

Compression of Image with Different File Formats

Abdul Jabbar*

Bahauddin Zakariya University, Multan, Pakistan

Abstract

Reducing the size of original data (Image, Audio, or Video) is called Data compression. Data compression is basically a technique in which data is represented with the help of fewer bits. These fewer bits (fewer pixels) will represent the original data as it is represented with the help of larger bits (larger pixels). With the help of lower bits (fewer pixels), the size of the data automatically decrease, it takes less storage space, faster writing and reading, it takes less time during the uploading and downloading. Whether you're dealing with images, music, or video files, it's important to understand the difference between different types of formats and when to use them. Using the wrong format could ruin a file's quality or make its file size unnecessarily large. In this paper, I present a comparison among different image formats in the form of table, so that the user will decide which image format is better to use before using it.

Keywords: File formats; Lossy data compression; Lossless data compression; Data compression

Introduction

Images are very important documents nowadays; to work with them in some applications they need to be compressed, the main idea in image compression is to reduce the data stored in the original image to a smaller amount, the reduced file is called the compressed file and reconstitute file, is called the decompressed file. During decompressing, the original file may be fully recovered from the original file without any loss of actual information but some time, the original file may not be fully recovered from the original file due to loss of some information [1]. This process is divided into following two categories based on fully recovered data and not fully recovered data- Lossless Compression and Lossy Compression (Figure 1).

Lossless compression

Lossless compression is basically a technique where loss of information is zero means original image or file can be recovered without the loss of any kind of information, the original file is recovered when it is uncompressed (Figure 2) [2].

Lossy compression

Lossy compression is basically a technique where loss of information is not zero means original image or file cannot be recovered without the loss of any kind of information. The original file cannot be recovered when it is uncompressed (Figure 3) [2].

From Figures 2 and 3, it is clear that the original file cannot be reconstituted when we apply lossy compression methods and original file can be reconstituted when we apply lossless compression methods

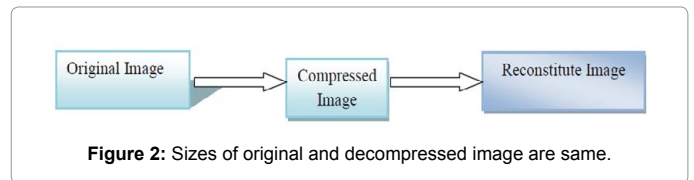


Figure 2: Sizes of original and decompressed image are same.

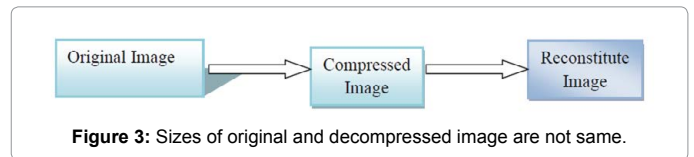


Figure 3: Sizes of original and decompressed image are not same.

on file. But it does not mean that lossy compression methods cannot be used in compression because there are some advantages along with its disadvantages. Some image formats have advantages to use lossy compression and some have advantages to use lossless data compression.

Proposed Work

In our work, we are going to present a table of different image formats to give a clear comparison between lossy and lossless compression methods (Table 1).

Conclusion

Clearly, our proposed table is not very technical but it can help to improve some existing compression methods. This paper demonstrates some useful image formats to give a clear idea to user that which image format is better to use in which scenario. This table also gives the idea about compression of image that how much an image is compressed (size is reduced in the form of pixels).

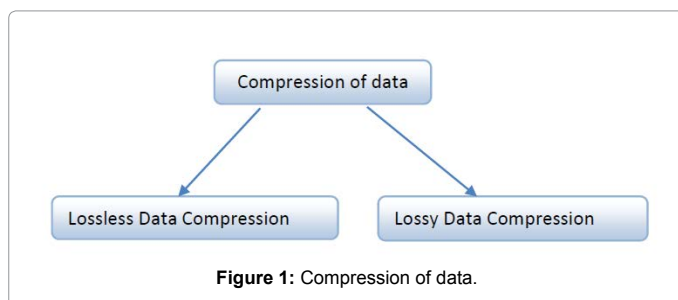


Figure 1: Compression of data.

*Corresponding author: Abdul Jabbar, Bahauddin Zakariya University, Multan, Pakistan, Tel: +92619210097; E-mail: ajmcs@yahoo.com

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S No	Format	Name	Compressed Method
1	JPEG	Joint Photographic Experts Group	Lossy
2	GIF	Graphic Interchange Format	Lossless
3	TIFF	Tagged Image File Format	Lossless
4	PNG	Portable Network Graphics	Lossless
5	BITMP	Bitmapped Graphics Format	Lossless
6	RAW	Raw Image Format	Lossless
7	PSD	Photoshop Document	Lossless
8	DGN	Digital Negative	Lossless
10	SVG	Scalable Vector Graphics	Lossless
11	SWF	Shockwave Flash	Lossless
12	XCF	Gimp Project File	Lossless/Lossy
13	PPM	Portable Pixmap	Lossy
14	EXIF	Exchangeable Image File Format	Lossy
15	CGM	Computer Graphics Metafile	Lossy
16	PAM	Portable Arbitrary Map	Lossy
17	MPO	Multi Picture Format	Lossy
18	JPS	Jpeg Stereo	Lossy
19	WMF	Window Metafiles	Lossy/Lossless
20	WEBP	Webp	Lossy
21	ILBM	Interleaved Bitmap	Lossless
22	RLE	Run Length Encoding	Lossless
23	IFF	Interchange File Formats	Lossless
24	GPL	General Public License	Lossless
25	PGF	Graphics Interchange Format	Lossless

Table 1: Comparison between lossy and lossless compression methods

References

1. Gonzalez RC, Woods RE (2009) Digital Image Processing. 2nd edn., Prentice Hall, USA.
2. https://en.wikibooks.org/wiki/Data_Compression.