# PFotos 1.5

TigerGraphics

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# Table of contents

Pr		nce	<b>4</b> 4
1	Intro	oduction	5
2	Requ	uirements, Download and Installation	6
	2.1	Requirements	6
		2.1.1 Operating systems	6
		2.1.2 Software requirements	6
	2.2	Download	6
	2.3	Installation	7
		2.3.1 Linux	7
		2.3.2 MacOS	7
		2.3.3 Windows	7
	2.4	What is new (History)	7
3	<b>Star</b> 3.1 3.2	Starting <b>PFotos</b>	<b>9</b> 9
4	Extr	acting and using EXIF Information 1	3
•	4.1	Extracting Exifs	-
		4.1.1 Drag & Drop	-
	4.2	Information Types (from Exif)	
		4.2.1 Cameras	
		4.2.2 Lenses	5
		4.2.3 Flash	
		4.2.4 File Type	
		4.2.5 Focal Length (35mm)	
		4.2.6 Focal Length	
		4.2.7 Aperture, ISO and Exposure Time	
		4.2.8 Hour of Day	
		4.2.9 How <b>PFotos</b> is sorting data	
		4.2.10 Date and Time	
5	The	Histogram Panels 18	8
-	5.1	Information	
	5.2	Time Sliders	

	5.3	Time Histogram
	5.4	Exclusion of files with no time information
	5.5	Exclusion of files in predefined directories
	5.6	Exclusion of predefined file names
	5.7	Exclusion of predefined file types
	5.8	Histogram Bins
6	Ima	ge Details 25
	6.1	Show Selection
	6.2	Extra buttons
		6.2.1 Open Image
		6.2.2 Close Selection
		6.2.3 Open Image Directory
		6.2.4 String search
	6.3	Limitations
	6.4	Save Selection
	6.5	Integration of an external ExifToolGUI
_	_	
7		Ferences 32
	7.1	Environment
	7.2	Localization, User Interface and pre-defined filters
	7.3	Information selection
8	Mor	nues/Toolbar 36
0	8.1	Rename Data file
	8.2	Save Selection
	0.2 8.3	
	0.5	export to TXT
9	Kno	wn Issues & ToDos 37
	9.1	Thumbnail size
	9.2	Directory Browsing
	-	
10	Abo	ut 38
	10.1	<b>PFotos</b> - how it began

# Preface

This manual is newly editied in Quarto as a book project and completely written in Markdown.

**PFotos** is free software under the following licence.

### Licence

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## **Download PFotos**

All installation packages can be found at **PFotos** Download

# **1** Introduction

The development of **PFotos** was motivated by a lack of image database statistics in most of image processing and organizing tools like Adobe Lightroom, Adobe Photoshop, Phase One's Capture One and a lot of more not to be listed here.

**PFotos** was inspired by Lightroom Dashboard<sup>1</sup> but hopefully provides some extended features. The goal was to make a stand-alone application that provides statistics on cameras, lenses, aperture and more image information taken from the EXIF data embedded in the images. Of course, the extraction of those information should act non-destructive on the images and should work on large catalogues or directory structures for comfort of the user.

TigerGraphics **PFotos** was developed under **MacOS** and **Linux 15.1** in **Tcl/Tk**, the extraction of EXIF data is done by the famous exiftool developed by Phil Harvey<sup>2</sup>. The Exiftool shall be installed on MacOS and Linux, either from the repositories of the distribution or from the installation packages from the before mentioned website.

Additionally, **PFotos** was ported to **Microsoft Windows 10**, which was the most challenging task and resulted in the decision to embed the exiftool executable in the **PFotos** structure for a flawless integration up to **PFotos** 1.4.

With **PFotos** 1.5 the exiftool can be installed and updated separately.

Additionally, the integration of two more tools was implemented: ImageMagick<sup>3</sup> and DCRaw<sup>4</sup>.

Please refer to the preferences section Chapter 7 for details.

<sup>&</sup>lt;sup>1</sup>LightroomDasboard

<sup>&</sup>lt;sup>2</sup>ExifTool

<sup>&</sup>lt;sup>3</sup>Magick

<sup>&</sup>lt;sup>4</sup>DCraw

# 2 Requirements, Download and Installation

### 2.1 Requirements

### 2.1.1 Operating systems

- MacOS High Sierra (10.13) or higher
- OpenSuse Linux 42.2 or higher
- Microsoft Windows 10

older versions may also work (64-bit OSes assumed; 32-bit Linux installations should work, 32-bit Windows-Variants might work but cannot be supported due to a lack of reference installations on our side)

#### 2.1.2 Software requirements

It was announced by Apple that the Tcl/Tk package will be removed from the standard installation of MacOS with one of the next versions.

Thus, we announce and recommend to install Tcl/Tk 8.6.9 (or higher) from the internet repositories (see below), even on MacOS High Sierra (10.13). The support for Tcl/Tk 8.5 will stop from **PFotos** version 1.4 on.

- Tcl/Tk: Tcl/Tk 8.6.8 is required from MacOS Big Sur (11.3) on. Please obtain the package from ActiveState according to your desired licence model.
- libtcl: according to the installed Tcl/Tk version (already included in the MacOS and the Microsoft Windows Tcl/Tk packages)
- exiftool: Version 10.79 or newer

### 2.2 Download

PFotos can be found on our private webserver: Download

### 2.3 Installation

The installation procedures are currently not as comfortable as we are looking for. But the first goal was to make the application available. We are looking for installers for the different operating systems to make things easier and fail-safe with follow-up versions.

### 2.3.1 Linux

First, install the packages Tcl/Tk, *libtcl* and *exiftool* according to the procedures of your Linux distribution. Then, copy the file pfotos.tar.gz to the directory where you want to install it (and where you do have the necessary permissions). Extract it by

tar -xzvf pfotos.tar.gz

Open a command terminal in the directory PFOTOS and type the command

./pfotos.tcl

For more convenience, please generate a so called starter icon for your desktop according to the procedure for your Linux distribution.

#### 2.3.2 MacOS

Install the *exiftool* from the installation package. To check the correct installation of exiftool open a Terminal window and execute the command exiftool. The manual page of exiftool shall be shown.

Finally, copy the application container PFotos.app either to the system's application Folder Programs or to any other desired location and simply start the application like any other one.

### 2.3.3 Windows

Unpack the *pfotos.zip* archive and run pfotos\_setup.exe to install **PFotos**. Install the exiftool Download ExifTool and take care to rename it from exiftool(k).exe to exiftool.exe. Otherwise the tool would only show its help pages.

### 2.4 What is new (History)

#### **PFotos** 1.5

After a new cross platform ExifToolGUI was released at ExifTool-GUI the decision was made to enable **PFotos** to transfer images to that tool. It must be considered, that those pieces of software are made to modify image meta data. So please take care of your image originals. Unfortunately, the author informed that the development of and the support for ExifTool- GUI has stopped. Please check whether one of the still available installation packages still fit for

your operating system.

Also new in the preferences tab is the possibility to to make use of *ImageMagick* and *DCraw* in **PFotos** as far as they are installed on your computer.

Since it is not possible to select executables in application containers on MacOS it was obvious to enable direct path entries for the external tools used by **PFotos**. This is visible in the preferences tab which have been rearranged a little for better overview. As a consequence, it is no longer necessary to include the exiftool by Phil Harvey in the **PFotos** package for Microsoft Windows . See the Windows section above. Additionally, the preferences tab of **PFotos** has been re-rearranged for a little better overview.

#### PFotos 1.4

New feature: New tab for histogram bins for hour of day – 24 bin for each hour of a day Update: exiftool: Version 12.25 included in the Microsoft Windows package

### **PFotos** 1.3

New feature: Histogram of image quantity over time Bugfix: Export of current selection corrected (mismatch to internal data structure re- paired) Update: exiftool: Version 11.76 included in the Microsoft Windows package

#### **PFotos** 1.2

New feature: EXIF information of individual images can be stored as plain text New feature: The operating system's default file browser can be launched at the indi- vidual images' parent directories

#### **PFotos** 1.1

New feature: User customizable settings for foreground (text) and background color New feature: Search and Marking functionality in the detailed EXIF information window Update: exiftool version 11.23 included in the Microsoft Windows package

#### PFotos 1.0

New feature: In the tiled selection view, mouse over gets the short EXIF information displayed as tool tip.

Fixed UTF-8 issue for Microsoft Windows when displaying detailed EXIF information.

# 3 Starting and Setting to Work

## 3.1 Starting PFotos

**Linux**: After installation **PFotos** can be started from any directory by the command PATH\_TO\_PFOTOS/pfotos from the commandline or by using the starter link.

MacOS: By starting the PFotos App by double clicking, as normal.

Windows 10: By double clicking the symbol, as normal.

### 3.2 Setting to Work

When **PFotos** is started for the first time on your computer, you will be directed to the Preferences tab to do some necessary preparations. First, the path to the **PFotos** data directory needs to be defined; in that directory, all the extracted EXIF-data from the inspected image directories will be stored. For details please have look into the preferences section Chapter 7.

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Select ImageMagic	<									
Select DCRaw										
Select ExifToolGUI	1									
Select Image Viewe										
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<ul> <li>Black</li> </ul>		⊻ ISO		ISO ISO		f Values: 1 1.4 2 2.5 2.8 3.5				
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	mono									

A second important point is to select an image viewer on Microsoft Windows and Linux platforms.

For MacOS, the default method *open* is the best selection and can simply be confirmed, but on Linux the system's default method *xdg-open* refers to the MIME-settings for the different image types which may lead to some strange results for RAW images.

Such, it is recommended to select your preferred image viewer hopefully capable to show all your cameras' RAW images.

For Windows platforms we need the path to and the executable of one of the many probably installed image viewers.

Maybe in later versions, we will be able to use the systems default; but it is currently not fully understood how to access it.

As mentioned above it now requested to locate the executable for the exiftool. Otherwise **PFotos** will not work. Also the ExifToolGUI should be located, but this is not mandatory to get **PFotos** working.

All here requested settings can be done by browsing through the system after clicking the respective *Select...* button or by directly typing the full path of the directory/executable. After having done these first selections, it is ok to proceed by clicking *Apply* and you will be directed to the \*Cams & Lenses\*\* tab.

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ſ	Select Exif Data Dire	ctory /	home/phot	o/TIGERGRAPH	IICS/PFOT	OSDATEN				Back to	PFot	tos Defau	ılts	Cancel	Ар	ply			
Ì	Select ExifTool	/	usr/bin/exi	ftool															
Ì	Select ImageMagick	. /	usr/bin/ma	igick															
Ì	Select DCRaw	/	usr/bin/dci	raw															
ĺ	Select ExifToolGUI																		
ĺ	Select Image Viewer	, , x	dg-open																
ĺ	Set System Default	Viewer																	
	Select Language 🏾 🛛	de 💿 en						F	ont Size: 9										
	Directory filter: <mark>.thumb</mark>	os																	
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	File type filter: <mark>.html .j</mark>																		
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		• red																	
		<ul> <li>prism</li> </ul>																	
		<ul> <li>mono</li> </ul>																	

Figure 3.1: The Preferences Tab with some senseful settings (on Linux)

Obviously, after the very first installation, there are no **PFotos** data available and the included dummy data set is selected automatically.

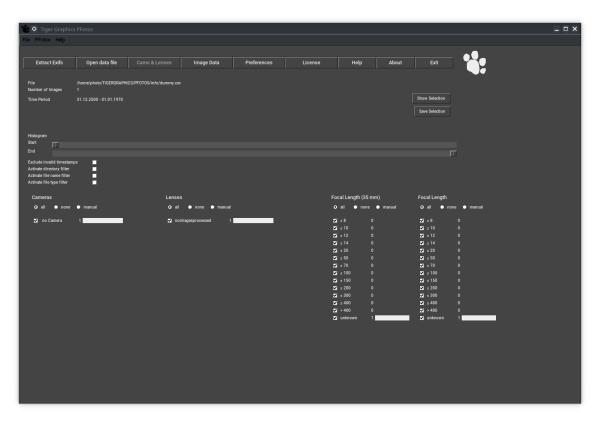


Figure 3.2: The Cams and Lenses Tab with the dummy data set loaded

# 4 Extracting and using EXIF Information

## 4.1 Extracting Exifs

Now it is time to generate the first **PFotos** data file.

Press the button *Extract Exifs* to select the directory which shall be analyzed. All subdirectories will be considered. This will take some time but must be done only once until new images are added somewhere in that directory structure. On MacOS and OpenSuse Linux the progress of the extraction process will be shown by an increasing list of file names of images beeing analyzed. Due to limitations of Tcl/Tk on Microsoft Windows platforms the output window stays empty during the process but shows the complete result of the process, when finalized. By finalization of the analysis process, the OK button gets activated and clicking on it will close the the windows and proceed to the *Cams & Lenses* tab where the just generated **PFotos** data file is loaded and the information is shown.



Figure 4.1: Sample output of the EXIF data extraction

### 4.1.1 Drag & Drop

**PFotos** is prepared to process selections of images and/or folders by dragging those selections from file managers (the Explorer on Microsoft Windows, Finder on MacOS and similar tools on OpenSuse Linux) to the **PFotos** application. For Microsoft Windows the the drag&drop functionality is available directly after installation with the create desktop icon feature being activated during installation.

For MacOS it is necessary to move the **PFotos** application to the Applications folder to activate the drag&drop feature.

ForLinux, please create a starter icon for the desktop and make sure, that the %F option is given. Please try to modify the included starter accordingly.

### 4.2 Information Types (from Exif)

**PFotos** currently provides two main tabs showing configurable sets of information types in so called bins. The different bins accumulate the information gathered from the EXIF data file in the following categories.

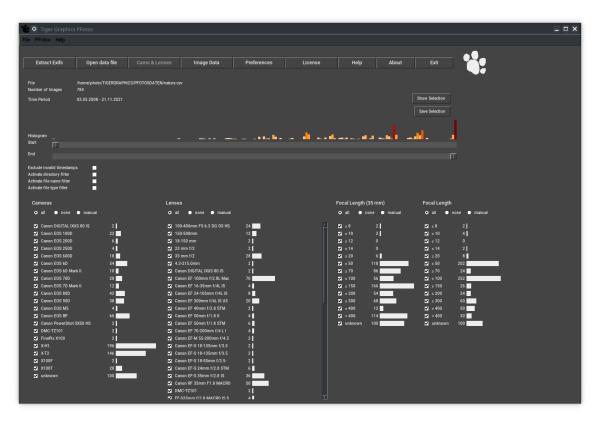


Figure 4.2: The Cams and Lenses Tab with a meaningful data set loaded

#### 4.2.1 Cameras

The *Cameras* bin shows all different camera types appearing in the selected data file and assignes the amount of images taken with each camera by the number and an according histogram bar. The camera name or denomination is taken from the EXIF Model data field. It is not further processed, except a – is replaced by the word unknown.

#### 4.2.2 Lenses

The *Lenses* bin shows all different lenses appearing in the selected data file and assignes the amount of images taken with each lens by the number and an according histogram bar. The lens name or denomination is taken from the EXIF LensID data field or from LensModel or finally from LensType if the others are -, n/a.

If nothing can be found (as for compact cameras or smart phones), the camera identifier is put into this data field, instead.

Some lenses from second manufacturers come with firmware chips from the OEM of the original lens type and the exiftool provides two alternatives in the identifier like OEM Lens Type or Second Manufacturer Lens Type.

In this case the Second Manufacturers entry is chosen. Finally, all *and* are removed from the data field due to making trouble in Tcl by being interpreted as tcl command delimiters.

#### 4.2.3 Flash

The *Flash* bin shows the histograms of whether a flash was fired for an image or not. The histogram is pre-defined to yes and no.

The flash value is taken from the EXIF Flash data field and the evaluation looks for the appearance of the word fired in that data field – EXIF provides something like 13 variants of information for a flash being fired.

We currently don't distinguish all those variants.

#### 4.2.4 File Type

The *File Type* bin shows the histograms of file types as they are derived from the image file name.

All file types included in the selected data file are shown in this list as they appear in the surveyed directory structure.

Non image file types should be deselected before looking into the selection.

Exiftool will do its best to get information but will fail on unsupported file types.

### 4.2.5 Focal Length (35mm)

The *Focal Length (35mm)* shows the histograms of the 35mm equivalent focal lengths the images were taken with. The histogram bins are pre-defined and can be selected in the preferences tab.

The 35mm equivalent focal length value is taken from the EXIF FocalLength35ef1 data field.

#### 4.2.6 Focal Length

The *Focal Length* shows the histograms of the physical focal lengths the images were taken with. The histogram bins are pre-defined and can be selected in the preferences tab. The focal length value is taken from the EXIF FocalLength data field.

### 4.2.7 Aperture, ISO and Exposure Time

The *Aperture*, *ISO* and *Exposure Time* bins show the histograms of the aperture, cam- eras ISO setting and the exposure time (in fractions of a second) the images were taken with.

The histogram slots are pre-defined and can be selected in the preferences tab. The values are taken from the EXIF Aperture, ISO and ShutterSpeed data fields.

#### 4.2.8 Hour of Day

The *Hour of Day* bin shows the histograms of the hours of a day when images were taken. The histogram slots are 24-hours pre-defined. The values are taken from the EXIF DateTimeOriginal data field.

### 4.2.9 How PFotos is sorting data

All bins with numerical content are sorted from smaller values on top to larger values at the bottom. The displayed slot values stand for all values up to and equal to the shown value.

E. g. the focal length 100mm slot counts all images taken with a focal length up and equal to 100mm.

If data sets are detected with values larger than the largest shown numerical value they are accumulated in the *other* histogram slot.

#### 4.2.10 Date and Time

Date and time information are also extracted from the images from the EXIF DateTimeOriginal data field.

These data are not shown in a slot but are determining the horizontal sliders to adjust the selection by *start time* and *end time*. If no date and time information can be derived from the EXIF data, **PFotos** sets 1970.01.01 -- 00:00:00 as the image's time stamp.

# **5** The Histogram Panels

From the preferences pane it is possible to assign any combination of the available bins to either the *Cams & Lenses* tab and the *Image Data* tab.

Please adjust according to your desires.

Currently the order of appearance of the bins is fixed and only a selection in which tab and whether a bin should appear is possible.

### 5.1 Information

- File: right hand of the label the name of the selected csv data file is displayed.
- Number of Images: right hand of the label the number of images of the applied selection is shown.
  - As soon as any filtering is active, the displayed number will change its color to orange.
- *Time Period*: right hand of the label the adjusted time period of the applied selection is shown.

As soon as one of the time sliders *Start* or *End* has been moved the display of the time period will change its color to orange.

### 5.2 Time Sliders

The time sliders allow to filter a time window from the complete data set.

The *Start* slider represents the first date to be regarded for all shown histograms; the *End* slider selects the last date.

By default they are set to the earliest respectively the latest date from the selected data file.

During moving the sliders, the time period display is updated; after release of the slider the data filtering is applied and the histograms get updated.

Images with invalid time stamps (e. g. from scanners or with removed EXIF information) do not influence the time sliders but are included in the histograms.

They can be excluded by using the *Exclude invalid time stamps* checkbutton (see below).

## 5.3 Time Histogram

Above the time sliders a histogram of image quantity is shown. Maximum 200 histogram slots are set up.

The period (width) of these histogram slots is determined from the total period of the current data set and the number of histogram slots.

When putting the mouse cursor on one of these histogram slots, the end time of that slot is shown.

Note: If only one slot results from a dataset no histogram is shown.

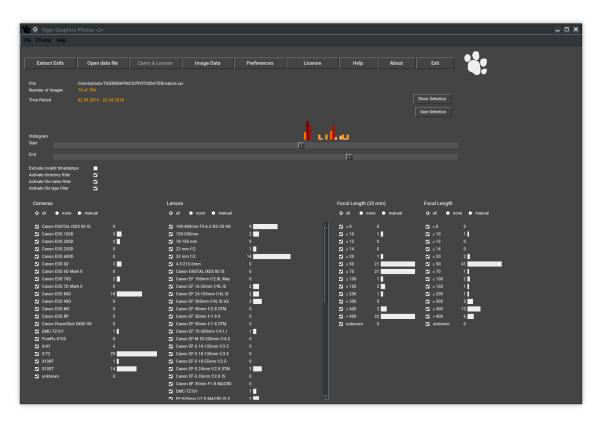


Figure 5.1: Selection by time period

By double clicking on a histogram bar of the time histogram, the time sliders are adjusted to the period in time represented by that histogram bar.

A second double click restores the settings of the time sliders.

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Tiger Graphics PFotos <2>								
e PFotos Help								
Extract Exifs Open d	data file Car	ms & Lenses Image Data	Preferences	License	Help	About	Exit	
File /home/photo	/TIGERGRAPHICS/PFOT	TOSDATEN/ophice.com						
Number of Images 11 of 784	TIGERGRAPHICS/PF01	TOSDATER/hature.csv						
							Show Selection	
Time Period 23.11.2016 -							Show Sciection	
							Save Selection	
Histogram								
Start								
End				Π				
Exclude invalid timestamps								
Activate directory filter								
Activate file name filter 🗾								
ctivate file type filter 🔽 🗹								
Cameras		Lenses			Focal Length (	35 mm)	Focal Length	
🗙 all 🔹 none 🌑 manual		💿 all 🌑 none 🌑 manual			o all o n	one 💿 manual	o all ● no	one 🔵 manual
Canon DIGITAL IXUS 80 IS		100-400mm F5-6.3 DG OS HS		<b>Z</b>	✓ ≤8		<b>∀</b> ≤ 8	
Canon EOS 100D								
Canon EOS 200D		✓ 18-150 mm			✓ ± 12		⊻ ≤ 12	
Canon EOS 250D		 ✓ 23 mm f/2						
Canon EOS 600D		✓ 33 mm f/2	3				≤ 20	
Canon EOS 6D		✓ 4.3-215.0mm			<b>⊻</b> ≝ 50	3	<b>≥</b> ≤ 50	11
Canon EOS 6D Mark II		Canon DIGITAL IXUS 80 IS			<b>⊻</b> ≝ 70	8	☑ = 70	
Canon EOS 70D		Canon EF 100mm f/2.8L Mac			<b>⊻</b> ≝ 100		<b>⊻</b> ≝ 100	
Canon EOS 7D Mark II		Canon EF 16-35mm f/4L IS			<b>⊻</b> ⊴ 150		<b>⊻</b> ≝ 150	
Canon EOS 80D		Canon EF 24-105mm f/4L IS			<b>⊻</b> ≝ 200		☑ ≤ 200	
Canon EOS 90D		Canon EF 300mm f/4L IS US			<b>⊠</b> ≝ 300		<b>⊠</b> ≝ 300	
Canon EOS M5		Canon EF 40mm f/2.8 STM			<b>⊻</b> ⊴ 400		<b>⊻</b> ≤ 400	
Canon EOS RP		Canon EF 50mm f/1.8 II			✓ > 400		✓ > 400	
Canon PowerShot SX50 HS		Canon EF 50mm f/1.8 STM			unknown		unknown	
DMC-TZ101		Canon EF 70-200mm f/4 L I						
FinePix X100		Canon EF-M 55-200mm f/4.5						
✓ X-H1	۰	Canon EF-S 18-135mm f/3.5						
✓ X-T2	8	Canon EF-S 18-135mm f/3.5						
		Canon EF-S 18-55mm f/3.5-						
X100F		Canon EF-S 24mm f/2.8 STM						
☑ X100F ☑ X100T	3							
X100F	3 0	Canon EF-S 35mm f/2.8 IS						
☑ X100F ☑ X100T		Canon EF-S 35mm f/2.8 IS						
☑ X100F ☑ X100T		Canon EF-S 35mm f/2.8 IS						

Figure 5.2: Selection after double clicking a histogram bar

## 5.4 Exclusion of files with no time information

Below the time sliders the checkbutton *Exclude invalid time stamps* is placed.

Activating this button, all images are excluded that do not have a valid time information in their EXIF data set.

Typically, those images come from very old digital cameras or from scanners (flat bed scanners or slide scanners); also downloaded image files may show this lack of information.

PFotos sets the date of those files to 1970.01.01 -- 00:00:00

Activation of this checkbutton will exclude those images and will adjust the time period of the sliders accordingly.

Unchecking this button restores the full time period.

Tiger Graphics PFotos								
File PFotos Help								
Extract Exifs Open o	lata file Cams & Le	enses Image Data	Preferences Lic	icense	Help	About	Exit	
Extract Extrs Open c	Gallis & Le	nises inage Data	Fielelelices	icense	neib	About	EAIL	
	/TIGERGRAPHICS/PFOTOSDATE	N/nature.csv						
							Show Selection	
Time Period 03.05.2008 -	21.11.2021						show selection	
							Save Selection	
Histogram			an an taobh an 🚽	<mark>.</mark>		- <b>-</b>	<b>.</b> .	
Start III								
End							П	
Exclude invalid timestamps								
Activate file name filter								
Activate file type filter								
Cameras		Lenses		Fo	cal Length (35 r	nm)	Focal Length	
💿 all 💿 none 🍥 manual		오 all 💿 none 🍚 manual			all 💿 none	💿 manual	oall on	one 💿 manual
Canon DIGITAL IXUS 80 IS	2	100-400mm F5-6.3 DG OS HS	24	ZI 🖬	1 2 8	2	✓ ≤8	2
Canon EOS 100D	22	✓ 150-500mm	12			2	v = 10	4
Canon EOS 200D	6		2					
Canon EOS 250D	4	🗹 23 mm f/2	2		1 = 14		<b>⊠</b> ≡ 14	
Canon EOS 600D	18	✓ 33 mm f/2	28		i ≝ 20	6	<b>≥</b> ± 20	8
Canon EOS 6D	54	✓ 4.3-215.0mm	2		l≝50 11		<b>⊻</b> ≝ 50	202
Canon EOS 6D Mark II	10	Canon DIGITAL IXUS 80 IS	2		1 ≝ 70 8		₩ ± 70	24
Canon EOS 70D Canon EOS 7D Mark II	28	<ul> <li>Canon EF 100mm f/2.8L Mac</li> <li>Canon EF 16-35mm f/4L IS</li> </ul>	70			6	✓ ± 100	252
Canon EOS 70 Mark II	42	Canon EF 16-35mm f/4L IS	4			4	✓ ± 150 ✓ ± 200	26
Canon EOS 90D	38	Canon EF 300mm f/4L IS US	20			8	✓ ± 200	60
Canon EOS M5	4	Canon EF 40mm f/2.8 STM	2			2	✓ ± 400	50
Canon EOS RP	66	Canon EF 50mm f/1.8 II	4		>400 11			30 📃
Canon PowerShot SX50 HS	2	Canon EF 50mm f/1.8 STM	6		unknown		🗹 unknown	
DMC-TZ101	2	Canon EF 70-200mm f/4 L I	4					
FinePix X100	2	Canon EF-M 55-200mm f/4.5	2					
₩ X-H1	196	Canon EF-S 18-135mm f/3.5	2					
X-T2	146	<ul> <li>Canon EF-S 18-135mm f/3.5</li> <li>Canon EF-S 18-55mm f/3.5-</li> </ul>	2					
X100F X100T	2	Canon EF-S 24mm f/2.8 STM	2					
unknown	0	Canon EF-S 35mm f/2.8 IS	36					
		Canon RF 35mm F1.8 MACRO	50					
		DMC-TZ101	2					
		FF-S35mm f/2.8 MACRO IS S	4					
		FF-S35mm f/2.8 MACRO IS S	4 🛙	Σ				

Figure 5.3: Exclusion of images with invalid time information activated

## 5.5 Exclusion of files in predefined directories

Below the time sliders the checkbutton *Activate directory filter* is placed. Activating this button, all files are excluded that are located in a directory from the list defined in the *Directory filter* entry in the preferences tab.

Typically, those directories are thumbnail directories or similar mostly being generated from others tools.

Unchecking this button de-activates the filtering.

• Tiger Graphics PFotos									-
le PFotos Help									
Extract Exifs Open d	ata file Cams & l	Lenses Image Data	Preferences	License	Help	About	Exit		
File /home/photo	TIGERGRAPHICS/PFOTOSDAT	(FN/pature csv							
Number of Images 416 of 784									
Time Period 03.05.2008 -	21 11 2021						Show Selection		
							Save Selection		
Histogram				. 💼 👞 🖬	L	م الطحاد	- <mark></mark>	1	
Start III									
End							Г		
Exclude invalid timestamps									
Activate directory filter									
Activate file name filter Activate file type filter									
Cameras		Lenses			Focal Length (	35 mm)	Focal Length		
• all • none • manual		all  none  manual				one 💿 manual		ione 💿 manual	
							• • • •		
Canon DIGITAL IXUS 80 IS	1	🗹 100-400mm F5-6.3 DG OS HS	12	Д	⊻ ≤8	1	⊻ ≤8		
Canon EOS 100D	11	✓ 150-500mm	6		<b>⊻</b> ≤ 10	1	<b>⊻</b> ≤ 10	2	
Canon EOS 200D	3	🖌 18-150 mm	1		<b>⊻</b> ≤ 12		⊻ ≤ 12		
Canon EOS 250D	2	✓ 23 mm f/2			<b>⊻</b> ≤ 14		⊻ ≤ 14		
Canon EOS 600D	9	✓ 33 mm f/2	14		⊻ ⊴ 20	3	☑ ≤ 20	4	
Canon EOS 6D	27	✓ 4.3-215.0mm	1		≤ 50	59	⊻ ≤ 50	101	
Canon EOS 6D Mark II	5	Canon DIGITAL IXUS 80 IS	1		⊻ ⊴ 70	43	☑ ≝ 70	12	_
Canon EOS 70D	14	Canon EF 100mm f/2.8L Mac	35		✓ ± 100	28	⊻ ≤ 100	126	
Canon EOS 7D Mark II	6	Canon EF 16-35mm f/4L IS	2		✓ ± 150	83	⊻ ≤ 150	13	
Canon EOS 80D	21	Canon EF 24-105mm f/4L IS	4		✓ ≤ 200	27	☑ ≤ 200	12	
Canon EOS 90D Canon EOS M5	19 2	Canon EF 300mm f/4L IS US Canon EF 40mm f/2.8 STM	10		✓ ± 300 ✓ ± 400	34 6	✓ ≤ 300	30 25	
Canon EUS MS	33	Canon EF 40mm f/2.8 STM	2		✓ ≤ 400 ✓ > 400	57	✓ ± 400 ✓ > 400	15	
Canon PowerShot SX50 HS	1	Canon EF 50mm f/1.8 STM	3		unknown	74	unknown	74	
DMC-TZ101	1	Canon EF 70-200mm f/4 L I	2						
FinePix X100	1	Canon EF-M 55-200mm f/4.5	1						
✓ X-H1	98	Canon EF-S 18-135mm f/3.5	1						
✓ X-T2	73	Canon EF-S 18-135mm f/3.5	1						
X100F	1	Canon EF-S 18-55mm f/3.5-	1						
X100T	14	Canon EF-S 24mm f/2.8 STM	3						
🗹 unknown	74	Canon EF-S 35mm f/2.8 IS	18						
		Canon RF 35mm F1.8 MACRO	25						
		DMC-TZ101	1						

Figure 5.4: Exclusion of images in defined directories

## 5.6 Exclusion of predefined file names

Below the time sliders the checkbutton *Activate file name filter* is placed. Activating this button, all files with root names are excluded that are from the list defined in the *File name filter* entry in the preferences tab.

Typically, those file names include *folderimage*, *icon* or other standard names from image managing tools.

Please separate the entries with a white space.

Unchecking this button de-activates the filtering.

Tiger Graphics PFotos									_ 0
ile PFotos Help									
								_	
Extract Exifs Open of	lata file Cams & L	enses Image Data	Preferences	License	Help	About	Exit	T M	
	TIGERGRAPHICS/PFOTOSDAT	EN/nature.csv							
Number of Images 774 of 784									
Time Period 03.05.2008 -							Show Selection		
							Save Selection		
Histogram				<u> </u>		· • •	. <b></b> .		
Start									
End									
End							Г		
Exclude invalid timestamps									
Activate directory filter									
Activate file name filter 🔽									
Activate file type filter									
Cameras		Lenses			Focal Length (	'35 mm)	Focal Length		
💿 all 💿 none 💿 manual		💿 all 💿 none 💿 manual				one 💿 manual		ione 🔵 manual	
							• • • •		
Canon DIGITAL IXUS 80 IS	2	100-400mm F5-6.3 DG OS HS	24	김	⊻ ≤ 8	2	⊻ ≤8		
Canon EOS 100D	22	150-500mm	12		<b>⊻</b> ≤ 10	2	<b>⊻</b> ≤ 10	4	
Canon EOS 200D	6	🗹 18-150 mm	2		⊻ ≤ 12		<b>⊻</b> ≤ 12		
Canon EOS 250D	4	✓ 23 mm f/2	2		✓ ≤ 14		⊻ ≤ 14		
Canon EOS 600D	18	✓ 33 mm f/2	28		✓ ≤ 20	6	≤ 20	8	
Canon EOS 6D	54	✓ 4.3-215.0mm	2		⊻ ⊴ 50	118	≤ 50	202	
Canon EOS 6D Mark II Canon EOS 70D	10	<ul> <li>Canon DIGITAL IXUS 80 IS</li> <li>Canon EF 100mm f/2.8L Mac</li> </ul>	2 70		✓ ≤ 70	86 56	✓ ± 70	24	
Canon EOS 70D	28	Canon EF 100mm f/2.8L Mac Canon EF 16-35mm f/4L IS	4		✓ ± 100	166	✓ ± 100 ✓ ± 150	252	
Canon EOS 70 Mark II	42	Canon EF 16-35mm f/4L IS	8		✓ ± 150 ✓ ± 200	54	I ≤ 150	26	
Canon EOS 90D	38	Canon EF 300mm f/4L IS US	20		v ≤ 200 v ≤ 300	68	✓ ≤ 200	60	
Canon EOS M5	4	Canon EF 40mm f/2.8 STM	20		≤ 400	12	≤ 300	50	
Canon EOS RP	66	Canon EF 50mm f/1.8 II	4		> 400	114	✓ > 400	30	
Canon PowerShot SX50 HS	2	Canon EF 50mm f/1.8 STM	6		unknown	90	unknown	90	
DMC-TZ101	2	Canon EF 70-200mm f/4 L I	4						
FinePix X100	2	Canon EF-M 55-200mm f/4.5	2						
☑ X-H1	196	Canon EF-S 18-135mm f/3.5							
✓ X-T2	146	Canon EF-S 18-135mm f/3.5							
✓ X100F	2	Canon EF-S 18-55mm f/3.5-	2						
X100T	28	Canon EF-S 24mm f/2.8 STM	6						
unknown	90	Canon EF-S 35mm f/2.8 IS	36						
		Canon RF 35mm F1.8 MACRO	50						
		DMC-TZ101 EF-S35mm f/2.8 MACRO IS S	2 4						
		CF-S35mm 1/2.8 MACRO IS S	41						

Figure 5.5: Exclusion of files with certain defined names

## 5.7 Exclusion of predefined file types

Below the time sliders the checkbutton Activate file type filter is placed.

Activating this button, all files of types are excluded that are from the list defined in the *File type filter* entry in the preferences tab.

Typically, those file type extensions are .html, .zip or even video data extensions.

Please always define the entries with the leading . and separate them with a white space. Unchecking this button de-activates the filtering.

Tiger Graphics PFotos									_ 0
File PFotos Help									
Extract Exifs Open dat	a file Cams & Le	enses Image Data	Preferences	License	Help	About	Exit		
File /home/photo/Tl	GERGRAPHICS/PFOTOSDATE								
Number of Images 756 of 784	GERGRAPHICS/PF0105DATE	N/ Hature. CSV							
							Show Selection		
Time Period 03.05.2008 - 21	.11.2021						Show Scicculon		
							Save Selection		
Histogram					المعمد والم		<u></u> .		
Start									
End									
							Г		
Exclude invalid timestamps									
Activate directory filter									
Activate file name filter									
Activate file type filter									
Comoros		Lenses			Focal Length (3	- mm)	Feed Length		
Cameras							Focal Length		
🗢 all 💿 none 🌑 manual		💿 all 💿 none 🍚 manual			💿 all 💿 nor	ie 🕒 manual	oall on	ione 💿 manual	
Canon DIGITAL IXUS 80 IS	2	100-400mm F5-6.3 DG OS HS	24	71	<b>▼</b> = 8	2	✓ ≤8	2	
Canon EOS 100D	22	✓ 150-500mm	12	Π	<b>v</b> ≤ 10	2	✓ ≤ 10	4	
Canon EOS 200D	6	✓ 18-150 mm	2		<b>v</b> ≡ 12		✓ ± 12		
Canon EOS 250D	4	✓ 23 mm f/2	2		<b>✓</b> ±14		☑ ±14	2	
Canon EOS 600D	18	✓ 33 mm f/2	28		✓ ≤ 20	6	✓ ± 20	8	
Canon EOS 6D	54	✓ 4.3-215.0mm	2		<b>⊻</b> ≝ 50	118	<b>≥</b> ≤ 50	202	
Canon EOS 6D Mark II	10	Canon DIGITAL IXUS 80 IS	2		<b>⊻</b> ≝ 70	86	🜌 🖬 70	24	
Canon EOS 70D	28	Canon EF 100mm f/2.8L Mac	70		✓ ± 100	56	🜌 ± 100	252	
Canon EOS 7D Mark II	12	Canon EF 16-35mm f/4L IS	4			166	✓ ± 150	26	
Canon EOS 80D	42	Canon EF 24-105mm f/4L IS	8		☑ ≤ 200	54	<b>✓</b> ≝ 200	24	
Canon EOS 90D	38	Canon EF 300mm f/4L IS US	20		☑ ≤ 300	68	☑ ⊴ 300	60	
Canon EOS M5	4	Canon EF 40mm f/2.8 STM	2		⊻ ≤ 400	12	⊻ ≤ 400	50	
Canon EOS RP	66	Canon EF 50mm f/1.8 II	4			114	≥ 400	30	
Canon PowerShot SX50 HS	2	Canon EF 50mm f/1.8 STM	6		unknown	72	🗹 unknown	72	
DMC-TZ101	2	Canon EF 70-200mm f/4 L I Canon EF-M 55-200mm f/4.5	4						
FinePix X100     X-H1	2	Canon EF-M 55-200mm f/4.5	2						
	146	Canon EF-S 18-135mm f/3.5	2						
X100F	2	Canon EF-S 18-55mm f/3.5-	2						
X100T	28	Canon EF-S 24mm f/2.8 STM	6						
✓ unknown	72	Canon EF-S 35mm f/2.8 IS	36						
		Canon RF 35mm F1.8 MACRO	50						
		DMC-TZ101	2						
		FF-S35mm f/2.8 MACRO IS S	4						

## 5.8 Histogram Bins

Below the header line of each histogram bin a set of three radio buttons *all, none* and *manual* is placed.

The button *all* selects all entries (set at start); *none* de-selects all entries at once and finally, *manual* is automatically set when one of the bin entries is de-selected by the check buttons at the histogram slots.

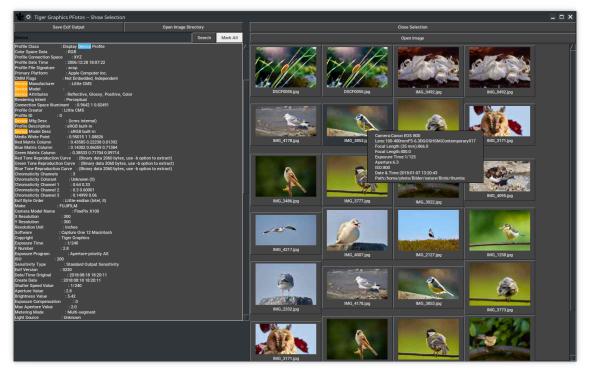
Each change of a selection initiates a new filtering and an update of **all** displayed histograms.

Applied filters persist changing between the Cams & Lenses and Image Data tab.

# 6 Image Details

## 6.1 Show Selection

Pressing the button *Show Selection* opens a new window:



On the right hand side a set of thumbnail buttons for each image in the selection is shown. This area is scrollable for a larger number of images.

Clicking on one of the these thumbnail buttons results in an update of the left column showing the complete EXIF information provided by the image (this left column is also scrollable). Putting the mouse pointer over a thumbnail image displays the short EXIF information of the image as balloon tool tip.

If the number of selected images exceeds the value given in the preferences tab for *Maximum images to show in tiled selection*, pressing the button *Show Selection* opens the new windows in the following form:

🐮 💿 Tiger Graphics PFotos Show Selectio	n		_ = ×
Save Exif Output	Open Image Dire	ctory	Close Selection
		Search Mark All	Open Image
ExifTool Version Number : 12.25			
File Name : DSCF0055.jpg	- O		
Directory : /home/photo/Bilder/nature/in th File Size : 89 KiB	e Garden/thumbs		
File Size : 89 KiB File Modification Date/Time : 2021:05:16 19:19:54+02:	0		
File Access Date/Time : 2021:05.16 19:19:34402.0			
File Inode Change Date/Time : 2021:12:24 10:02:47+01:00			
File Permissions : -rwxrr			
File Type : JPEG			
File Type Extension : jpg			DSCF0055.jpg
MIME Type : image/jpeg			
JFIF Version : 1.01			DSCF0055.jpg
Profile CMM Type : Little CMS			IMG_0492.jpg
Profile Version : 2.3.0			IWIG_0492.jpg
Profile Class : Display Device Profile			IMG_0492.jpg
Color Space Data : RGB			
Profile Connection Space : XYZ			IMG_4178.jpg
Profile Date Time : 2006:12:28 18:07:22			
Profile File Signature : acsp			IMG_3853.jpg
Primary Platform : Apple Computer Inc.			
CMM Flags : Not Embedded, Independent Device Manufacturer : Little CMS			IMG_3773.jpg
Device Model :			
Device Attributes : Reflective, Glossy, Positive,	Color		IMG_3171.jpg
Rendering Intent : Perceptual	00101		
Connection Space Illuminant : 0.9642 1 0.82491			IMG_3486.jpg
Profile Creator : Little CMS			
Profile ID : 0			IMG_3777.jpg
Device Mfg Desc : (Icms internal)			IMG_3022.jpg
Profile Description : sRGB built-in			
Device Model Desc : sRGB built-in			IMG_4095.jpg
Media White Point : 0.95015 1 1.08826			
Red Matrix Column : 0.43585 0.22238 0.01392			IMG_4217.jpg
Blue Matrix Column : 0.14302 0.06059 0.71384			
Green Matrix Column : 0.38533 0.71704 0.09714 Red Tone Reproduction Curve : (Binary data 2060 byte:	use b ention to extract)		IMG_4007.jpg
Green Tone Reproduction Curve : (Binary data 2060 byte)			
Blue Tone Reproduction Curve : (Binary data 2000 byte:			IMG_2127.jpg
Chromaticity Channels : 3	, use b option to extractly		
Chromaticity Colorant : Unknown (0)			IMG_1258.jpg
Chromaticity Channel 1 : 0.64 0.33			
Chromaticity Channel 2 : 0.3 0.60001			IMG_2332.jpg
Chromaticity Channel 3 : 0.14999 0.06			IMC 4179 inc
Exif Byte Order : Little-endian (Intel, II)			IMG_4178.jpg
Make : FUJIFILM			IMG_3853.jpg
Camera Model Name : FinePix X100			inte_cosc.jpg
X Resolution : 300			IMG_3773.jpg
Y Resolution : 300			
Resolution Unit : inches			IMG_3171.jpg
Software : Capture One 12 Macintosh Copyright : Tiger Graphics			
Exposure Time : 1/240			IMG_3486.jpg
F Number : 2.8			
Exposure Program : Aperture-priority AE		7	/ IMG_3777.jpg
Exposure rogium . Aperture priority AL			A

In the right column a set of buttons for the images in the selection is shown. The column is scrollable for a larger number of images.

Clicking one of the these buttons results in an update of the left column showing the complete EXIF information provided by the image (the left column is also scrollable).

Also the thumbnail of the image is shown on the button just being clicked.

### 6.2 Extra buttons

### 6.2.1 Open Image

Above the thumbnails in the right column, the button *Open Image* allows starting the defined image viewer for the selected image.

Note: Clicking the button Open Image starts the defined image viewer for the selected image.

Starting the image viewer for the selected image is also possible by clicking on the thumbnail but that differs for the different operating systems:

- Microsoft Windows and OpenSuse Linux : right click on the thumbnail

- MacOS : middle mouse button click with the alt (Option)-key pressed.

### 6.2.2 Close Selection

Clicking on *Close Selection* closes this window.

On top of the left columns (the EXIF information area) a row with two buttons is placed: ### Save EXIF Output Clicking the button *Save EXIF Output* stores the displayed EXIF output of the selected image to a text file in the same data directory where the **PFotos** EXIF data files are stored.

### 6.2.3 Open Image Directory

The button *Open Image Directory* starts the operating system's default file manager at the directory where the original image was found.

**Note**: In case that either the original image cannot be found or the containing directory is not accessible, both buttons, as well, as the *Open Image* button are disabled.

### 6.2.4 String search

Above the EXIF information area a search pattern can be input.

A classical search then starts to through the detailed EXIF information by pressing the *Return*-key or clicking the *Search* button right of the input field.

On the right hand side of the *Search* button the *Mark All* button toggles highlighting of all places of finding of the search pattern. The search pattern itself and the marking persist selecting another image (see above).

Input in the text field of the search pattern switches off the marking.

## 6.3 Limitations

#### Many images in the tiled selection view

Depending on processor speed, available memory and types of selected images the generation of thumbnails may take some minutes also depending of the operation system. A reasonable value to be set in the preferences tab is 40.

#### Too many images

If a selection contains more than 10000 images, an error message is displayed and the operation is cancelled.



Figure 6.1: The list of images is too long for further processing

#### Lots of images

If a selection contains more than 4000 images, a warning message is displayed but the operation may be continued. There is no risk of data corruption, at all.

But some displays (scroll lists, sliders, etc.) may show undefined behaviour.

***	Warning: veryselection list 🗸 🔺 😣
$\bigcirc$	The selection list shows 7266 entries
	This may slow down the navgigation Less than 1000 entries avoids side effects Continue anyway?
	<u>J</u> a <u>N</u> ein

Figure 6.2: The list of images is very long. Some widgets may get unstable.

#### **Empty selection**

If a selection is empty, an error message is displayed and the operation is cancelled.



Figure 6.3: The list of images is empty

#### Image not found

If an original image is stored on a network drive or a removable device which may be unavailable when looking for thumbnail and detailed EXIFs an error message is displayed and buttons which are dependent on the access to the image are disabled.

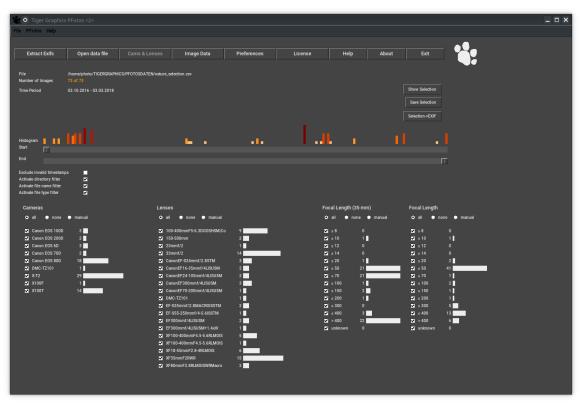
### 6.4 Save Selection

By pressing the button Save Selection opens a file selection window to save the currently generated selection of images to a **PFotos** data file for later and special use.

Tiger Graphics PFotos <2	>								_ □ >
File PFotos Help									
Extract Exifs Open	data file Cams & L	enses Image Data	Preferences	License	Help	About	Exit		
File /home/photo	/TIGERGRAPHICS/PFOTOSDAT	EN/nature.csv							
Number of Images 73 of 784									
Time Period 02.09.2016							how Selection		
							Save Selection		
							save selection		
				- L -					
Histogram									
Start				Π.					
End									
LING .					Ш				
Exclude invalid timestamps									
Activate directory filter		1	Set CSV filename		_ 0 ×				
Activate file name filter						1			
Activate file type filter		Verze	ichnis: /home/photo/	TIGERGRAPHICS/PFOTOSI	DATEN - 🏠				
Cameras		Lenses	019-11-10.csv	C2Bilder_selection.csv	mutaet.cev	<i>'</i>	Focal Length		
• all • none • manual			ntipesto.csv	C2Bilder_selection2.csv		manual		one 💿 manual	
			ilder.csv	C2Bilder_timeofday.csv					
Canon DIGITAL IXUS 80 IS			ildschirmschoner.csv	Header.csv	Neuer Ordner.cs	•	⊻ ≤8		
Canon EOS 100D	3		2Bilder.csv	Malevil.csv	pfotos.csv		<b>⊠</b> ≤ 10	1	
Canon EOS 200D	2	i lo loo liin	2Bilder_ab2017.csv	Masters.csv	pfotostmp.csv		⊻ ≤ 12		
Canon EOS 250D		✓ 23 mm f/2			Þ		⊻ ≤14	0_	
Canon EOS 600D	0	✓ 33 mm f/2	Database and		On state and		☑ ± 20	2	
Canon EOS 6D Canon EOS 6D Mark II	3	<ul> <li>4.3-215.0mm</li> <li>Canon DIGITAL IXUS 8</li> </ul>	Dateiname: nature_sele	scuon	Speichern		✓ ± 50 ✓ ± 70	41 1	
Canon EOS 70D	2	Canon EF 100mm f/2.	n des <u>T</u> yps: csv (*.csv	)	- <u>A</u> bbruch		v ≤ 100 v ≤ 100	2	
Canon EOS 7D Mark II	0	Canon EF 16-35mm f/ Zel	ge versteckte Datelen une	d Verzeichnisse			✓ ± 150	1	
Canon EOS 80D	18	Canon EF 24-105mm f/4L IS	2		<b>v</b> ≝ 200 1		☑ ≤ 200	1	
Canon EOS 90D	0	Canon EF 300mm f/4L IS US	3		<mark>⊯</mark> ≝ 300 0		<b>⊻</b> ⊴ 300	5	
Canon EOS M5		Canon EF 40mm f/2.8 STM			<mark>⊯</mark> ≝ 400 3		<b>⊠</b> ⊴ 400	13	
Canon EOS RP		Canon EF 50mm f/1.8 II			✓ > 400 22		☑ > 400	6	
Canon PowerShot SX50 HS	۰_	Canon EF 50mm f/1.8 STM	۰_		unknown 0		🗹 unknown		
DMC-TZ101	1	Canon EF 70-200mm f/4 L I	1						
<ul> <li>FinePix X100</li> <li>X-H1</li> </ul>		<ul> <li>Canon EF-M 55-200mm f/4.5</li> <li>Canon EF-S 18-135mm f/3.5</li> </ul>							
X-T2	29	Canon EF-S 18-135mm f/3.5							
X100F	1	Canon EF-S 18-55mm f/3.5-							
X100T	14	Canon EF-S 24mm f/2.8 STM	3						
unknown	0	Canon EF-S 35mm f/2.8 IS	0						
		Canon RF 35mm F1.8 MACRO							
		DMC-TZ101	1						
		FF-S35mm f/2.8 MACRO IS S	2						

## 6.5 Integration of an external ExifToolGUI

As soon as and only if in the preferences tab an external **ExifToolGUI** has been defined a new button *Selection->EXIF* appears.



The big difference is that the **PFotos** function *Show Selection* just displays the Exif information of the images, whilst sending over the selection to the external **ExifToolGUI** may deliver the original images to a tool that is capable to modify, erase or correct Exif data. So take care when doing so.

This section shows the integration of the **ExifToolGUI**<sup>1</sup> as a 'containerised' Application image on Linux. In this case simply the path to the AppImage /home/opt/jExifToolGui-1.20.0-x86\_64.AppImage was selected via *Select ExifToolGUI*.

The same method applies for Microsoft Windows.

When trying so on MacOS , we cannot come to the solution by the *Select ExifTool-GUI* button, because the navigation of the file selector does not let us select the application which is jExifToolGUI.app in the Applications directory. In this case we need to enter the complete path to the execuable jexiftoolgui which finds at /Applications/jExifToolGUI.app/Contents/MacOS/jexiftoolgui for the here presented **ExifToolGUI**.

<sup>1</sup>jExifToolGUI

<u>ר</u> ש ש → כ	View Data	View Data Copy Data Export/Import ExifTool Commands			
	• All • 0	Common Tags Google Photos 🔫 🔾 By C	Group AC3 🗢 🕞 By Camera Apple 💌		
Create previews 📃 Load metadata in foregroun	d 🚺 /home/pho	to/Bilder/nature/in the Garden/slides/IMG_28	79.jpg		
-	Group	Tag	Value		
Photo / Filename	ExifTool	ExifTool Version Number	12.25		
	File	File Name	IMG_2879.jpg		
~	File	Directory	/home/photo/Bilder/nature/in the Garden/slides		
A REAL PORT	File	File Size	320 KIB		
	File	File Modification Date/Time	2021:05:16 19:19:54+02:00		
	File	File Access Date/Time	2021:12:26 10:41:46+01:00		
1 11 1 1	File	File Inode Change Date/Time	2021:12:24 18:02:48+01:00		
	File	File Permissions	-rwxrr		
IMG_2879.jpg	File	File Type	JPEG		
	File	File Type Extension	jpg		
	File	MIME Type	image/jpeg		
	File	Exif Byte Order	Little-endian (Intel, II)		
A	File	Current IPTC Digest	0834f570b36adaa64fad5e34cc82e041		
	File	Image Width	1920		
	File	Image Height	1280		
	File	Encoding Process	Baseline DCT, Huffman coding		
IMG_1191.jpg	File	Bits Per Sample	8		
IMG_1191.Jpg	File	Color Components	3		
	File	Y Cb Cr Sub Sampling	YCbCr4:2:0 (2 2)		
A NUMBER OF TAXABLE AND	JFIF	JFIF Version	1.01		
Arr	JFIF	Resolution Unit	inches		
	JFIF	X Resolution	326		
	JFIF	Y Resolution	326		
	ICC_Profile	Profile CMM Type	Little CMS		
	ICC_Profile	Profile Version	2.3.0		
IMG_6724.jpg	ICC_Profile	Profile Class	Display Device Profile		
IMI0_0724.Jpg	ICC_Profile	Color Space Data	RGB		
	ICC_Profile	Profile Connection Space	XYZ		
and the second se	ICC_Profile	Profile Date Time	2006:12:28 18:07:22		
	ICC_Profile	Profile File Signature	acsp		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ICC_Profile	Primary Platform	Apple Computer Inc.		
	ICC_Profile	CMM Flags	Not Embedded, Independent		
	ICC_Profile	Device Manufacturer	Little CMS		
and the second se	ICC_Profile	Device Model			
IMG_6719.jpg	ICC_Profile	Device Attributes	Reflective, Glossy, Positive, Color		
	ICC_Profile	Rendering Intent	Perceptual		

Figure 6.4: The Main Window of the **ExifToolGUI** with a selection of more than 300 images sent over

# 7 Preferences

In the preferences tab a lot of settings are possible, so let's start from top:

18: X			Tiger Graphics PFotos	~ ^ X		
File PFotos Help						
Extract Exifs	Open data file	Cams & Lenses Image Data	Preferences	License Help About Exit		
Select Exif Data Di	rectory /home/photo	/TIGERGRAPHICS/PFOTOSDATEN		Back to PFotos Defaults Cancel Apply		
Select ExifTool	Select ExifTool					
Select ImageMagio	ck /usr/bin/mag	jick				
Select DCRaw	aw /usr/bin/dcraw					
Select ExifToolGUI	/home/opt/je	/home/opt/jexiffoolGUI/jexiffoolGUI.sh				
Select Image View						
Set System Defaul						
			Font Size			
Select Language • Directory filter: .thun			Font Size			
File name filter: fold						
File type filter: .html	-					
Maximum number of	f images to show in tile	d selection: <mark>40</mark>				
Number of columns	for tiled selection: <mark>4</mark>					
Color Scheme		Cams & Lenses Window	Image Data Window	ISO Intervals		
White		Cameras	Cameras	100 200 400 800 1600 3200 6400		
Light Grey		🖬 Lenses	Lenses	50 64 80 100 125 160 200 250 320 400		
<ul> <li>Grey</li> </ul>		Focal Length (35 mm)	Focal Length (35 mm)	Aperture Intervals		
Dark Grey		Aperture	Aperture	Full Values: 1 2 2.8 4 5.6 8 11		
<ul> <li>Black</li> </ul>		ISO	✓ ISO	<ul> <li>Half Values: 1 1.4 2 2.5 2.8 3.5 4 4.5 5.6</li> </ul>		
Dark Green		Exposure Time	Exposure Time	Third Values: 1 1.2 1.4 2 2.2 2.5 2.8 3.2 3.5 4 4.5 5 5.6		
<ul> <li>Dark Blue</li> <li>Custom</li> </ul>		Flash	☑ Flash ■ Focal Length	Exposure Time Intervals		
	Custom     Focal Length     File type		File type	<ul> <li>Full Values: 1/8000 1/4000 1/2000 1/1000 1/500 1/250 1/125 1/60 1/30 1/15</li> </ul>		
Set Foreground Color File type Time of Day		■ Time of Day	<ul> <li>Short: 1/32000 1/16000 1/8000 1/4000 1/2000 1/1000 1/500 1/200 1/100 1/60 1/30</li> <li>Long: 1/500 1/200 1/100 1/60 1/30 1/10 1/8 1/4</li> </ul>			
Set Backround Color				Focal Length (35 mm) Intervals		
Foreground Color on Background Color				<ul> <li>Short: 8 10 12 14 20 50 70 100 150 200 300 400</li> </ul>		
Column Width	Height of Time Histo	gram		<ul> <li>Normal: 16 24 35 50 70 100 150 200 250 300 400 500 600 800</li> </ul>		
• 10	• 6			Long: 50 100 200 300 400 500 600 700 800 1000 1200 1500 2000		
• 20	• 12			Focal Length Intervals		
• 30	• 18			<ul> <li>Very Short: 2 4 6 8 10 12 14 20 50 70 100 120 150 200</li> </ul>		
Width of Lens text	Time Histogram Colo	or table		Short: 8 10 12 14 20 50 70 100 150 200 300 400		
• 25	<ul> <li>black&amp;white</li> </ul>			Normal: 10 16 24 35 50 70 100 135 170 200 250 300 350 400 500		
• 35	<ul> <li>blue&amp;white</li> </ul>			Long: 35 50 100 200 300 400 500 600 700 800 1000 1200		
• 50	<ul> <li>green&amp;white</li> <li>red</li> </ul>					
	<ul> <li>red</li> <li>prism</li> </ul>					
	<ul> <li>prism</li> <li>mono</li> </ul>					

## 7.1 Environment

• Line Select Exif Data Directory

Here, please select the directory where the **PFotos** EXIF data files shall be stored or are stored.

This implies that there might be different data directories, in case of need.

The generation of a new directory from the selection dialog depends on the operating system.

It should be possible on Microsoft Windows. On Linux and MacOS a new directory entry shall be done outside the **PFotos** application.

The selected directory is shown right hand of the button, where the path can also be edited.

Line Select ExifTool

Here, please select the executable for the exiftool. The selected executable is shown right hand of the button, where the path can also be edited.

- Line *Select ExifToolGUI* Here, please select the executable for the **ExifToolGUI**. The selected executable is shown right hand of the button, where the path can also be edited.
- Line Select Image Viewer

Select an image viewer on Microsoft Windows and Linux platforms.

For MacOS , the default method open is the best selection and can simply be confirmed, but on Linux the system's default method xdg-open refers to the MIME-settings for the different image types which may lead to some strange results for RAW images, such, it is recommended to select your preferred image viewer hopefully capable to show all your cameras' RAW images.

The selected image viewer respectively the selected open method is shown right hand of the button.

Button Set System Default Viewer

Set the open method for images to the system's default. The result is shown right hand of the Select Image Viewer button.

Button Back to **PFotos** Defaults

This button resets some central settings to predefined defaults like the Exif Data directory, the Image Viewer, the Background Color and the Font Size and the histogram bin settings.

- Button Cancel
   Discards all changes in the settings and returns to the Cams & Lenses tab.
- Button Apply Applies all changes in the settings and returns to the Cams & Lenses tab.

### 7.2 Localization, User Interface and pre-defined filters

- Radio Buttons Select Language
   Select the language for the entire user interface.
- Entry line *Directory filter* Define here a list of directories from which files shall be excluded from the selection on request. Please separate the entries by white spaces.

• Entry line *File name filter* 

Define here a list of file names (file root names or parts of root names without extensions) which file names shall be excluded from the selection on request. Please separate the entries by white spaces.

• Entry line File type filter

Define here a list of file types (extensions) which files shall be excluded from the selection on request.

Please define entries always with the leading . and separate the entries by white spaces.

- Entry line Maximum images to show in tiled selection
   Define here the maximum number of images to be shown in the new tiled selection viewer.
   The default value is 40, which is a good number to start with.
   If the number of selected images exceeds this value the selection window will be displayed with a list of simple buttons and only one thumbnail will be generated at a time.
   The input value in this entry shall be a positive number limited to 100000.
- Entry line Number of columns for tiled selection
   Define here the number of columns the thumbnail tiles shall be presented.
   The input value in this entry shall be a positive number limited to 32.
- Radio Buttons Background color
   Select the background color of the entire user interface.
   The selection influences complete color schemes to provide good visibility of all information.
- The radio button *Custom* refers to the user selected colors which can be adjusted with the two buttons *Set Foreground Color* and *Set Background Color* below. The currently defined selection is shown on the label *Foreground Color on Background Color*.

**Note**: Take care for good visibility of the custom selected colors; we do not avoid selecting "black on black" or "white on white"....

But you're not lost: Control elements will possibly be unreadable but when you move the mouse pointer over them, they'll get highlighted and thus readable.

In case of a "white on white" scenario again navigate to the preferences tab and select one of the pre-defined color schemes.

**Note**: Since the apperance and operation of the color selector differs very strong between the different operating systems, we provide no description here.

- Radio Buttons Column Width Sets the available length for the histogram bars. 10 shortest; 30 longest.
- Radio Buttons *Width of Lens text*

Sets the limit for lens descriptions in the *Lenses* histogram bin. The reason is that lens descriptions by the manufacturers may get very long. 25 shortest; 50 longest.

When a lens description is clipped according to the selected setting, the full imformation is shown when the mouse cursor is put on the clipped text.

Radio Buttons *Height of Time Histogram* Sets the maximum height for the time histogram bars. 6 shortest; 18 longest.

- Radio Buttons *Time Histogram Color table* Selects a color table for the time histogram bars. Check out your preferred one. (red is nice)
- Menu Button *Font Size*: Select the font size for all text outputs in the user interface. The selected font size is shown on the button.
   Note: All selections will get effective after pressing the Apply button.

### 7.3 Information selection

- Radio Buttons Cams & Lenses Window and Image Data Window Select the information bins to be displayed in the main tabs.
- Histogram Bin Breakup

Radio Buttons for breakup settings of the numerical histogram slots for *ISO*, *Aperture*, *Exposure Time*, *Focal Length (35mm)* and *Focal Length*. Please check what suits your desires best.

# 8 Menues/Toolbar

Besides the functionality of the buttons the file menue offers the possibility to write histogram csv-files from the filtered data.

### 8.1 Rename Data file

Select an existing data file and give it a new name.

### 8.2 Save Selection

Select the storage location and file name for saving. The default location is the defined data directory.

The default file name is <name\_of\_the\_exif\_datafile>\_selection.csv.

The currently defined selection will be stored as **PFotos** datafile.

### 8.3 export to TXT

Select the storage location and file name for saving.

The default location is the defined data directory.

The default file name is <name\_of\_the\_exif\_datafile>\_export.txt.

The currently shown histograms will be stored as plain text file.

# 9 Known Issues & ToDos

We found some issues to be recognized as long as they are not solved in future versions of **PFotos**:

### 9.1 Thumbnail size

Currently, the thumbnail display size in the selection window is fixed and cannot be changed. This is on the ToDo list for future versions, but upscaling of embedded thumbnails does not look really nice.

### 9.2 Directory Browsing

Hopefully, also in a future version it shall be possible to additionally refine the selection of images by sub-directories if there would be a structure in the **PFotos** datafile or in an ad-hoc drag&drop-selection.

# **10 About**

We, Cora and Frank, are photo amateurs (nowadays called: enthusiastic amateurs) and (semi)-professional software engineers.

If you would like an impression amateurs who you are dealing with, feel free to have a look on our website (German site) TigerGraphics and our galleries at JAlbum.

The name **PFotos** is a composition of the German word for paw *Pfote* and the German word for images *Fotos*'. The paw and the name *Tiger Graphics* came up many years ago as we started with software development.

It was inspired by the book 'Oh wie schön ist Panama' written by Janosch.

The story how we came up to develop **PFotos** is written down below.

PFotos is fully developed in our free time, mainly in the christmas holidays 2017.

Thus, further add ons and bug fixes will take some time (at least until next christmas).

So feel free to do it by yourself under the GNU public license.

If you have any questions, please contact us by eMail (no social media available).

### 10.1 PFotos - how it began ...

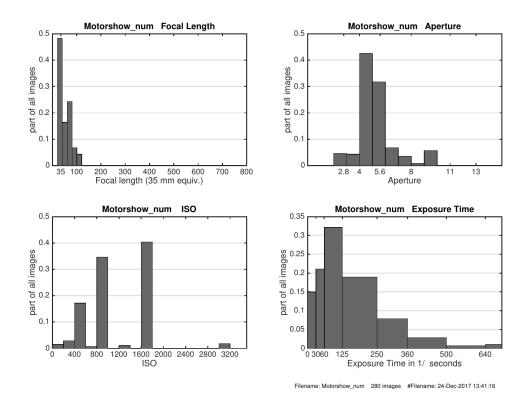
It was in 1992 as we coded the software packages  $CEMoS^1$  and  $MoViE^2$  at the university. 25 years later, in 2017, a completely different problem appeared.

We planned to visit the Essen Motorshow again after 2013 and 2015 and some questions raised.... Which cameras and lenses shall we take with us?

Which ones did we take with us the last times?

Some hours struggeling with Matlab and 1000 dirty words later we had the result in the paws:

<sup>1</sup>CeMoS <sup>2</sup>MoViE



But gathering those information should be quite more easy, more universal and comfortable. Thus, we remembered the good old times at the university: 'Let's do it in Tcl/Tk'. Short sketches outline the project and in November 2017 we started:

Cool !	(CONDIC) ANTICIANCES
DSCF 1258.P	Descritorisans Signal PFOTOS BURNESS
1560 1684	A Prop
2 008	I wonte a gavage -
Unline >= binarry BR value & branget	terror and the second s
jugane 1358 . Court land Jush Court	
1338 1301 1244 1335 1338 1358 1358 2358 } Apobure	Sinter C
strict 5 (50 57 rich 2 track	1005 100 576
Jtx 14 t	1080 × 576

By the way: the images from the Motorshow are quite nice:



Figure 10.1: Online Album