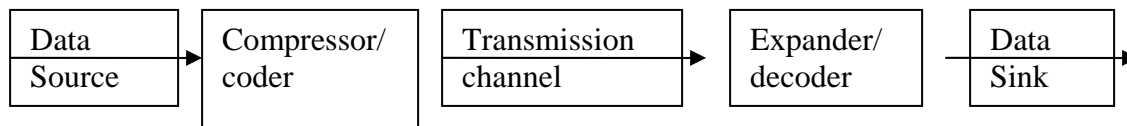


Course: Media Technology
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Seminar: MP3

Mp3 is the file extension for MPEG 1/2, audio layer III.

- MPEG is actually an acronym for the Moving Pictures Experts Group which was formed by the ISO to set standards for audio and video compression.
- The data rate is reduced at source by the compressor.



The compressed data are passed through a communication channel and returned to the original rate by the expander.

- Compression, bit rate reduction, data reduction and source coding are all terms which mean basically the same thing.
- Why audio compression through Mp3 is necessary?
 - (a) Compression extends the playing time of a given storage device.
 - (b) Compression allows miniaturization. With fewer data to store, the same playing time is obtained with smaller hardware. This is useful in electronic news gathering and in consumer devices.
 - (c) Tolerances can be relaxed. With fewer data to record, storage density can be reduced making equipment which is more resistant to unapproachable environments and which requires less maintenance.
 - (d) In transmission systems, compression allows a reduction in bandwidth which will generally result in a reduction in cost. This may make possible a service which would be impracticable without it.
 - (e) If a given bandwidth is available to an uncompressed signal, compression allows faster than real-time transmission in the same bandwidth.
 - (f) If a given bandwidth is available, compression allows a better-quality signal in the same bandwidth.

Layer III is the most complex layer. Layer III is one of three coding schemes (layer I, layer II and layer III) for the compression of audio signals. Layer III uses perceptual audio coding and psychoacoustic compression to remove all superfluous information (more specifically, the redundant and irrelevant parts of a sound signal. The stuff the human ear doesn't hear anyway). It also adds a MDCT (Modified Discrete Cosine Transform) that implements a filter bank, increasing the frequency resolution 18 times higher than that of layer II.

The result in real terms is layer III shrinks the original sound data from a CD (with a bit rate (denotes the average number of bits that one second of audio data will consume) of 1411.2 kilobits per one second of stereo music) by a factor of 12 (down to 112-128kbps) without sacrificing sound quality.

Because Mp3 files are small, they can easily be transferred across the Internet. Controversy arises when copyrighted songs are sold and distributed illegally off of Web sites. On the other hand, musicians may be able to use this technology to distribute their own songs from their own Web sites to their listeners, thus eliminating the need for record companies. Costs to the consumer would decrease, and profits for the musicians would increase.

Much more than a definition, MP3 is nothing less than a cultural and economic revolution on the Internet. Every day, hundreds of thousands of MP3 music files are searched for, shared, recorded and listened to by computer and Internet users of all kinds. Either alone or collected into massive download sites, the MP3 revolution is seriously threatening the traditional ways people find, listen to and create music

Mp3Pro is the name of the combination of two things: Mp3 and an audio coding enhancement tool from Coding Technologies named Spectral Band Replication (SBR). The goal of SBR is to enhance the audio quality of highly compressed sound files. While a conventional Mp3 encoder at low bit rates (as an example 64 kbps) will not be able to maintain full bandwidth, giving you only the grey output, using spectral band replication you will obtain a full bandwidth signal once decoded (grey + orange signal). The advantage is that SBR only uses a small fraction of the bit rate in the encoded file.

References

- - Fraunhofer Institute for Integrated Circuits IIS Available WWW: <http://www.iis.fraunhofer.de/amm/techinf/layer3/index.html>
- - John Watkinson, The MPEG Handbook, MPEG-1,MPEG-2,MPEG-3
- - Karl-Heinz Brandenburg, MP3 and AAC Explained
- - Mp3' Tech - Mp3Pro/SBR, Available WWW: <http://www.mp3-tech.org/sbr.html>
- - Robert F. Easley, John G. Michel, Sarv Devaraj, The MP3 open standard and the music industry's response to Internet piracy.
- - Webopedia: Online Dictionary for Computer and Internet Terms: Available WWW: <http://webopedia.com>