

A Survey Paper on Image Compression Technique

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Abstract— In this advance world where every image is Digitized for transmission and computer processing, whether scanned from two-dimensional analog originals or captured using an image sensor-equipped device such as a digital camera, CAT scanner. This paper provides a survey about JPEG Mini- Image Compression which was developed by “BEAMR”, An imaging Technology Company that powers some of the world's top web publishers, social networks and media companies which is led by serial entrepreneurs and technology experts, possessing an extensive experience in media compression and delivery.

Key words: JPEG Mini, Lossless, BEAMR, Compression Software, JPEG Mini online

I. INTRODUCTION

JPEG mini is a photo compression technology that reduces the file size of JPEG photos by up to 5X, while preserving the resolution and quality of the original photos. To spot any difference you have Superman X-ray vision and even then you are gonna have hard time to find. JPEG mini is a patent-pending photo re-compression technology, which reduces the size of photographs without affecting their perceptual quality.

II. SURVEY REVIEW

In this we have reviewed the existing tools and technologies in the field of JPEG standard. JPEG realized is that many digital images have very gradual changes in the intensity over most of the image. Besides this they realized that the human eye can only differentiate between similar shades of light-intensity, or luminance, to a certain extent. The JPEG discovered that besides removing the most of the variations in luminance, most of the slight changes in color (from pixel to pixel) can be removed and still end up with a very good representation of the image. This way, instead of storing the individual pixel's color and intensity, only the gradual changes of color and luminance (across the picture) need to be stored which results in smaller file size.

III. COMPRESSION TECHNIQUE-DEFINITION

JPEG mini works by analysing the input image using a unique quality detector which imitates the human visual system, and based on this analysis applying the maximum amount of compression which will not cause visible artifacts. The technology works in the domain of baseline JPEG, resulting in files that are fully compatible with any browser, photo software or device that support the standard JPEG format.

JPEG mini is capable of reducing the file size of standard JPEG photos by up to 80% (5X), while the resulting photos are visually identical to the original photos. The JPEG mini algorithm imitates the perceptual qualities of the human visual system, ensuring that each photo is compressed to the maximum extent possible by removing redundancies, without creating any visual artifacts in the process. This enables fully

automatic, maximal compression of photos with no human intervention required.

IV. OVERVIEW

With JPEG mini compress your digital camera pictures and see difference in size without any difference by which you can store more photos on your hard drive and online photo service accounts, attach more photos to your emails, and upload your photos faster to the web. If you have an image-intensive website, your pages will load faster, improving user experience and SEO, and you'll also reduce your storage and bandwidth costs. JPEG mini files are in Standard JPEG format, which can be viewed and edited by any browser, photo software or consumer device.

A. Operation

There are currently two main pieces of software available- the JPEG mini app and the JPEG mini Light-room plugin (pro).



Fig. 1: JPEG Mini & JPEG Mini Pro

JPEG mini technology has two main components:

The first is an image quality detector, which imitates the perceptual qualities of the human visual system, to determine the maximum amount of compression which can be applied to each individual photo without causing visible artifacts.

The second is a unique JPEG encoder, which adapts the JPEG encoding process to the original photos, creating the most compact representation of the photos that is possible under the JPEG standard. Combining these two components enables JPEG mini to achieve an extremely high re-compression ratio of up to 5x, or 80% reduction on digital photos, depending on their resolution.

The technique of Lossless compression is implemented on colour images having high resolution. The implementation part is done using MATLAB software. The RGB image is read and stored in MATLAB as a 3-dimensional matrix consisting of three 2-dimensional matrices, each comprising the respective pixel values of the R, G and B components. Next, colour space conversion is done. Here the image is converted to the YUV color space from the RGB colour space. The 3-D matrix now consists of three Y (luminance), CB & Cr (Chrominance) matrices. The Y (luminance) matrix is then taken and divided into 8x8 blocks i.e. blocks containing 8 rows and 8 columns of the Y matrix. The pattern followed here is that first the top leftmost 8x8 block is taken, then we move from left to right and then

up to down. On each of the blocks 2-dimensional Discrete Cosine Transform is applied.

The same process is then carried out on both the chrominance components. Thus we obtain a DCT matrix consisting of the transformed values of all the elements of the original matrix.

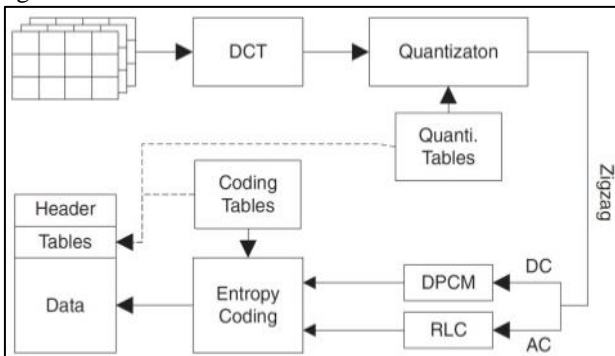


Fig. 2: Block Diagram for JPEG Compression

B. Performance & Result

Just drag and drop the photos or folders you had like to process into the window and the JPEG mini application will do its operation. It also keeps a running tally of the amount of space you have saved, as shows in the below figure.

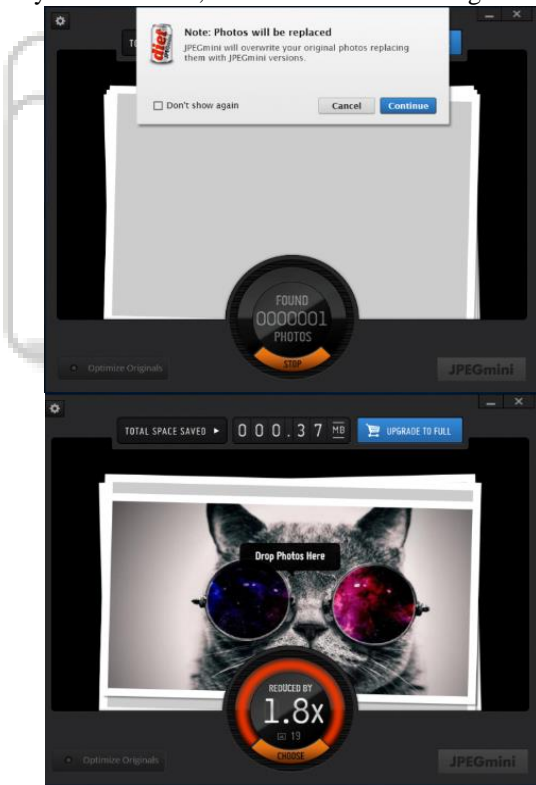


Fig. 3: Compression of Image using JEPG mini Software

1) Performance

The table below summarizes the file size reduction ratios achieved by JPEG mini for various photo resolutions.

JPEG Photo Resolution	Typical JPEG mini file size reduction
8 MP and higher	70 - 80%
3 - 7 MP	50 - 70%
1 - 2 MP	40 - 60%
Lower than 1 MP	30 - 50%

Table 1:

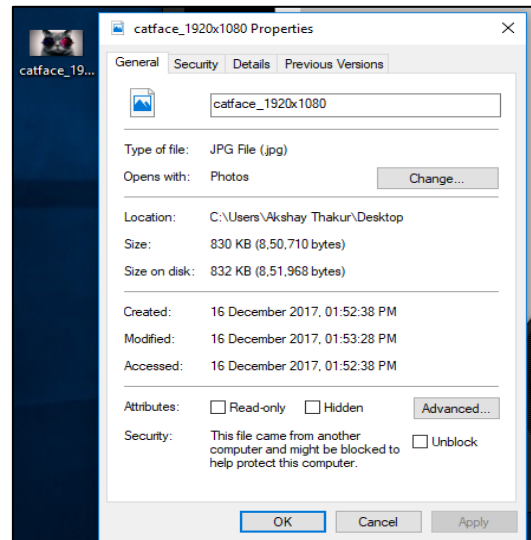


Fig. 4: Original Image (830kb size)

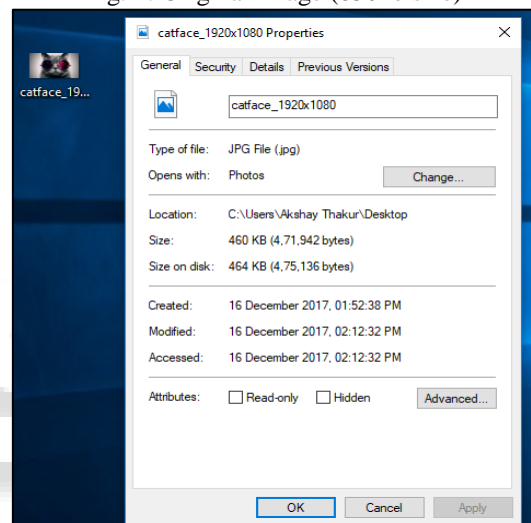


Fig. 5: Compressed Image (460kb size)

2) Result

No difference in the image quality after Image Compression



Fig. 6: Quality of Image after Compression Done Using JPEG Mini

C. Advantages

- 1) JPEG mini can save space on the hard drive but can also save time when sending images using e-mail or other services.
- 2) Online storing and backing up of images can be costly but compressing them efficiently can save the costs.
- 3) Easy to access images even in low speed mobile data.

- 4) Other potential clients that can benefit from the JPEG mini technology are business – especially those with huge repositories of images (Increasing site speed).

D. Disadvantages

- 1) While using free application, JPEG mini will overwrite your original photos replacing them with JPEG mini versions.

V. CONCLUSION

JPEG mini is a perfect tool for users who are tired of making the compromise between image quality and fast loading website. The application will reduce the overall size of your JPEG files, by up to 5px, without sacrificing image quality or resolution.

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