Balog : Location-based information aggregation system

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Abstract

Balog is a location-based information aggregation system with GPS-enabled mobile phones. Balog system collects location-based information via E-mail and RSS and represents it either with association with maps or with the weblog style, i.e., entries near the location displayed in reverse chronological order. We also propose representation of metadata for location embedded in RSS and its utilization.

1 Introduction

Recently, weblog sites have been increased on the Web. A weblog site (usually called blog) consists of many small entries that represent author's opinions, ideas or something what to say. Frequent update is one of the important characteristics of weblog site. It is easy for users to update their weblog contents using weblog tools such as MovableType [Six Apart]. Using of weblog tools add the other characteristic, i.e., generating RSS[RSS 2000] automatically.

On the other hand, most of people now have mobile phones equipped with many functions (e.g. Web browsing, E-mail, Digital Camera, GPS, and so on). In particular, we focus on local information around of mobile phone users.
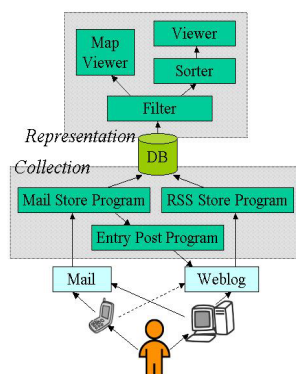

Figure 1 Architecture of Balog system

In this paper, we propose location-based information aggregation system called "Balog."[1] Balog system col-

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[1] "Ba" stands for a place or a field in Japanese.

lects location-based information created by GPS-enabled mobile phones with camera, and represents such information either with association with maps or with the weblog style, i.e., entries near the location displayed in reverse chronological order. We use mobile phones as personal input device to weblog, because weblog users often write what happens at the current moment and mobile phones are the most convenient devices on such scenes.

2 Balog system

Figure 1 is the architecture of Balog system. Balog system mainly consists of two parts: the *collection* part which extracts location-based information from E-mail and RSS, and the *representation* part which visualizes location-based information with pasting it on map or with sorting by order data.

2.1 Collecting location-based information

First, we explain the part of collecting information. Balog system has two ways of collecting information. One is via E-mail with location-based information sent by a Balog user; the other is via RSS files generated by weblog tool and collected by the Balog system.

Collecting from E-mail

Balog users send E-mail to Balog system with their accounts. These accounts are created by Balog system. Users send an E-mail with a picture that contains location-based information. In Balog system, subject of E-mail is interpreted as title of weblog entry, and body of E-mail as description of weblog entry. If the user wants to update her/his weblog site with mobile phone, Balog system updates the weblog site automatically with the E-mail received from her/him.

Collecting from RSS

Users update their weblog sites from their PC or mobile phone. Then weblog sites generate RSS. Balog system collects RSS files from those weblog sites and extracts information and pictures that described in RSS.

Location data is written in Exif [EXIF] directory in a JPEG file. A GPS-enabled mobile phone can embed location data in the JPEG file of a picture taken with a digital camera equipped with it. Balog system extracts location data from the JPEG file and registers them in a database.

2.2 Weblog tool plug-in

In order to use location data in a weblog site, we developed a weblog tool plug-in. It enables the weblog site to extract location data from JPEG files and to link Balog system with the location data. This plug-in describes location data in RSS.

Figure 2 blog-map

2.3 Representing location-based information

We developed applications that aggregate location-based information which are contained in other servers. An application called "location-blog" shows location-based information as combination of map-style and weblog-style. Figure 2 is a snapshot of this application adopted and used in 2004 JSAI (Japanese Society of Artificial Intelligence) conference for mainly the hall and restaurant guide. In this application, location-based data collected from RSS or E-mail are pasted on the map at left frame. The right frame represents information for a certain area sorted by reverse chronological order.

Users can choose the area by latitude and longitude. When accessing this application from mobile phones, users can view the area around them. In this application, we can view information that users posted. When searching information, we can use text and location data. Various users' impression about a certain area can be aggregated and can be looked through easily by users.

We can search information by location, because the Balog system can aggregate location-based information. However, Balog system uses only JPEG files with location data in Exif so far. We can search only JPEG files with entries. To search various data, we propose the way to store location data in RSS in the following section.

3. Representation of location data in RSS

We propose the following RSS format.

```
<item rdf:about="http://www.Balog.jp/~hiro/mt/archives/000335.html">
  <title>camio</title>
  <link>http://www.Balog.jp/~hiro/mt/archives/000335.html</link>
  <description>….</description>
  <dc:subject></dc:subject>
  <dc:creator>hiro-moblog</dc:creator>
  <dc:date>2004-06-12T17:21:41+09:00</dc:date>
  <dc:coverage>
    <geo:point>
    <geo:lat>35.40828</geo:lat>
    <geo:long>139.59548</geo:long>
    </geo:point>
  </dc:coverage>
</item>
```

The Balog plug-in describes location data in RSS. Using the coverage element of Dublin Core [DCMI, 1999], location data are represented with geo vocabulary [RDF Geo Vocabulary] in RSS 1.0.

As we describe location data in RSS, we can assign location data to many types of data. For example, we can aggregate sound data and make the map of sound.

Using the based_near property of FOAF [FOAF project], we can describe the place where a user usually live or work.

```
<foaf :Person>
  <foaf:name>Hiroki Uematsu</foaf:name>
  <foaf:based_near>
   <geo:point>
    <geo:lat> 35.441388888889</geo:lat>
    <geo:long>139.622975 </geo:long>
   </geo:point>
  </foaf:based_near>
</foaf:Person>
```

We can obtain much information about the data posted by users to use these metadata with their accounts. For example, there should be difference in the impression of a certain place between the users who usually live or work there and the user who come there for the first time. Using location-based information in RSS and FOAF, the Balog system can represent the difference of impression. Users can view the various viewpoint of other users.

4. Conclusion

In this paper, we proposed the location-based information aggregation system called Balog. Balog system consists of two parts that collects and represents location-based information respectively. We showed that our system could aggregate and show location-based information with various ways. In order to exploit location-based information more, we proposed the way of describing location data in RSS. We believe that it will explore more various usage of location-based information in cooperation with different systems via metadata.

References

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