algorithm.

History

A literature compendium for a large variety of audio coding systems was published in the IEEE Journal on Selected Areas in Communications (JSAC), February 1988. While there were some papers from before that time, this collection documented an entire variety of finished, working audio coders, nearly all of them using perceptual (i.e. masking) techniques and some method of frequency analysis and back-end noiseless coding. Several of these papers remarked on the difficulty of obtaining good, clean digital audio for research purposes. Most, if not all, of the authors in the JSAC edition, were also active in the MPEG-1 Audio committee.

The world's first commercial broadcast automation audio compression system was developed by Oscar Bonello, an engineering professor at the University of Buenos Aires. In 1983, using the psychoacoustic principle of the masking of critical bands first published in 1967,[22] he started developing a practical application based on the recently developed IBM PC computer, and the broadcast automation system was launched in 1987 under the name Audicom. Twenty years later, almost all the radio stations in the world were using similar technology manufactured by several companies.

Video

Video compression uses modern coding techniques to reduce redundancy in video data. Most video compression algorithms and codecs combine spatial image compression and temporal motion compensation. Video compression is a practical implementation of source coding in information theory. In practice, most video codecs also use audio compression techniques in parallel to compress the separate, but combined data streams as one package.

The majority of video compression algorithms use lossy compression. Uncompressed video requires a very high data rate. Although lossless video compression codecs perform at a compression factor of 5-12, a typical MPEG-4 lossy compression video has a compression factor between 20 and 200. As in all lossy compression, there is a trade-off between video quality, the cost of processing the compression and decompression, and system requirements. Highly compressed video may present visible or distracting artifacts.

Some video compression schemes typically operate on square-shaped groups of neighboring pixels, often called macroblocks. These pixel groups or blocks of pixels are compared from one frame to the next, and the video compression codec sends only the differences within those blocks. In areas of video with more motion, the compression must encode more data to keep up with the larger number of pixels that are changing. Commonly during explosions, flames, flocks of animals, and in some panning shots, the high-frequency detail leads to a decrease in quality or the increase in the variable bitrate.

Encoding theory

Video data may be represented as a series of still image frames. The sequence of frames contains spatial and temporal redundancy that video compression algorithms attempt to eliminate or code in a smaller size. Similarities can be encoded by only storing differences between frames, or by using perceptual features of human vision. For example, small differences in color are more difficult to perceive than are changes in brightness. Compression algorithms can average a color across these similar areas to reduce space, in a manner similar to those used in JPEG image compression.[25] Some of these methods are inherently lossy while others may preserve all relevant information from the original, uncompressed video.

One of the most powerful techniques for compressing video is interframe compression. Interframe compression uses one or more frames; that can be either earlier or later frames in a sequence to compress the current frame, while intraframe compression uses only the current frame, effectively being image compression.[26]

The most powerful used method works by comparing each frame in the video with the previous one. If the frame contains areas where nothing has moved, the system simply issues a short command that copies that part of the previous frame, bit-for-bit, into the next one. If sections of the frame move in a simple manner, the compressor emits a (slightly longer) command that tells the decompressor to shift, rotate, lighten, or darken the copy. This longer command does remain much shorter than intraframe compression. Interframe compression works well for programs that will simply be played back by the viewer, but can cause problems if the video sequence needs to be edited.

Because interframe compression copies data from one frame to another, if the original frame is simply cut out (or lost in transmission), the following frames cannot be reconstructed properly. Some video formats, such as DV, compress each frame independently using intraframe compression. Making 'cuts' in the intraframe-compressed video is almost as easy as editing uncompressed video: one finds the beginning and ending of each frame, and simply copies bit-for-bit each frame that one wants to keep, and discards the frames one doesn't want. Another difference between intraframe and interframe compression is that, with intraframe systems, each frame uses a similar amount of data. In most interframe systems, certain frames (such as "I frames" in MPEG-2) aren't allowed to copy data from other frames, so they require much more data than other frames nearby.

It is possible to build a computer-based video editor that spots problems caused when I frames are edited out while other frames need them. This has allowed newer formats like HDV to be used for editing. However, this process demands a lot more computing power than editing intraframe compressed video with the same picture quality.

Today, nearly all commonly used video compression methods (e.g., those in standards approved by the ITU-T or ISO) apply a discrete cosine transform (DCT) for spatial redundancy reduction. The DCT that is widely used in this regard was introduced by N. Ahmed, T. Natarajan and K. R. Rao in 1974. Other methods, such as fractal compression, matching pursuit and the use of a discrete wavelet transform (DWT) have been the subject of some research but are typically not used in practical products (except for the use of wavelet coding as still-image coders without motion compensation). Interest in fractal compression seems to be waning, due to recent theoretical analysis showing a comparative lack of effectiveness of such methods.

https://en.wikipedia.org/wiki/Data_compression

Social Network Advertising

This is a form of online advertising that focuses on social networking services. One of the major benefits of this type of advertising is that advertisers can take advantage of the users' demographic information and target their ads appropriately.

Social media targeting combines current targeting options (like geotargeting, behavioral targeting, socio-psychographic targeting, etc.), to make detailed target group identification possible. With social media targeting, advertisements are distributed to users based on information gathered from target group profiles.

Social network advertising is not necessarily the same as social media advertising. Social media targeting is a method of optimizing social media advertising by using profile data to deliver advertisements directly to individual users. Social media targeting refers to the process of matching social network users to target groups that have been specified by the advertiser.

Application

People who use social networks store various information about themselves including, but not limited to, their age, gender, interests, and location. This stored information allows advertisers to create specific target groups and individualizes their advertisements. The advantage for advertisers is that their ads can reach people who are interested in the product or service. The advantage for users is that they can see ads that appeal to them. Facebook, for example, the hugely popular social network, has developed a targeting technology which allows advertisements to reach a specific audience. This is why Facebook users see advertisements on their profile page that are tailored to their gender, music taste, or location.

Operation

Users provide demographic information, interests, and images within social communities. This information is accessed by social media targeting software and enables advertisers to create display ads with characteristics that match those of social network users. The important component of social media targeting is the provision of the users' socio-demographic and interest information. By using this information, social media targeting makes it possible for users to see advertisements that might interest them. The availability of user data allows for detailed analysis and reporting, which is a big part of social media targeting and what makes it more effective than statistical projections alone.
Demographics

About three-quarters of Internet users are members of at least one social network. 49% of U.S. adult women visit social media sites a few times a day, whereas only 34% of men visit them. The fastest-growing age group on Twitter is 55- to 64-year-olds, up 79% since 2012. And the 45-54 age group is the fastest-growing on Facebook and Google+. Social media use is still more common among 89% of Internet users aged 18-29, versus 43% of users that are 65 and older.

Types of Advertising

Popular social media sites, Facebook, Twitter, and YouTube, offer different ways to advertise brands. Facebook gives advertisers options such as promoted posts, sponsored stories, page post ads, Facebook object (like) ads, and external website (standard) ads. To advertise on Twitter, there are promoted tweets, trends, and promoted accounts that show up on users newsfeeds. For advertising on YouTube, there are branded channels, promoted videos, an in video advertising.

In July 2015, during their Q2 earnings call, Facebook revealed that it achieved $2.9B in mobile revenue, amounting to over 76% of its overall quarterly revenue. A large portion of this revenue was from app install ads, of which developers buy on a Cost per Install basis.

Advantages

There are several advantages for businesses or organizations that use social network adverting. These advantages include:

- Advertisers can reach users who are interested in their products.

- This method of advertising allows for detailed analysis and reporting.

- The information gathered is real, not from statistical projections.

Social Networking adds the ability of users to share content amongst their social connections. This allows the ability to spread content socially, which is known as the viral effect. Using multiple venues to promote advertising should be considered important. Each venue offers the potential to attract additional people.

https://en.wikipedia.org/wiki/Social_network_advertising

Scientific Linux

And now for something Interesting from the world of Open Source operating systems.

Scientific Linux is a Linux operating system distribution maintained by the United States Department of Energy - Fermi National Accelerator Laboratory and the European Organization for Nuclear Research. It is a free and open source operating system based on Red Hat Enterprise Linux. It provides a feature rich Desktop / Workstation environment that can be used for both business and personal use.

https://www.scientificlinux.org/

System Administrator's Guide
Deployment, Configuration, and Administration of Red Hat Enterprise Linux 7

https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/System_Administrators_Guide/

Third party software repositories can be added to enable the installation of additional software packages:

Extra Packages for Enterprise Linux (EPEL)

This is a Fedora Special Interest Group that creates, maintains, and manages a high quality set of additional packages for Enterprise Linux, including, but not limited to, Red Hat Enterprise Linux (RHEL), CentOS and Scientific Linux (SL), Oracle Linux (OL).

http://fedoraproject.org/wiki/EPEL

ELRepo

A community repository an RPM repository for Enterprise Linux packages. ELRepo supports Red Hat Enterprise Linux (RHEL) and its derivatives (Scientific Linux, CentOS & others).

The ELRepo Project focuses on hardware related packages to enhance your experience with Enterprise Linux. This includes filesystem drivers, graphics drivers, network drivers, sound drivers, webcam and video drivers.

http://www.elrepo.org