A LEGITIMATE CHALLENGE IN HAZARD REPORTING SYSTEM IN PUBLIC SECTOR- A REVIEW

RAUT PRASHANT, BANKAR PRAMOD, INGAWALE NARAYAN, SHINDE POONAM

ABSTRACT

Recently, GIS studies of urban space areas have been increasing in number. Development in GIS-based decision support tool to model planning scenarios related to the creation of new green cities in India. For that we propose a novel system such that we need to capture real time images of hazardous objects with their location and sync it with the server. The data captured from android will be shown on Google Maps using Google Maps API v3. This data will be available to corresponding departments of government. In existing system, people do not have any central platform where they can report all their issues. So government does not understand the exact problem and their location. In Proposed system, we are developing one central platform where all issues can be reported with their location to respective departments. The objective of the system is to send the images, audio or video related to issue to the respective departments of the governments. We are sending this using the web services and android device. Using this system, we can keep track of the ratio of complaints registered and issues which are unsolved.

KEYWORDS: *Android phone, Web-Based GIS System, Real-Time Field Data Collection*

I. INTRODUCTION

Now a days, people are facing some social problem, but government cant take action on problems because government does not understand where is exact problem. With the development of communication technology, more and more digital devices, such as smart-phones, offers global positioning system (GPS) integration. The Global Positioning System (GPS) is allows the user to specify observational contribution solution to reliable GPS data analysis. In which GIS data Collection is one of the important tasks for many spatial information users.

So GIS data collection include many data such as remote sensing data and field data collection. The remote sensing data is a sub-field of Geography. In modern usage, the term generally refers to the use of sensor technology to detect and classify objects on Earth. Here field data collection is also be a part of GIS data collection. Field data collection is a first step for spatial information users. Field data collection is required for many reasons, like Ground Control Points (GCPs), ground truth data collection and gathering public opinions. The data field data collection also required for spatial data analysis or decision making. Currently, the GPS information of social images has been widely used in many applications like searching images, localization and content browsing. By using the GPS information users are upload images is helpful for improving tagging performance.

The GPS is used a web map services(WMS) to access google maps data through GIS application using HTTP interface. It can provide google map image data to any GIS applications which is used a WMS service for hazard data. We use the local feature to determine accurate GPS location. The main contribution are as follows: 1) Building a hierarchical structure for tagged dataset by using GPS information. 2) Proposing hierarchical global feature and local feature based on GPS. 3) Adopting inverted file structure and selection of images for each GPS location to estimate speed and accuracy.

We use hand-held device such as smart-phones, mobile phones which is offers more advance computing ability and connectivity than phone with contemporary features. They are more efficient in form factor such as size, weight, shape. More efficient storage capacity battery life and operating system as compare to desktop computers. Operating system used in phones becoming more and more compact such as i-phones and androids. Android is an open source mobile operating system provided by google.

II. LITERATURE SURVEY

Ko Ko Lwin, Yuji Murayama [1] Web-based GIS system for Real-Time Field Data Collection using a Personal Mobile Phone. This paper propose the field data collection using a GPS mobile phone and POP 3 Mail Server to collect real time geographical information. The all data can be collected and retrieved from the Web-GIS system for analysis. The below architecture can be shows the system design of field data collection using personal mobile phones.

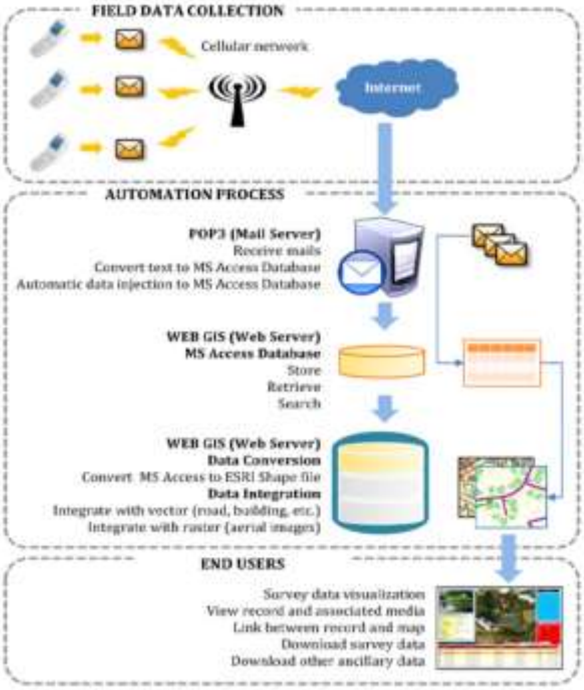

Fig 1. System design of Field data collection using personal mobile phone.

In this system, people were send the image through POP 3 Mail server system.The system is basically divided into three section 1) Data Field collection. 2) Automation process 3) End user. Data is received in mail format and conversion process was done by automatically and end user interface with Web-GIS and performing the spatial analysis through web browser. The users are required to type predefined text format for collecting data. In the fig 1 users can sent text message to a mail address by attaching photos, as many as required. Then the text message is read by POP 3 Mail server and converted it into Microsoft Access database format. As soon accessing database format then it can converted into ESRI shape file and GOS dataset such as roads, building and aerial images etc. which can shows in below fig.

Fig 2. Web-GIS for field survey data visualization in real-time

By shown in above fig users can performs GIS functions such as distance measurement within user defined search distances, labeling of attribute names, linking between survey records, maps and attached image files via Web-GIS browser.

During Field work we are required to send field data by using GPS mobile phones or reading co-ordinates from GPS. We collect the data based on specific information like location of garbage boxes, parking lots etc.

Jing Li, Xueming Qian, Yuan Yan Tang [2] GPS Estimation for places of Interest from Social users uploaded Photos. This paper propose a system of hierarchical structure to estimate the GPS location for an image. The hierarchical structure clustering divides the large-scale geo-tagged dataset into a set of small clusters. The heavy computing is reduced dramatically by confining local feature to small scale GPS location cluster. It can be utilizing images of each GPS location helps to save computational costs and improving GPS estimation accuracy.

The GPS location of an input image can obtained by comparing visual content to large scale and geo-tagged images. For matching images the GPS estimation approaches were used. To speed up the estimation process we use fast GPS estimation algorithm that uses hierarchical structure and inverted file structure for geo-tagged images. It consist of online and offline systems. The offline system aims to index the large sacle geo-tagged images. The online system estimate the GPS location of an input images.

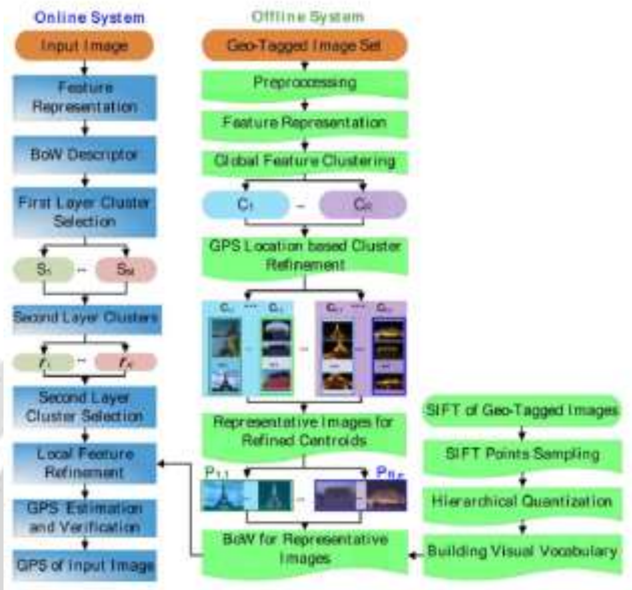

Fig.3 Architecture of GPS estimation system consists online and offline system.

In the above architecture can shows the online and offline GPS estimation system. In which the online system can be estimate the GPS of input images. Also the offline system aims at indexing the large scale gep-tagged image set.

In online system the input image can estimate as a feature representation and BoW descriptor. It also consists two layers for local feature refinement. The input images are refined in GPS estimation and verification.

The offline system can preprocess the user images as feature representation of all input images. It have only one clustering technique which is global feature clustering used as GPS location based cluster refinement. The all representative input images refined its centroids for the BoW representation of input images. The SIFT of geo-tagged images are uses the SIFT points sampling, hierarchical quantization and building visual vocabulary.

This paper can propose clustering the image dataset and using centroids in the online system. Clustering can be used for reduce computational cost and improving GPS location estimation. The representative images for each GPS location refined centroids which are shown in follow algorithm:

Algorithm: Selecting Representative images for the GPS location Refined Cluster *Ci*,*j*

Input:
All the images in *Ci*,*j* denoted set ***D***

Initial:
Pair-wise **match between every pair of** images in ***D***

Determine the number of images matching each image in ***D*** by counting the number of matching SIFT features.

Remove images without matched image from ***D***

A← the image with most matched images in ***D***

Update: *l*←1, Ω*l*←*A*, ***D***←***D—A***

While ***D*** is not null
A← the image with most matched image in ***D***
PA← Number of SIFT feature in A
For *k*=1*:l*
Count the number of matched SIFT point *nk*
Between image *A* and image Ω*k;*
end

*P**← max {n1,……n*l*}, *←arg max{*nk*}
If *P**>*PA/*2

Then image *A* can be viewed as near duplicate
with image Ω*

update: ***D←D—A***

otherwise image *A* is assigned as a representative image for the centroids,
update: *l*←*l*+1; Ω*l*←*A*; ***D←D—A***

end

Output: representative images {Ω1,…….Ω*l* }
For the GPS location refined centroid *Ci,j*

The hierarchical cluster selection, local feature matching and GPS ranking can carried by using GPS estimation. There are two steps for hierarchical cluster selection which are: First layer cluster selection and second layer cluster selection. If any image can not be matched with input image, then it is viewed as not taken at any places in the training datasets. The first layer candidate selection can be choose clusters that have similar texture patterns and colors with the input images. The top ranked centroids are selected that $M(M \leq R)$. We choose M cluster because the most similar one is based on that images with the same GPS location.

In the second layer the input image centroids can be refined via GPS location. There are total of $N = \sum_{k=1}^{M} Nk$ refined centroids for the second layer after selecting M centroids in the first layer.

There are two different ways are utilized in local feature matching to measure the similarity of the input image and the representative images. The two thechniques which are follow:

1) Similarity Measurement of Bow Histogram:- In which the normalized Bow histograms of the representative images in which refined centroid are built.
2) Similarity Measurement of Inverted file structure:- For each Bow that occurs in the input images we use obtained inverted files to compute the matching score of the Bow to the images in the selected candidates. The score is computed while considering the frequency and the weight of BoW by utilizing the well-known Term Frequency- Inverse Document Frequency technique. The score of the representative image to the input image is assigned as the sum of the scores of all the BoW.

When we use mean-shift clustering for the GPS location of the images of the selected top representative images. The estimated GPS of a given input image is taken from the offline locations, we further match the input image with representative images of the GPS location refined second layer centroids.

If the input image has image taken at the same place in the training set, the score will be low for all representative images. Then the representative images can be utilized as the standard to judge whether or not the GPS of the input image can be estimated.

Chun-Kai Feng, Thomas Johnson, Shau-Shiun Jan [3] Assessment of Camera Capture for GPS RFI Monitor. This paper can propose the GPS RFI monitor system with the modified energy measurement detection algorithm. It can be shows the two simulation on the antenna angle relative to RFI source to possible RFI sources. It can also shows the GPS RFI monitor system not only detects GPS L1 interference but also analyzes its influence on the position solution. The RFI monitor setup will be used to detect the GPS jammers.

GPS RFI monitor system flowchart is give below figure .

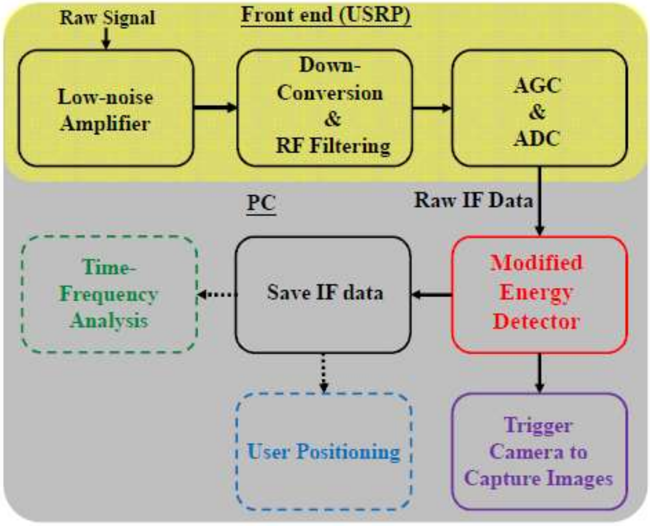

Fig 4. GPS RFI monitor system flowchart

In this flowchart GPS signal is received through GPS antenna signal is passed with low–noise amplifier (LNA) to perform signal conditioning. After that passed RF signal is converted in low IF signal by down conversion and RF filter. After that passed to ACG to adjust level, Finally IF signal is transferred digital signal by using analog to digital signal converter in general GPS Frontend the yellow region is standard signal processes. After that the raw IF data is fed into data processing computer the digital signal is computed as energy value to detected .If RFI event is occur the camera is used to save the video stream before and after triggering event. After that the IF data for the time frequency analysis and user positioning evaluation, the DPS SDR receiver is used to process the recorded IF data to perform tracking process.

Following is Architecture of Hardware setup a GPS RFI monitors.

Fig 5. Hardware Setup of GPS RFI monitors.

In this architecture the GPS RFI monitor system used an USRP N120 as a Frontend, by using Ethernet interface it is possible to record GPS IF data. The hardware system is also contained laptop with linux operating system. They also contained the NovAtel 703GGG antenna and a camera which showned in the above fig. On the software part QT was used to build the graphical user interface(GUI) to control the USRP N210 frontend and the camera in real time.

As soon the system is operational, it can capture a video frame and displays it inside the GUI. When a RFI event occurred the camera would be triggered to capture not only the six video frames before the trigger but also at least one video frame per second until the interference disappeared. If the RFI event occurs, the RFI monitor system will save the previous 40 seconds of IF data for analysis.

In this paper, the RFI detector design presented as three detector design. The important characteristics of the threshold are that it must be able to adjust itself overtime. The threshold is updated over time under nominal under conditions shows are as follow:

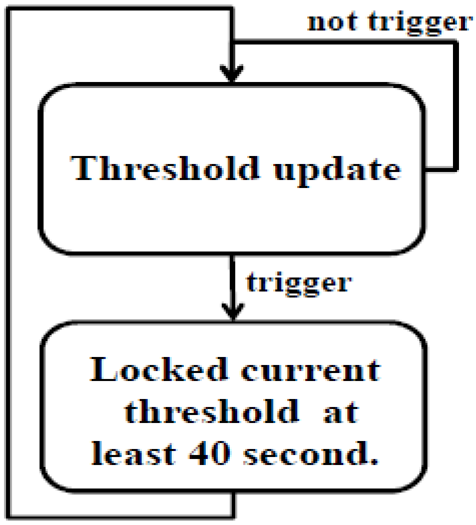

Fig 6. The threshold flowchart are update in sensitive detector.

If one RFI event occurs then the detection threshold would be locked to the value until 40 seconds after the RFI disappears. If the detector could not detect a RFI event then the detection of threshold will also affect the sensitivity of the detector. Thus the RFI detector might not work properly if it is used for a long period of time and also the detector design might not tolerate the dynamic movement because of GPS signal may be blocked by buildings.

III. CONCLUSION

This paper can developed the Web-GIS system for field data collection, which allows user to view base-maps. By using the GPS embedded mobile phones and POP 3 mail server we collect the real-time geo-spatial information from surveys. In the future, we will developed the central platform for field data in which, users will see the geo-map of the field data. Also we will collect the geo-spatial information from GPS tracker which will added to the central platform.

IV. REFERENCES

[1] Ko Ko Lwin, Yuji Murayama*," Web-Based GIS System for Real-Time Field Data Collection Using a Personal Mobile Phone "*Graduate School of Life and Environmental Sciences, University ofTsukuba,Tsukuba,JapanEmail:kokolwin@live.com,mura1@sakura.cc.tsukuba.ac.jp
Received June 18, 2013; revised July 25, 2013.

[2] Jing Li, Xueming Qian, Yuan Yan Tang, Linjun Yang and Tao Mei "*GPS Estimation for Places of Interest From Social Users' Uploaded Photos"* the
School of Electronics and Information Engineering, Xi'an Jiaotong University,
Xi'an 710049, China November 13, 2013.

[3] Chun-Kai Feng, Shau-Shiun Jan, Thomas Johnson and Dennis Akos "*Assessment of Camera Capture for GPS RFI Monitor*"
National Cheng Kung University
Tainan 70101, Taiwan and University of Colorado at Boulder, CO 80309, USA

[4] K. K. Lwin and Y. Murayama, "*Modelling of Urban Green Space Walkability: Eco-friendly Walk Score Calculator*,"
Computers, Environment and Urban Systems,
Vol. 35, No. 5, 2011, pp. 408-420.

[5] S. Mourao and K. Okadata, "*Mobile Phone as a Tool for Data Collection in Field Research*," World Academy of Science, Engineering and Technology, Vol. 70, 2010, pp.222-226.

[6] Y. Murayama, "*Systematization of Fieldwork Methodology: A Study on Capture, Management, Analysis and Circulation of Geographical Data,"* Grant-in-Aid for Scientific Research A, JSPS, 2010.