

Extended Information on Digital Photos

The Perfect Picture



So you finally took that perfect snapshot on your last vacation. But do you remember the camera settings? The EXIF information on a digital photo can help you re-discover the settings that led to that perfect photo, and many other things. Under Linux we can find, examine and use the information.

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replaced their analog counterparts. The **header** of each image file contains information on the settings and ambient conditions at the time.

What is EXIF?

Digital cameras store images in **JPEG** or **TIFF** files and extended information in the **EXIF** format [1]. EXIF is the acronym for “Exchangeable Image File Format” and was specified as part of the **DCF** standard developed by the Japanese **JEITA** association [2]. Box 1 shows the most common types of EXIF information, although each camera implements different types and a different subset. The *libexif* [3] library is required to interpret this data on Linux.

Many image editing programs, such as *Gimp* [4] discard the EXIF data. Thus, it makes sense to back up the original before making any changes.

Graphic Editing

A specialized tool, such as *Gexif* [3], will facili-

tate viewing and editing the EXIF data. Newer SuSE versions include it with the *gtkam* package, which additionally requires *libexif-gtk*. Many other distributions include a package called *gexif*.

After launching the tool by typing *gexif* in the command line, you can select *File / Open* to open an image file. The *0* tab (see Figure 1) displays some basic information: the camera used, the resolution, and the exposure date. The *1* tab shows the compression, and the camera settings are shown below *EXIF* (see Figure 2).

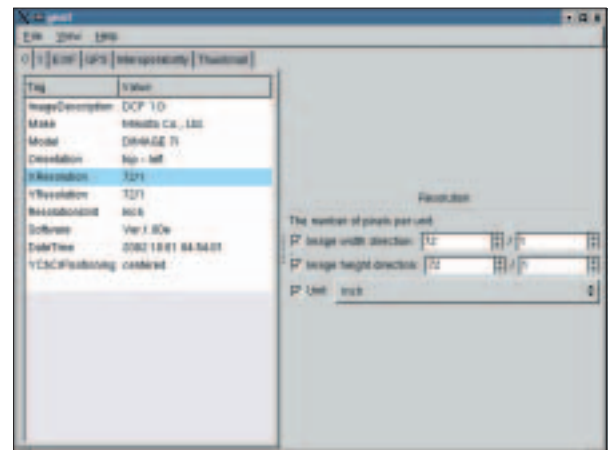


Figure 1: Gexif displaying information on the camera manufacturer and model

The more you know about a picture, the more you can learn from it as a reference point for future work. In the age of analog photography, photographers used to jot down data such as the aperture setting and range on paper. This allowed them to reconstruct the settings later. Fortunately, this is no longer necessary now that digital cameras have

GLOSSARY

Header: The header of a file stores additional information in front of the actual content of the file.

JPEG: This image format, specified by the “Joint Photographic Expert Group”, is capable of displaying up to 16,7 million colors and uses a compression algorithm that selectively

removes specific image data.

TIFF: The “Tagged Image File Format” was developed by Microsoft and Aldus, and compresses images without any information loss.

DCF: The “Design Rule for Camera Filesystems” defines the directory structure, filenames and file formats for digital cameras.

GPS: The “Global Positioning System” allows a GPS device to discover its own position by using stationary satellites positioned around the earth.

Environment variables: Allow the user to stipulate temporary or permanent values for individual or all processes.

If your camera has a **GPS** connector, the *GPS* tab displays the location co-ordinates. *Interoperability* includes technical specifications for the EXIF standard used. Finally, a preview of the image is available in *Thumbnail* (see Figure 3).

Clicking on an entry in one of the tabs opens a text box with the current value in the right-hand panel of the Gexif window, allowing you to add new data, or modify the existing values. When you are finished, you can select *File / Save* to store the image under its the current name or *Save As...* to define a new name.

EXIF Data on the Command Line

Jhead [5] is a useful tool that supports quick editing of multiple JPEG files and their headers, however, it does not support TIFF files.

Unfortunately, the EXIF data in an image file is stored in binary format. You can use the following command to output this data:

```
jhead pic.jpg
```

The `-v` flag provides a more detailed view:

```
jhead -v pic.jpg
```

Exporting this information to a text file will allow you to parse it with a text tool such as *grep*.

The following script stores the EXIF data of the JPEG files in a text file, in the current directory, using the name of the image file and the *.txt* extension:



Figure 2: The EXIF tab displays the camera settings

```
for i in `ls *.jpg`
do
jhead -v $i > $i.txt
done
```

Thus, running the script stores the data from *pic.jpg* in a file called *pic.jpg.txt*.

You do not need a script to extract the thumbnails for your image files, instead stipulate the `-st` parameter:

```
jhead -st "&i_t.jpg" *.jpg
```

This stores the thumbnails in files with the same name as the original file, and uses *_t.jpg* as the extension.

The comment field in the EXIF header allows you to save a unique and intuitive description of the image.

```
jhead -ce pic.jpg
```

opens your standard editor, as specified in your *EDITOR* environment variable – *vi* by default. You can then modify the comment field as required.

Photo-Analysis

Details on the internal flash, the aperture, the distance to the subject, the focal distance, and the ISO rating facilitate photo-analysis and help you improve your skills as a photographer. You can note the settings you used for shots that turned out particularly well and re-apply them for your next photo shooting with similar ambient conditions. You can also learn from your mistakes, and gradually change parameter values until you achieve the desired results.

Experienced photographers know that it is difficult to pin these parameters down: wrong exposure times, alignments, and digital filters can all cause unnatural looking colors. With a little analysis, the EXIF data can help you find the faulty setting step-by-step.

EXIF information is a must for (semi-) professional tasks. So when purchasing a digital camera, make sure that it provides the data you need. ■

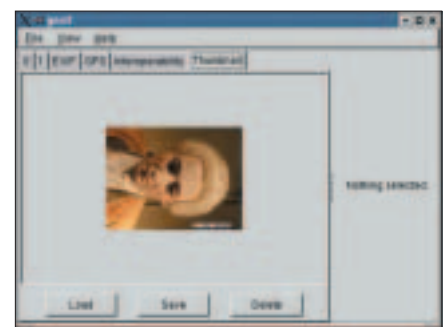


Figure 3: EXIF stores a thumbnail in the file header

Box 1: Common EXIF Information Types

- Camera manufacturer
- Camera model
- Image orientation (landscape or portrait)
- Resolution
- Date and time of exposure
- Aperture
- Shutter speed
- ISO value
- Thumbnail
- Color depth and compression
- Flash mode
- Focal distance
- Light meter
- Distance to subject
- Alignment
- Comment

INFO

- [1] EXIF homepage: <http://www.exif.org/>
- [2] Japan Electronics and Information Technology Industries Association: <http://www.jeita.or.jp/english/index.htm>
- [3] Gexif and libexif library: <http://sourceforge.net/projects/libexif/>
- [4] The GIMP: <http://www.gimp.org/>
- [5] Jhead tool: <http://www.sentex.net/~mwandel/jhead/>