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Inferring Location from Geotagged Photos

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Abstract— Geotagging has become a recent phenomenon that allows users to visualize and manage photo collections in many new and interesting ways. Unfortunately, manual geotagging of a large collection of pictures on the globe is still a time-consuming and laborious task even though geotagging devices are gradually being adopted. At the same time, users often provide tag annotations, which may contain useful geographic cues, for their pictures. In this paper, I would like to explore using annotations for inferring the location of images. Using a collection of over a million geotagged pictures, I like to build location probability maps for tag annotations over the entire globe. These maps reflect the collective picture-taking and tagging behaviours of thousands of users from all over the world. Furthermore, user annotations alone can be used to infer the location of pictures with good accuracy.

Keyword — GPS, API,

I. INTRODUCTION

A fast-emerging trend in digital photography and community photo sharing is geotagging, the process of adding geographical identification metadata to various media such as websites or images and is a form of geospatial metadata. The phenomenon of geotagging has generated a wave of geo- awareness in multimedia. It can help users find a wide variety of location-specific information. For example, one can find images taken near a given location by entering latitude and longitude coordinates into a geotagging-enabled image search engine. Geotagging-enabled information services can also potentially be used to find location based news, websites, or other resources. A current key limitation to geotagging in photo-sharing websites is the manual labor involved (even though automatic geotagging using GPS receivers is gaining attention among early adopters).

GOOGLE MAPS:

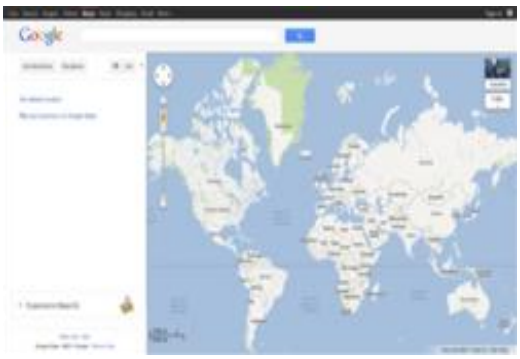

Fig: Google Maps

Google Maps is a desktop and mobile web mapping service application and technology provided by Google, offering satellite imagery, street maps, and Street View perspectives, as well as functions such as a route planner for travelling by foot, car, bicycle (beta test), or with public transportation. Also supported are maps embedded on third-party websites via the Google Maps API, and a locator for urban businesses and other organizations in numerous countries around the world. Google Maps satellite images are not updated in real time; however, Google adds data to their Primary Database on a regular basis, and most of the images are no more than 3 years old.

Google Maps uses a close variant of the Mercator projection, and therefore cannot accurately show areas around the poles. A related product is Google Earth, a stand-alone program which offers more globe-viewing features, including showing polar areas.

1) Google Maps API

After the success of reverse-engineered mashups such as chicagocrime.org and housingmaps.com, Google launched the Google Maps API in June 2005 to allow developers to integrate Google Maps into their websites. It is a free service, and currently does not contain ads, but Google states in their terms of use that they reserve the right to display ads in the future.

By using the Google Maps API, it is possible to embed Google Maps site into an external website, on to which site specific data can be overlaid. Although initially only a JavaScript API, the Maps API was expanded to include an API for Adobe Flash applications (but this has been deprecated), a service for retrieving static map images, and web services for performing encoding, generating driving directions, and obtaining elevation profiles. Over 1,000,000 web sites use the Google Maps API, making it the most heavily used web application development API.

The Google Maps API is free for commercial use, provided that the site on which it is being used is publicly accessible and does not charge for access, and is not generating more than 25 000 map accesses a day. Sites that do not meet these requirements can purchase the Google Maps API for Business.

II. LITERATURE SURVEY:

GEOTAGGING:

Geotagging is the process of adding geographical information to various media in the form of metadata. The data usually consists of coordinates like latitude and longitude, but may even include bearing, altitude, distance and place names. Geotagging is most commonly used for photographs and can help people get a lot of specific information about where the picture was taken or the exact location of a friend who logged on to a service.

Making and preserving geographical associations with pictures is an age-old process. During the "film-camera" days, people would write the place where the picture was taken on the back of the print. Today, a user can map his pictures precisely using systems such as Google™ Picasa™, Google Earth, and Yahoo Flickr.

With the massive volume of digital imagery being captured and shared on the Web, and the phenomenon of geotagging having acquired phenomenal proportions, it has become a recent research trend to explore computer vision algorithms to link user-tags, visual content of pictures, and community knowledge with the geographic locations where the pictures were captured. An important research question that motivates our current work is how this massive volume of community geotagged image data can be leveraged for assigning geographic locations to images, especially legacy pictures that were taken before cameras could interface directly with GPS receivers. In an automatic geotagging algorithm based on simple K-nearest-neighbor visual search to infer geo-association of images was described. The basic premise explored is that the visual content of pictures and their geographic locations are correlated. The strength of the system lay in a simple technique and the availability of a very large-scale image database (~6 million images) for search. In our recent work , we built upon and studied the question of incorporating both tag annotations in addition to K-nearest-neighbor visual search to refine the geo-inference.

In this paper, the goal is to understand the information that tag annotations provide in the context of recognizing the geolocation of an image. To this end, we analyze geographic distributions associated with tags with standard tools to examine information content: frequency, and mutual information. Experiments have shown that user annotations alone can be used to infer the location of pictures accurately. We show that the geographic probability distribution of a tag relates to the semantic meaning of the tag itself and we can effectively determine which tags are cities or nations by examining the tag maps themselves. Eventually, we expect better fusion of user annotations with visual content to lead to much improved geo-location inference.

Geotagging and map-based Web activity involves location, which is supported by geographic space, i.e. elements of the earth's surface and near-surface that are generally considered at a larger scale than table-top objects. Geographic space constitutes a vast and open environment in which human activities take place, all of which include elements that can be part of the user's context. We believe tags are a good candidate to reflect this diversity. Indeed, tags can designate categories at any level of generality (e.g. animal, dog), actions (e.g. hiking, snowboarding), global or subjective attributes and affordances (e.g. cheap, fun, eatable), events as well as personal designations.

As tags can describe activities as well as their results we believe that the distinction between service and context can be blurred: invoking a service is itself a task, and therefore a part of a wider context. Hence, there is continuity between the environment, the agent, and its behaviour, that actual systems fail to reproduce. In the following we present a framework based on dynamic processes, in which we believe context can be represented more naturally, i.e. as continuous with the other elements of the environment. This continuity is represented by relations between the tags, some of which have as spatio temporal meaning.

III. EXISTING SYSTEM

User Image Tags

Content understanding in images has been studied for decades in the vision research community. Recently, the research community increasingly turns to metadata and picture-taking context to solve the semantic understanding problem, for example, in . Important metadata can be collected also as a result of user participation. Photo-sharing websites such as Flickr have witnessed a surge of collaborative tagging from users. With the growing popularity of geotagging, mining, organizing, and linking geographic data to visual content has become essential.

When an image is manually tagged, the user associates annotations with the image that are descriptive and may carry information related to the location of the image. In some cases, the relationship is direct: An image tagged "Chicago" is quite probably captured in the Illinois city. However, in other cases the relationship is more subtle but still informative. For example, an image tagged "snow" is not likely to have been captured near the equator. Other tags, such as "smile", contain little information regarding the location of the image capture. The benefit of user tags is clear from Fig. 1. Even if you think you know the location of an image from the content, the tags collectively can provide valuable information. If we jumped to the conclusion that this statue is in NYC, we would be drawing a reasonable but incorrect conclusion.

While location has been used for image understanding, the inverse problem of inferring location from image content is still novel and difficult.

Statue of Liberty

Fig: Location finding using Tag Names

Problems in the Existing System:

- Location inferring using Tag Names may not produce correct results
- The original image with tag name could not find the correct location

IV. PROPOSED SYSTEM:

User Images

In this paper the user will provide the images for finding the location in the maps. The Geotagging phenomenon used here to tag the images in a particular location in the maps. The user will give some tag names to that images located in the maps. In the Existing System the location can be find out by using the user images. But in the Proposed System the user images are used for finding the location. The input image is compared with all the geotagged images in the database.

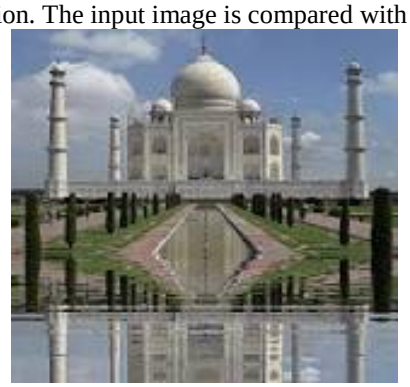

Fig: Location finding using Images

Using a collection of over a million Geotagged pictures, I like to build location probability maps for tag annotations over the entire globe. These maps reflect the collective picture-taking and tagging behaviours of from thousands of users from all over the world. Furthermore, user annotations alone can be used to infer the location of pictures with good accuracy.

Users are able to draw features directly onto a map where the borders have already been drawn, and can add features such as roads, railways, rivers and so on. In addition, users can add specific buildings and services onto the map such as local businesses and services. At first glance the site appears identical to Google Maps, and the three views (map, satellite and hybrid) are available which allow users to view the map data, satellite of the region or a combination of both.

Using the find or browse tools, contributors are able to add to and edit existing features on the map. Three kinds of drawing tools are available: place mark (a single point of interest on the map), line (for drawing roads, railways, rivers, and the like) and polygon (for defining boundaries and borders, adding parks, lakes and other large features). The approach encouraged by users and by Google is to trace features such as roads from the existing satellite imagery. This approach is not useful in areas with poor satellite imagery, and users consequently create less map data in those areas.

Contributors can assign areas of the map as their 'neighborhood', that is an area they know well enough to make detailed contributions to. Users can also moderate the contributions of others within their neighborhood. An individual's neighborhood is not visible to other users.

Map Maker Pulse is a page which shows the latest user edits live as they are updated. It comes with a basic pause/play feature for users to view edits as and when they happen.

GOOGLE MAPS IMAGE APIS

The Google Maps Image APIs make it easy to embed a static Google Maps image or Street View panorama into your web page, with no need for JavaScript. The APIs are as simple as constructing a URL with the information about your image; once the URL is loaded from an image tag, Google will create and return your map or Street View scene.

Location Parameters:

center (*required* if markers not present) defines the center of the map, equidistant from all edges of the map. This parameter takes a location as either a comma-separated {latitude,longitude} pair (e.g. "40.714728,-73.998672") or a string address (e.g. "city hall, newyork") identifying a unique location on the face of the earth.

zoom (*required* if markers not present) defines the zoom level of the map, which determines the magnification level of the map. This parameter takes a numerical value corresponding to the zoom level of the region desired. For more information, see zoom levels below

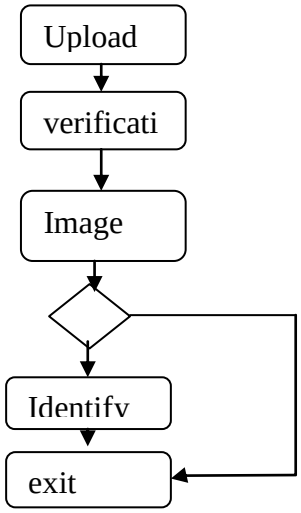

Fig: Data Flow Diagram

ALGORITHM:

Step 1: Upload the Input image.
Step 2: apply the image comparison technique on input image in data base.
Step 3: it gives the result whether the input image is in the data base or not.
Step 4: if the input image is found then location will be display on the maps.
Step 5: otherwise it gives the alert message.

V. EXPERIMENT RESULTS

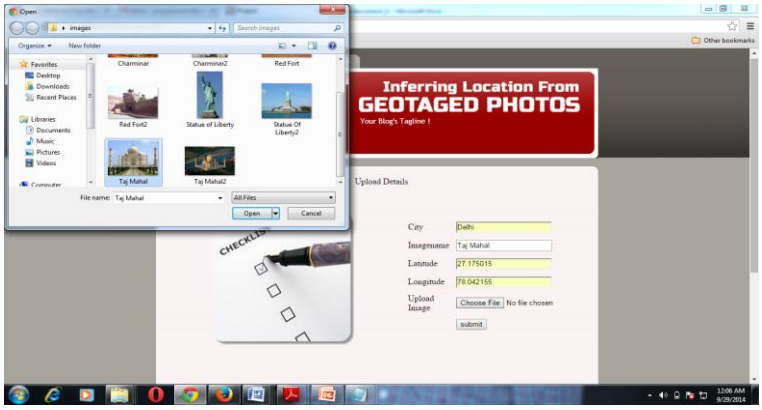

Fig: Geotag the image in the map

Fig: Upload Image

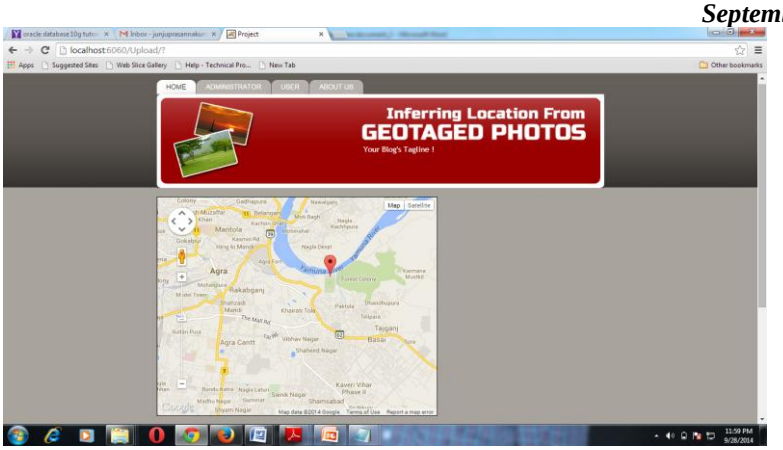

Fig: Display the Image Location in Map

VI. CONCLUSION

In this Paper we will find the location by using some of the images only. Image tags contain information related to the location of an image capture. We show that effective geolocation is accomplished by examining the tags of an image. Further, in future the location finding can be done with more and more images very effectively and visually.

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