

A Context-Based Searching Technique by Extraction and Fusion of Metadata of Digital Photos

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Introduction



The purpose of taking Photos

The problem

Our Approach

Problem Definition



Searching for unlabeled photo

Photo with forgotten context

Human interaction to label photo

Objectives



Collect the metadata available from the photos

Extract information from available metadata of the photo

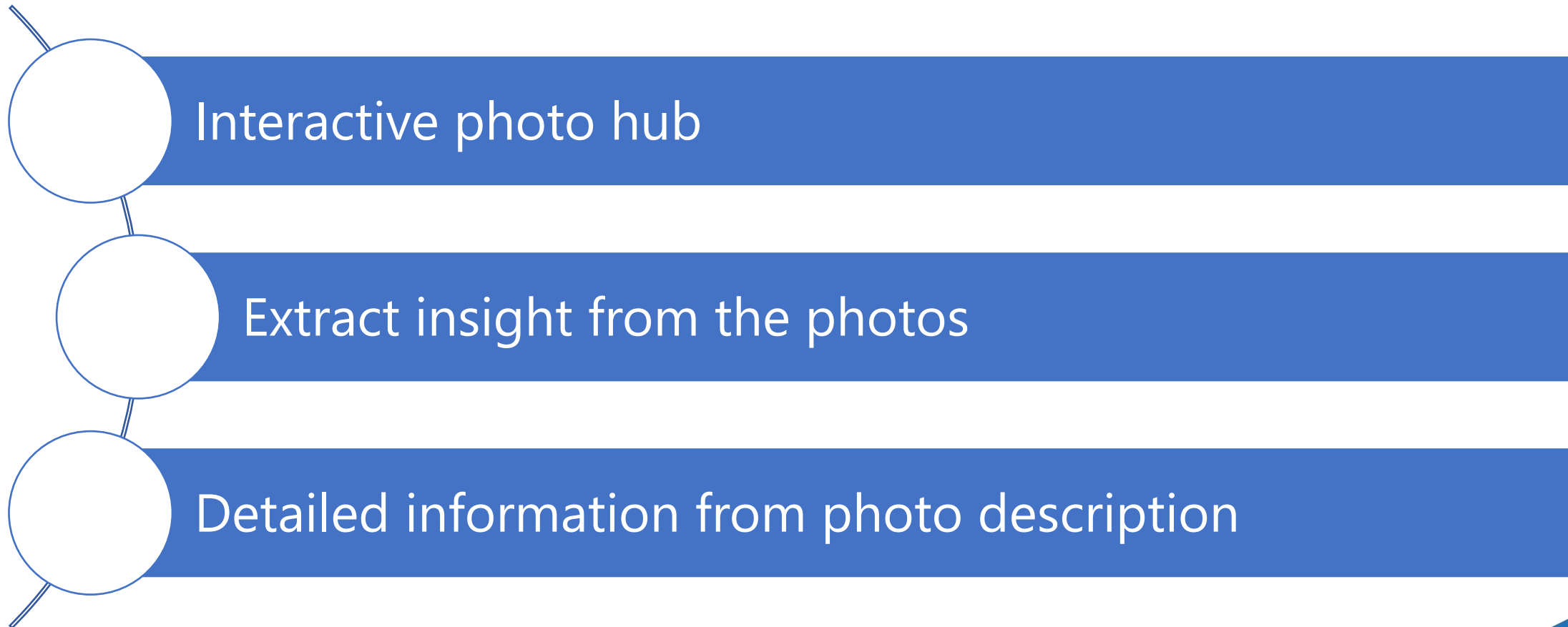
Collect weather, location, device information, detect faces, their activities etc.

Keeping the data in a Structured way.

Generate a description for the photo

Perform contextual search on photo

Application

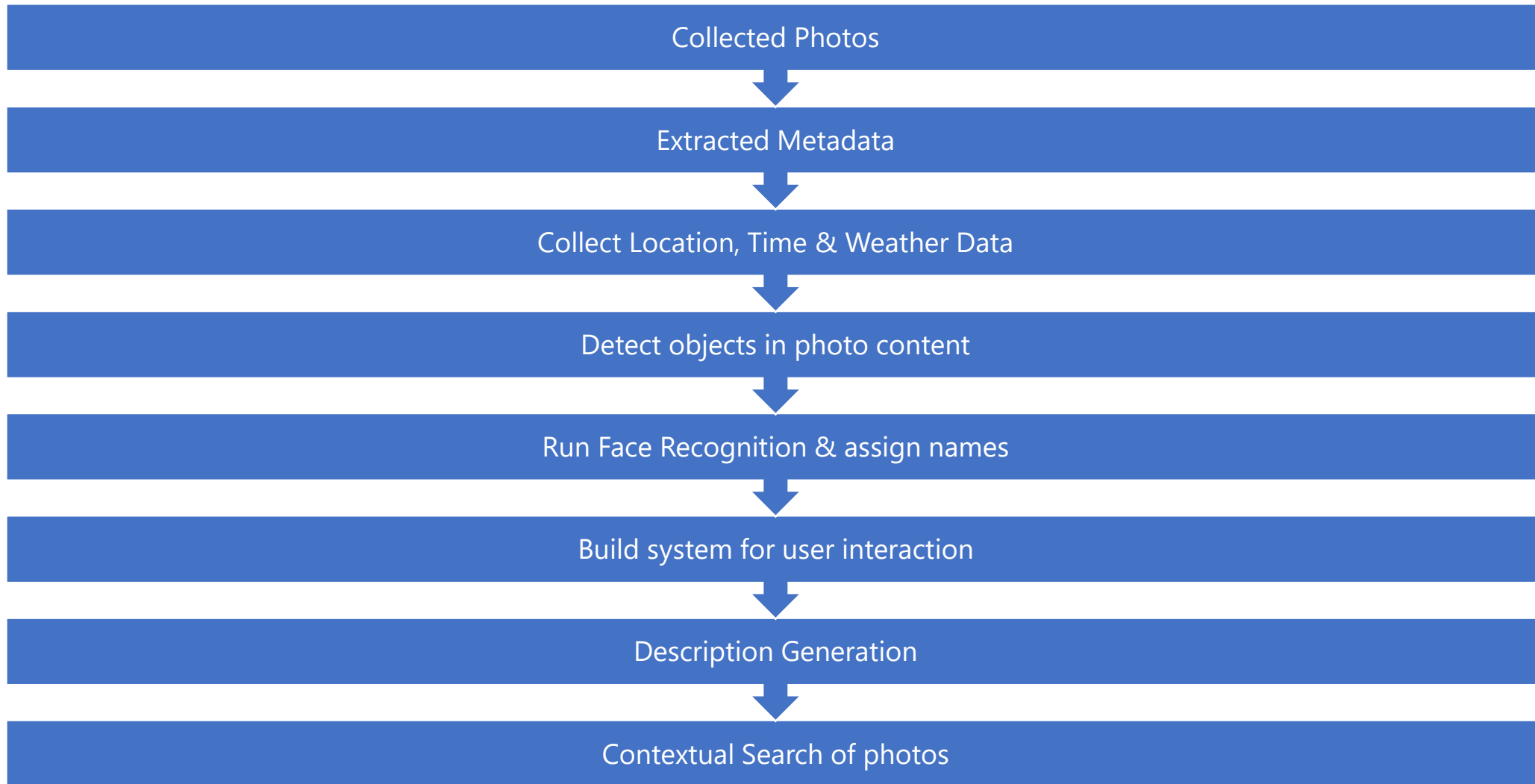


Related Works



Author & Year	Contributions
Hugo Feitosa de Figueirêdo, Yuri Almeida Lacerda, Anselmo Cardoso de Paiva, Marco Antonio Casanova, and Cláudio de Souza Baptista (2012) [1]	PhotoGeo: a photo digital library with spatial-temporal support and self-annotation.
Khandaker Tabin Hasan, Md Saddam Hossain Mukta, Mir Tafseer Nayeem, and Zahid Hasan (2012) [2]	Event-based content management by spontaneous metadata generation and diffusion.
Bongwon Suh, Benjamin B. Bederson (2007) [3]	Semi-automatic photo annotation strategies using event based clustering and clothing based person recognition.
Mor Naaman, Susumu Harada, QianYing Wang, Hector Garcia-Molina, and Andreas Paepcke. (2004) [4]	Context data in geo-referenced digital photo collections

Methodology



Data Collection

- **Collected 810 Photos from a single user's collection**
 - 189 photos were incomplete or inconsistent
 - 703 tags were generated by the system

Metadata



Device Data

- Name
- Model
- Make
- Software

Photo Data

- Exposure Time
- Flash
- Aperture
- Focal Length
- Saturation

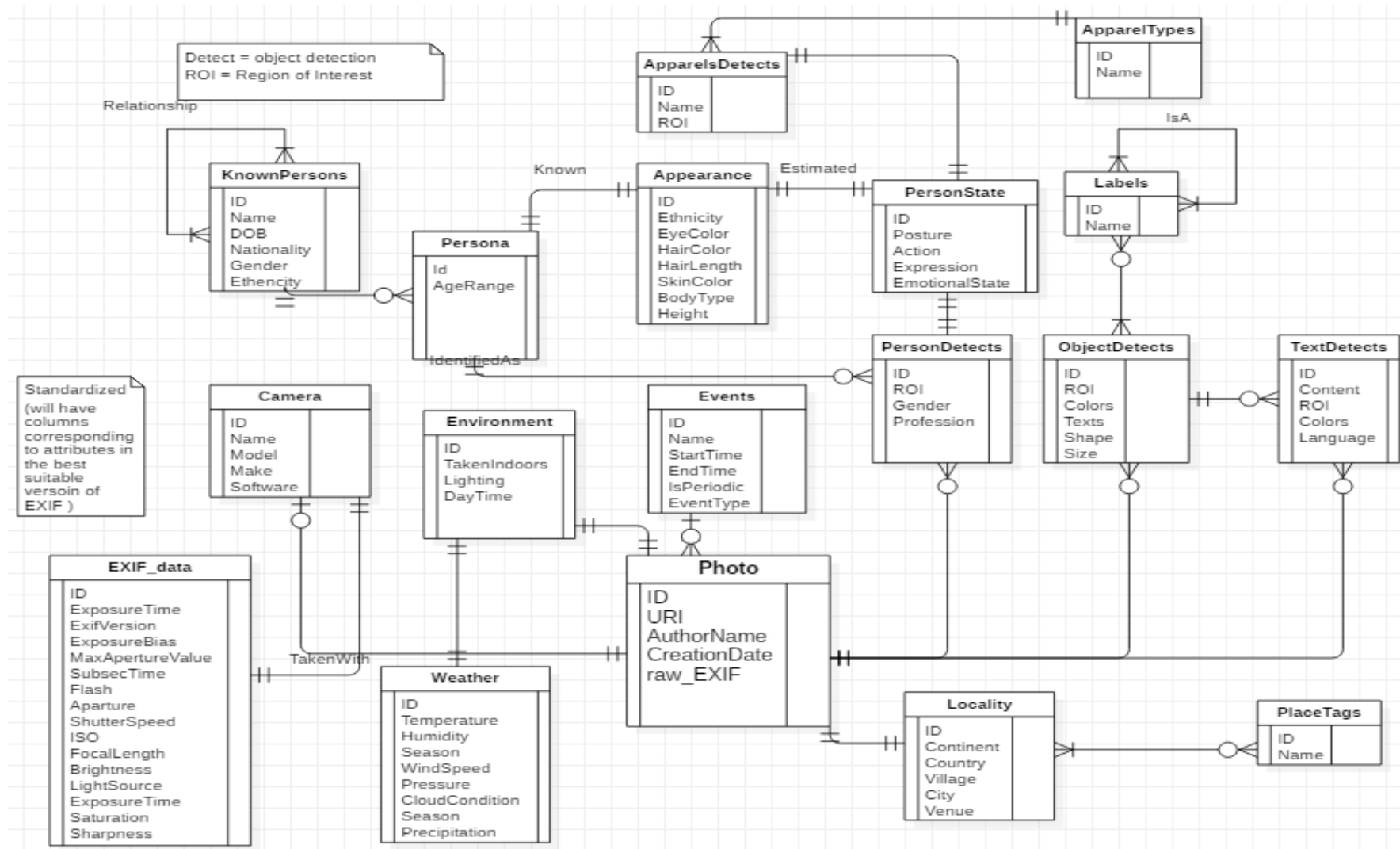
Location

- Longitude
- Latitude
- Altitude

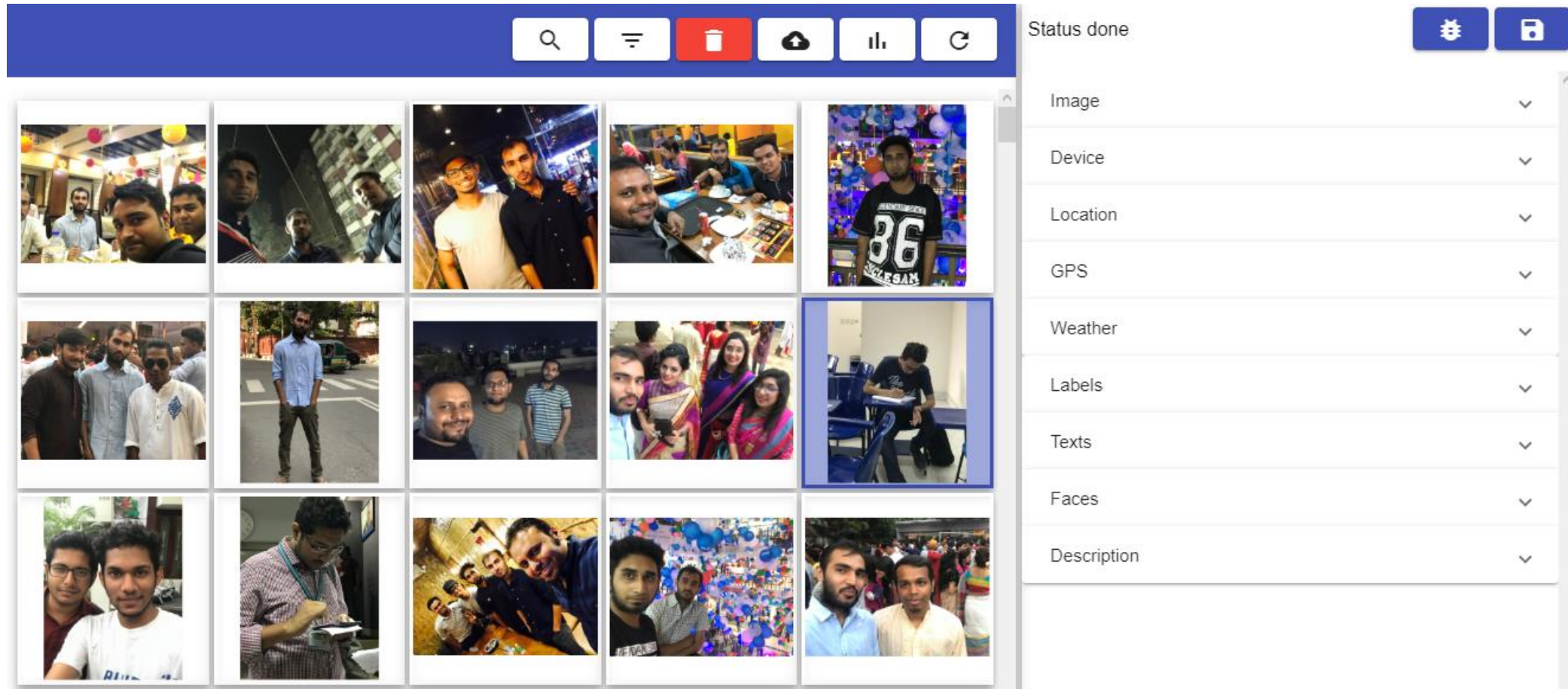
Time

- Unix time

Schema Diagram



System View



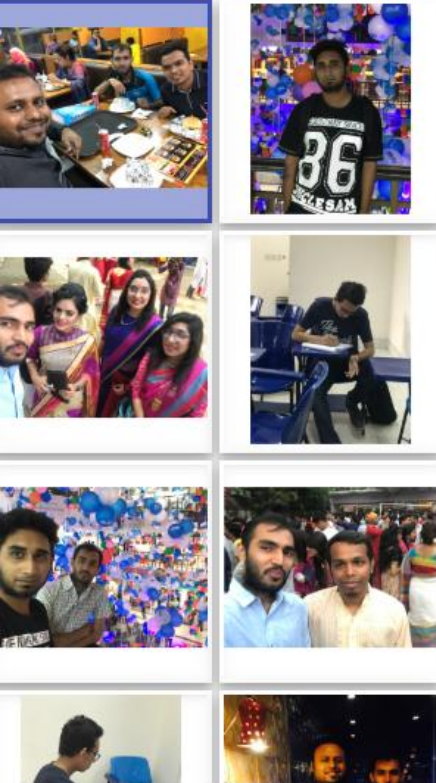
The screenshot displays a photo gallery application with a blue header bar containing icons for search, filter, delete, share, zoom, and refresh. Below the header is a grid of 15 photo thumbnails. A sidebar on the right, titled "Status done", lists various metadata categories with expandable dropdown arrows:

- Image
- Device
- Location
- GPS
- Weather
- Labels
- Texts
- Faces
- Description

System View

🗑️
📁
📊
🔄

⚙️
💾



Status done

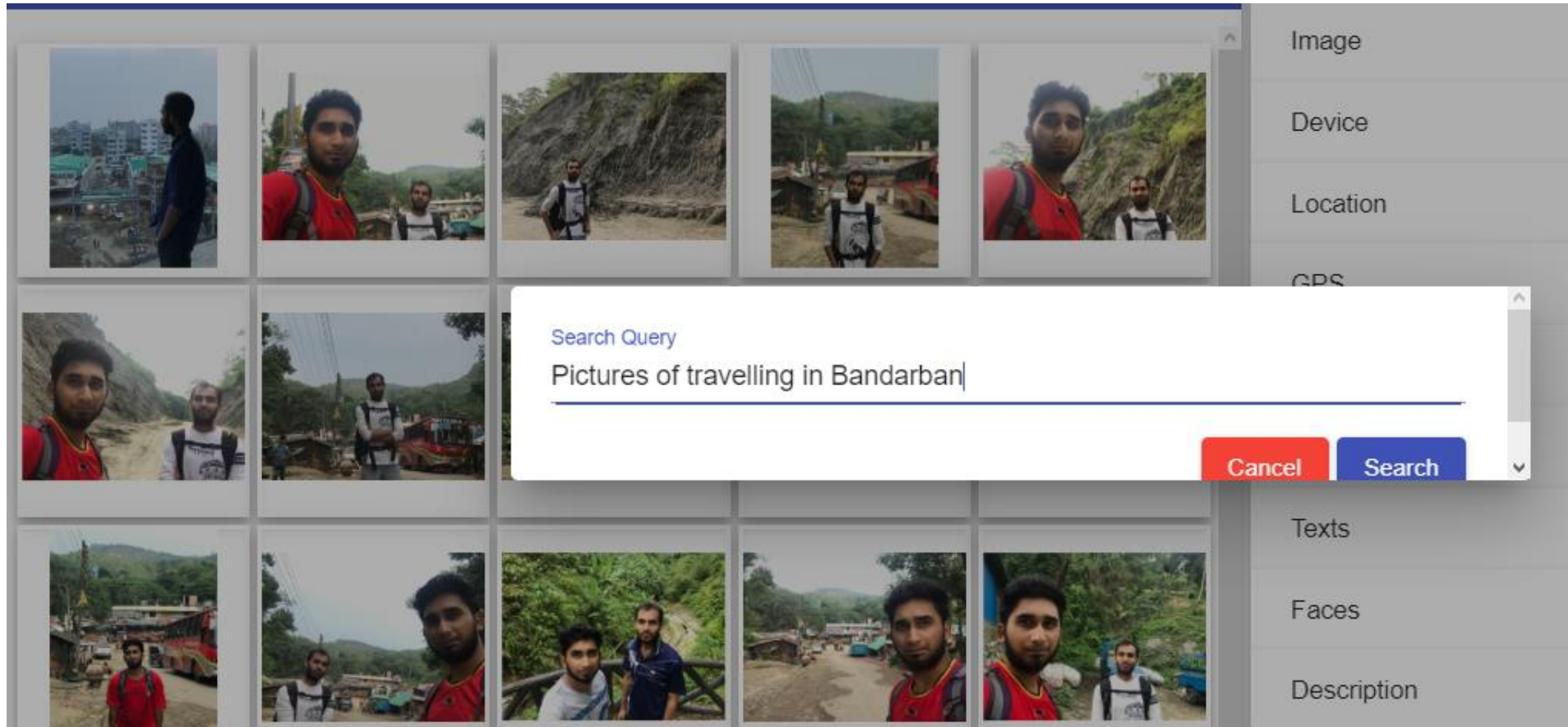
- Device ▼
- Location ▼
- GPS ▼
- Weather ▼
- Labels ▼
- Texts ▼
- Faces ▼

Description ▲

Description

The photo was taken in a hot day and in light breeze. The photo was captured using iPhone 7 Plus. It was taken at Rd No 13A, Dhaka 1212, Bangladesh. The photo was captured in 17 March, 2017 at afternoon. Mission Shourav and their acquaintances were taking selfie when the photo was taken.

System View



The screenshot shows a photo gallery interface with a grid of 15 images. A search overlay is active in the center, displaying the text "Search Query" and "Pictures of travelling in Bandarban". Below the text are two buttons: "Cancel" (red) and "Search" (blue). To the right of the gallery, a vertical menu is visible with the following options: Image, Device, Location, GPS, Texts, Faces, and Description.

Experiment Results



Query	Precision
Mission and Shourav enjoying dinner	32.1%
Pictures of rainy day in bandarban	67.6%
Nissan having dinner with Mission and Shourav.	21.2%
Mission, Nissan and shourav taking pictures together.	10.5%
Pictures of horse riding in kashmir.	100%
Photos of Mission in front of statue.	28.6%

Future Scope



Identify person

Semantic Search

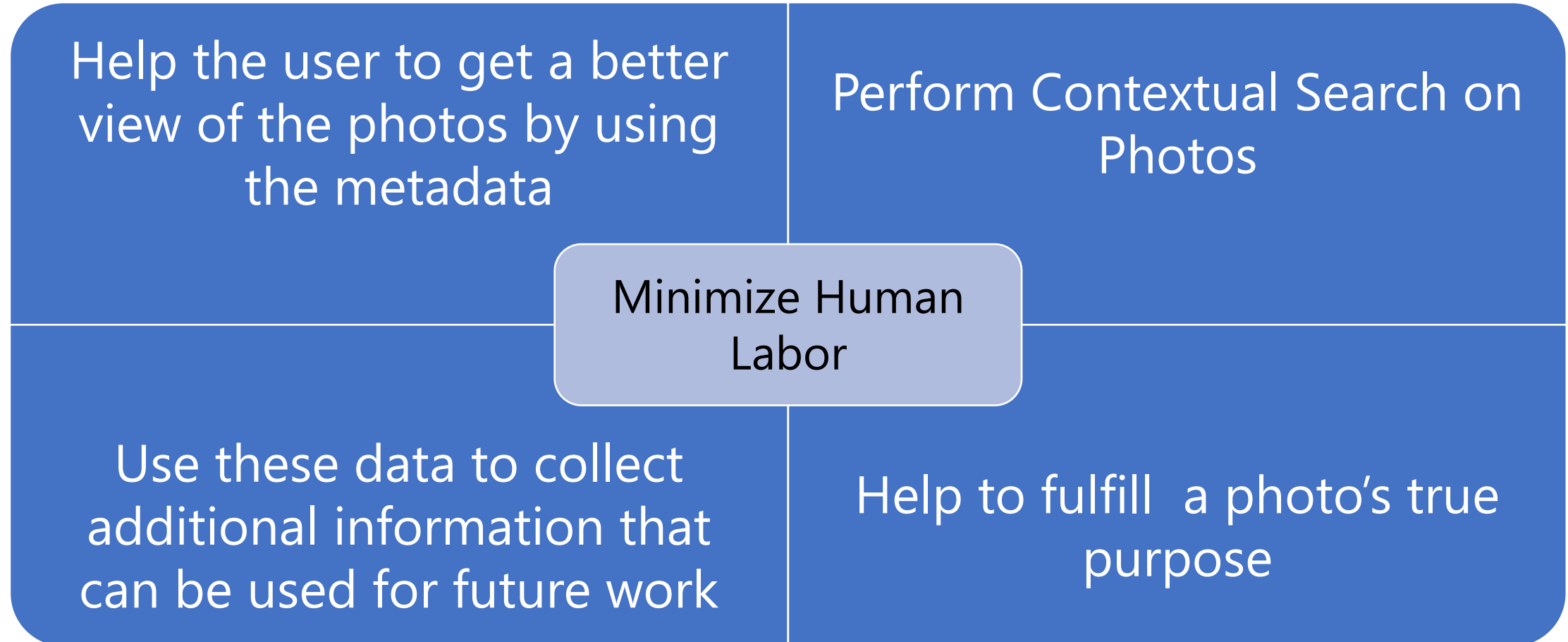
Organization of photos in a user friendly way

Sorting photos according to events, time, location and person

Metadata analysis

Multiple User Interaction

Discussion



References



- [1] Hugo Feitosa de Figueirêdo, Yuri Almeida Lacerda, Anselmo Cardoso de Paiva, Marco Antonio Casanova, and Cláudio de Souza Baptista. 2012. PhotoGeo: a photo digital library with spatial-temporal support and self-annotation. *Multimedia Tools and Applications* 59, 1 (2012), 279–305.
- [2] Khandaker Tabin Hasan, Md Saddam Hossain Mukta, Mir Tafseer Nayeem, and Zahid Hasan. 2012. Event-based content management by spontaneous metadata generation and diffusion. In *2012 IEEE 13th International Symposium on Computational Intelligence and Informatics (CINTI)*. IEEE, 97–102.
- [3] Bongwon Suh and Benjamin B Bederson. 2007. Semi-automatic photo annotation strategies using event based clustering and clothing based person recognition. *Interacting with Computers* 19, 4 (2007), 524–544.
- [4] Mor Naaman, Susumu Harada, QianYing Wang, Hector Garcia-Molina, and Andreas Paepcke. 2004. Context data in geo-referenced digital photo collections. In *Proceedings of the 12th annual ACM international conference on Multimedia*. ACM, 196–203

THANK YOU

