



ISSUES IN SEARCH IN PRIVATE PHOTO ALBUMS

DMYTRO NIKULIN

AGENDA

- 1. Why is it interesting ?
- 2. Multimedia types and attributes.
- 3. Multimedia IR systems requirements.
- 4. What do we have to help us right now ?
- 5. Is there any issue?
- 6. What to do if metadata does not exist?
- 7. Linking photo to author.
- 8. Linking photo to event.
- 9. Q&A.

WHY IS IT INTERESTING ?



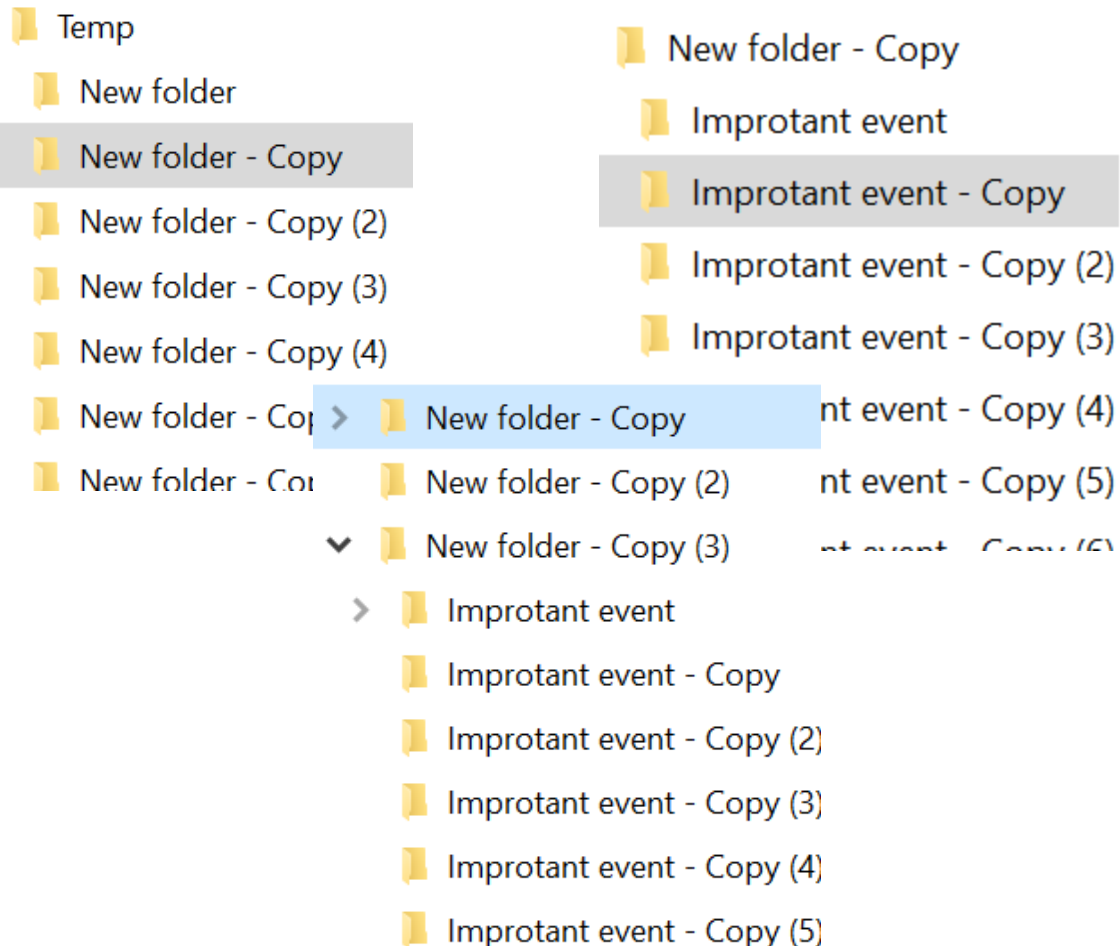
- It is predicted there will be 1.43 Trillions of photo by the end of 2020 taken annually.
- Why so many ?
- More then 4 billion of people will have a built-in camera in a phone.
- If one person takes 10 photo per day – it is 3650 per year – and it will add 14 trillions photo annually.
- More realistically if it is 3 photo per day, 1000 images in one year – and more than one trillion per year.

WHY IS IT INTERESTING ?



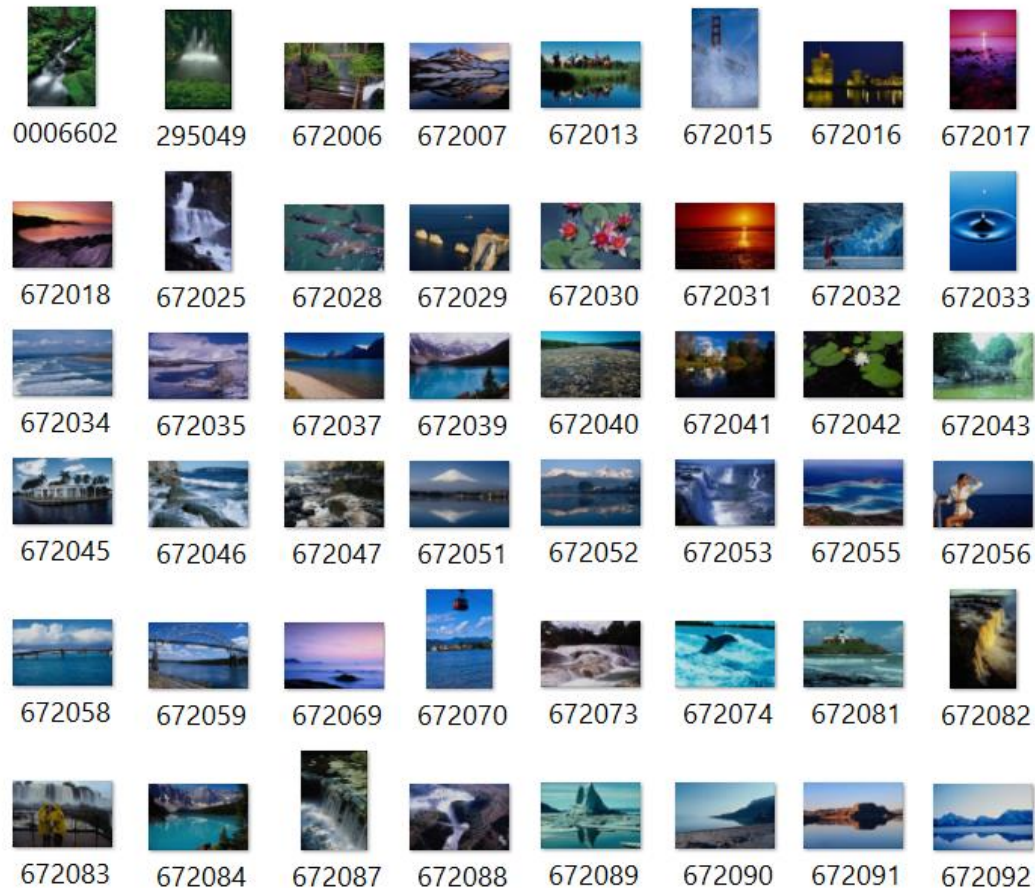
- Let's assume an average family consists of 3 persons.
- Let's assume a family owns 2 devices with a camera.
- In average day let us think this family takes 10 photo (sometimes it might be 0 but sometimes it might be hundreds)
- So usually the family can take more than 3 thousands photo annually.
- 10 years – 40 thousands.

WHY IS IT INTERESTING ?



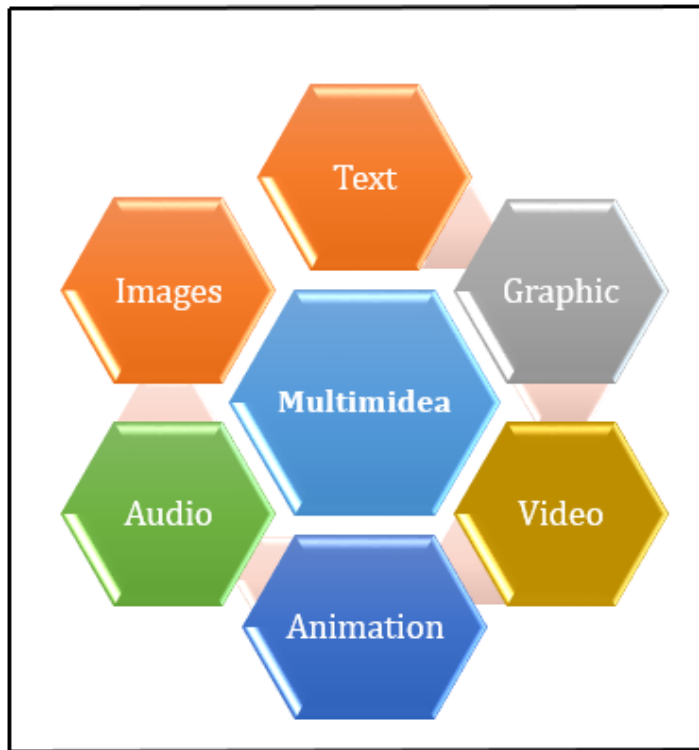
- Let's imagine how usually a search in 30 thousands photo album looks like.
- One person – I know that we are looking for a photo in a folder with name “important event”.
- Other person – I do remember it should be also in folder named like “new folder” bla-bla.
- Aha, there are several folders with name “new folder” and several with name “important event” (.
- Ohh, we will find it but not today.

WHY IS IT INTERESTING ?



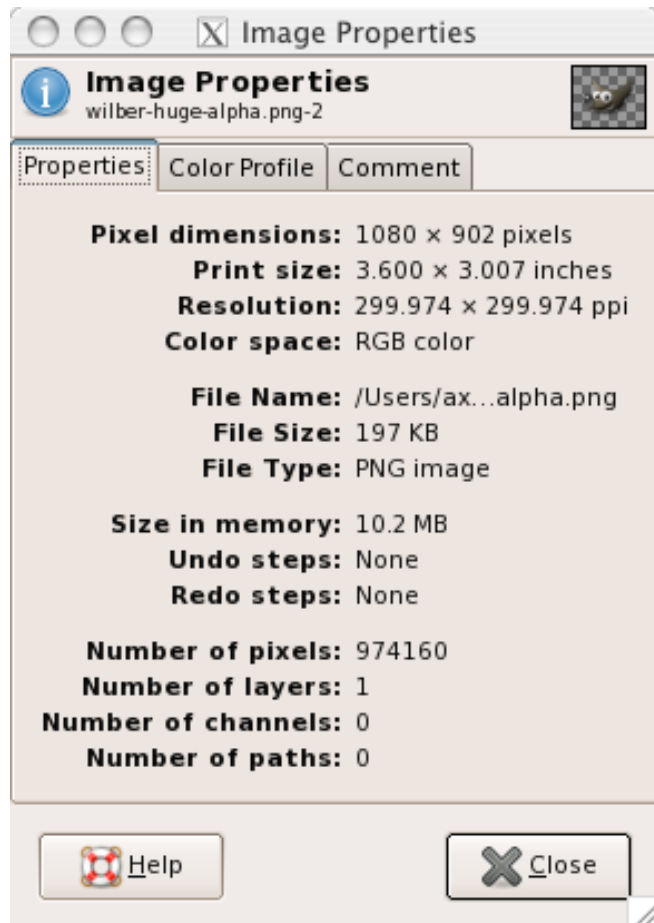
- So if family has a lot of multimedia content
- And if, unfortunately, that family does not have a good tool to search through the photos
- The process of finding of target photos might be very difficult

MULTIMEDIA TYPES AND ATTRIBUTES



- Static content :
 - Text;
 - Graphic;
 - Images;
- Dynamic content:
 - Audio;
 - Animation;
 - Video.
- We will focus on images (aka photo) here.

MULTIMEDIA TYPES AND ATTRIBUTES



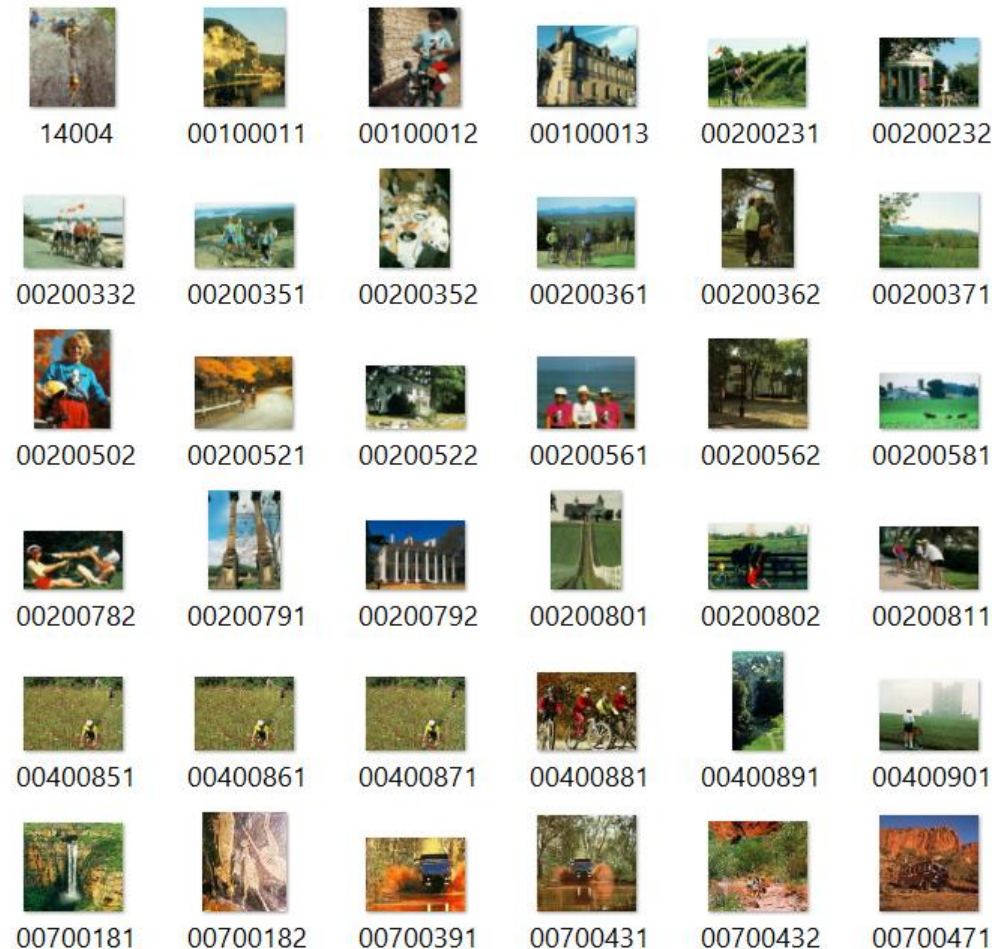
- Examples of image attributes/properties are: Aperture, Camera make, Camera model etc.
- There are a lot of properties/attributes of photo but let us focus on those that might be used in search by usual people.

MULTIMEDIA TYPES AND ATTRIBUTES



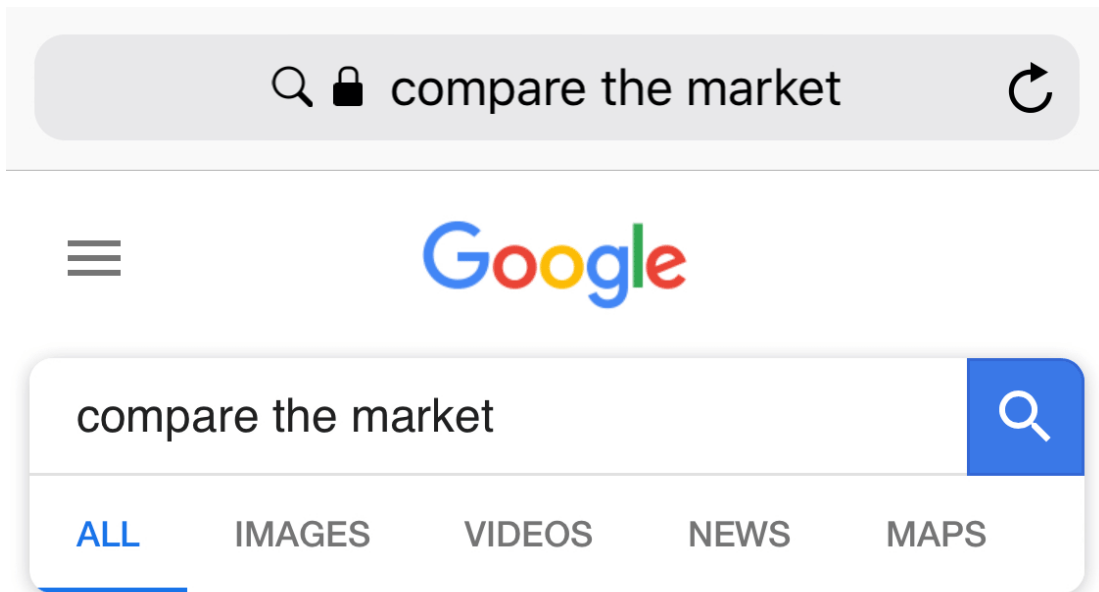
- Data and time when it was taken (e.g. 2020/04/20 21:22:21);
- People on it (e.g. my father, friend);
- Place it was taken from (for instance longitude + latitude or “my parent’s home”);
- Objects on it (forests, pets, cars);
- Events description (my father birthday, trip to London)
- Photo author

MULTIMEDIA IR SYSTEMS REQUIREMENTS.



- It should provide a container to keep different types of multimedia;
- It shall be possible to represent any kind of multimedia information (photo, video and audio);
- It shall provide a simple way to edit the multimedia data;
- It should provide a possibility to search through the content in fast and easy way;
- It should provide the filtering of information by several set of criteria's;
- Relevance feedback shall be implemented;
- Indexing and cataloguing shall be provided;
- Query the information by example of image;
- Browsing via search results shall be implemented.

MULTIMEDIA IR SYSTEMS REQUIREMENTS.



- It is clear how to keep the multimedia but what requests to search can be there?
- Lets provide the examples basing on multimedia properties/attributes that can be used by usual people.

MULTIMEDIA IR SYSTEMS REQUIREMENTS.



photo with my grandmother

Все

Картинки

Видео

Новости

К

Результатов: примерно 160 000 000 (0,67 сек.)

Картинки по запросу my grandmother

shiba inu

vintage

their grandparents

baby

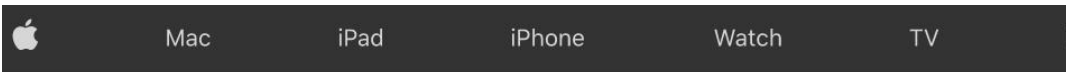
fan



→ Другие картинки по запросу "my grandmother"

- Data and time, when it was taken at (e.g. 2020/04/20 21:22:21);
- People on it (e.g. my father, friend);
- Place it was taken from (for instance longitude + latitude or "my parent's home");
- Objects on it (forests, pets, cars);
- Events description (my father birthday, trip to London);
- Commentary (any text comments);
- Rating or marks (from 0 to 10);
- A combination of color, texture (a lot of blue (like sky));
- Emotions attached to a photo (smiles etc);
- By similar photo.

WHAT DO WE HAVE TO HELP US RIGHT NOW ?



Organize and find your photos

Keep your growing photo and video library organized and accessible. Browse curated views in the Photos tab, then use the Search app. Browse curated views in the Photos tab, then use the Search app. Browse curated views in the Photos tab, then use the Search app.



- Mylio - <https://mylio.com/>
- Google photo - photos.google.com
- Apple photo - photos.google.com
- Synology Moments
- digiKam
- And a lot of at <https://www.pixpa.com/blog/photo-organiser>

WHAT DO WE HAVE TO HELP US RIGHT NOW ?

Tool	Works with photo metadata(date/time + geo data)?	Face recognition functions(to say if it grandma or)?	Objects recognition functions?	Has a Link to Event description ?
Mylio	Yes	Yes	No	Only by tagging
Google photo	Yes	Yes and No	No	Only by tagging
Apple photo	Yes	Yes and No	No	Only by tagging
Synology Moments	Yes	Yes	Yes	Only by tagging
https://tika.apache.org/	Yes	No	No	?

IS THERE ANY ISSUE?

**IT'S OK, I'M NOT
SATISFIED, BUT IT'S
OK,.**

QUOTEHD.COM

Thomas Grandi

- What to do if metadata does not exist?
- Not clear how to work with events?
- How to link photo to my places like home and search them?
- It is undefined how to link the identified faces (thousands) to the person entities that can be used in the search
- It is undefined how to integrate Tagging approach with other systems
- Filtering by objects (dogs/cars/trees) is not widely implemented
- It is undefined how to link the person entity to heritage tree node

WHAT TO DO IF METADATA DOES NOT EXIST?

Advanced Search - digiKam

Camera	The make of the camera	Any
	The model of the camera	Any
Lens	The type of the lens	Any
Aperture	Lens aperture as f-number	[] - []
Focal length	Focal length of the lens	[] - []
	35mm equivalent focal length	[] - []
Exposure	Exposure time	[] - []
	Automatic exposure program	Any
	Automatic or manual exposure	Any
Sensitivity	ISO film speed (linear scale, ASA)	[] - []
Exif Orientation	Find items with orientation flag	Any
Flash	Flash mode	Any
White Balance	Automatic or manual white balance	Any
White balance	Color temperature used for white balance	[] - []
Metering Mode	Method to determine the exposure	Any
Subject Distance	Distance of the subject from the lens	[] - []
	Macro, close or distant view	Any

Geographic position

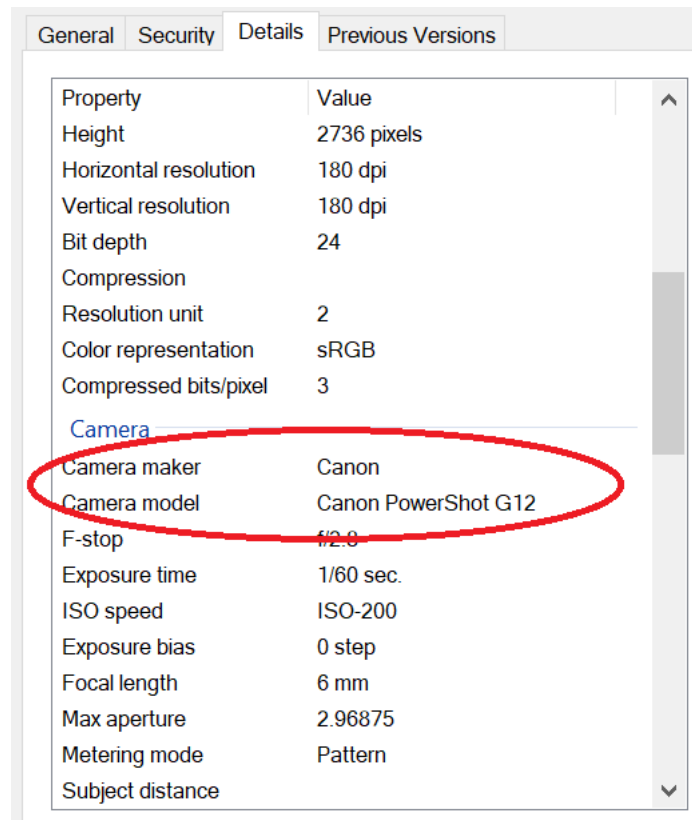
GPS Altitude range [] - []

Item has no GPS info ☒ Not Geo-located

+ Add Search Group Reset OK Cancel Try

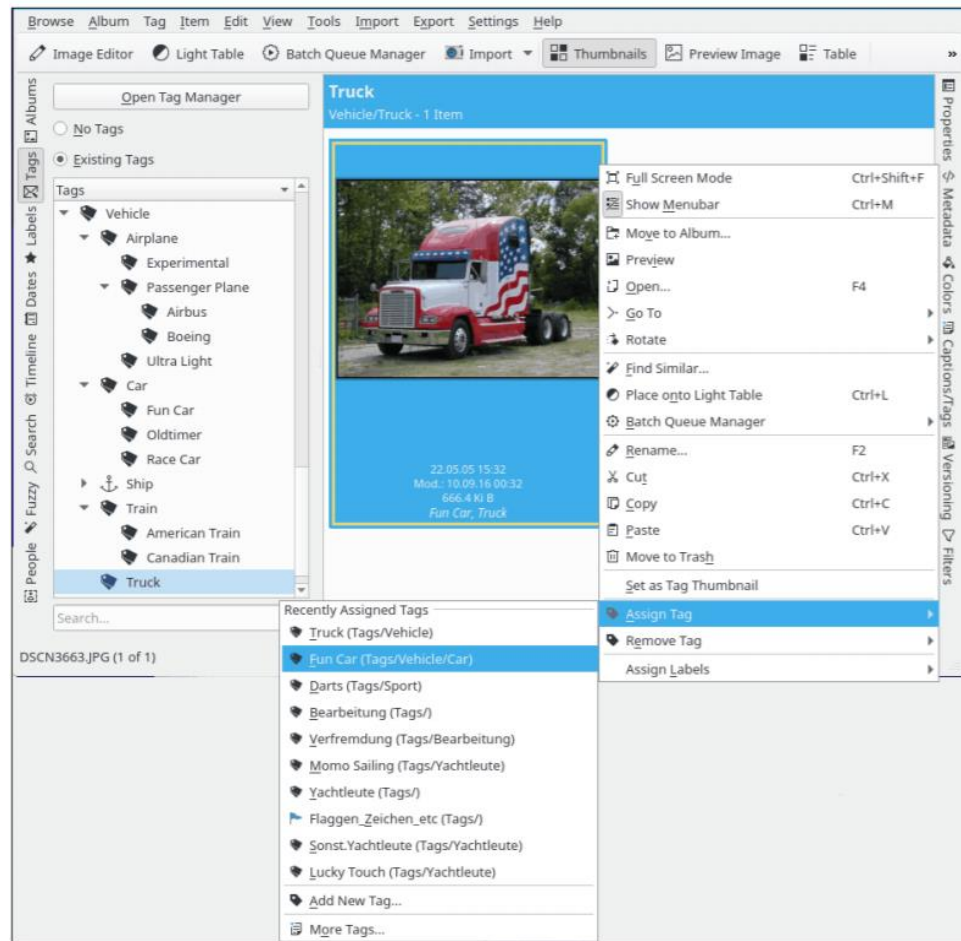
- It shall be identified first (see screenshot)
- It might be time/data taken (very important for search)
- It might be GPS metadata (also very important for search)
- Proposed algorithm to define and to update time/data taken
- Proposed algorithm to define and to update GPS data for well known places
- Proposed algorithm to define and to update GPS data for almost unknown places

LINKING PHOTO TO AUTHOR



- Proposed algorithm is based on
- Camera Maker and Camera Model existing
- Providing a dictionary “*Camera Maker*”+ “*Camera Model*” to “*author\author_name*”
- Providing a solution on what we do if “*Camera Maker*”+ “*Camera Model*” is not unique key

LINKING PHOTO TO EVENT



- Proposed algorithm is based on
- well defined tags structure
- Dividing the photos in separate folders by grouping by the same event
- For each the photo file inside of folder with same event – assign the appropriate tag for file for example by using the [digiKam](#) tool

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QUESTIONS AND ANSWERS



THANK YOU

D.NIKULIN@UKMA.EDU.UA