Abstract

This memo describes a method of registering HTML documents with a specific geographic location through means of embedded META tags. The content of the META tags gives the geographic position of the resource described by the HTML document in terms of Latitude, Longitude, and optionally Elevation in a simple, machine-readable manner. This information may be used for automated resource discovery by means of an HTML indexing agent or search engine.

1. Introduction

Many resources described by HTML documents on the World-Wide-Web are associated with a particular place on the Earth’s surface. While resource discovery on the Web has thus far focussed on document title and open-text keyword searching, in these cases it may be beneficial...
to facilitate geographic searching. Examples of this kind of resource include pages describing restaurants, shipwrecks, retail stores etc. Consumers may use this information in order to select the closest facility, and in order to navigate towards a resource by road, on foot or by other means.

Although some resources, such as restaurants, have a street address which may be mapped to geographic location by existing tools, other objects on the Web, such as a photograph of a mountain, may not.

This draft describes a method of adding static location data to legacy HTML documents using a construct that is familiar to many HTML authors. It is intended to be concise, unambiguous, simple to use and compatible with existing editing tools. The intended use is to provide location data to Web robots that typically revisit pages every few weeks.

It is anticipated that in many cases this location data will be added manually by persons unfamiliar with GIS terminology or metadata standards. For this reason a minimal data set with few options is preferred over a more complex and extensible one.

The method described in this draft is not intended to preempt existing or future metadata encapsulation schemes which may better serve the needs of a particular community, such as geographic information systems (GIS). Nor is it intended to preempt richer, more structured data encapsulations such as RDF or XML, which typically require software to generate correctly.

2. Coordinate Systems

Resource positions on the Earth’s surface should be expressed in degrees North of Latitude, degrees East of Longitude as signed decimal numbers.

Where the precision of the coordinates is such that the datum used is significant, typically more precise than one kilometre distance, positions should be converted to the WGS 84 datum [WGS84]. Elevations, if given, should be in metres above datum. Positions given by a GPS set [GPS] with datum set to "WGS 84" will in most cases be adequate, of the order of 15 metres accuracy in horizontal position and 25 metres in elevation.

It should be noted that elevations referred to the WGS 84 geoid will in some areas differ appreciably from those measured with respect to local datum in coastal regions, which may be Mean High Water Springs, Mean Sea Level, Higher High Water or a similar reference level, and will differ substantially from "ground level". Use of elevation is
not recommended unless its value may be reliably determined.

3. Implementation

XHTML, HTML or WML markup should be added to the document in the form of a META statement. This should be placed in the document head in accordance with the XHTML specification [XHTML].

There are three GEO identifiers:
- The identifier "geo.position" is used for Latitude, Longitude and optionally Elevation data.
- The identifier "geo.region" is used for the country subdivision code from ISO 3166-2 [ISO3166-2].
- The optional identifier "geo.placename" is used for a free text representation of the position, for example "city, province" or "town, county, state".

For resources within the United States and Canada, the "geo.region" identifier as given by ISO 3166-2 is typically constructed from the 2-character country code [ISO3166] as used in Internet domain names, and the common 2-character State/Province codes [STATES][PROVINCES], joined with a hyphen, for example "CA-BC" for British Columbia, Canada.

The "geo.placename" identifier should not be used for indexing purposes, due to possible ambiguities in naming convention, language, word ordering and placename duplicates. It may be used for descriptive purposes. If an author wishes to use a street address for indexing, it is suggested that they use an Internet search engine or other tool to generate and verify latitude and longitude data from the address.

If the resource described is localized to a country or region, but not to a single point, the "geo.region" identifier may be used alone without a corresponding "geo.position" identifier.

Where the official subdivision code is unknown, or the object described is not localized within one region, the 2-character country code alone may be used in "geo.region", for example "DE" for Germany.

It is the intention of this draft to provide a means to associate a single point with an XHTML, HTML or WML document. Some consideration should be given to the choice of location when describing a resource, given that positioning mechanisms may provide an accuracy of the order of ten metres in horizontal position. For instance, when describing a retail store or small business, it may be more meaningful to give the position of the street entrance rather than
the position of the center of the property.

Although the XHTML specification [XHTML] states that the name field is in general case-sensitive, these GEO tags should be recognized by compliant agents regardless of case. Coordinates should be ordered (Latitude ; Longitude) as for RFC 2426, RFC 2445 (vCard and iCal specifications) [ICAL][VCARD]. If elevation is given, coordinates should be ordered (Latitude ; Longitude ; Elevation). (This is at variance with common GIS practice, but better matches the intended audience of this Draft.)

The Metadata Profile "http://geotags.com/geo" may be used as defined in [HTML] to define the geo tag properties.

4. Examples

```html
<head profile="http://geotags.com/geo">
  <meta name="geo.position" content="48.54;-123.84;115" />  

  describes a resource 115 metres above datum at position 48.54 degrees North, 123.84 degrees West, while

  <meta name="geo.position" content="-10;60" />  

  describes a resource at position 10 degrees South, 60 degrees East.

  <meta name="geo.placename" content="London, Ont" />  
  <meta name="geo.region" content="CA-ON" />

  describes a resource in London, Ontario, Canada, while

  <meta name="geo.placename" content="London" />  
  <meta name="geo.region" content="GB" />

  describes a resource in London, England (Great Britain).

  The HTML attributes "lang", "dir" may be used to define the language and directionality for the "geo.placename" identifier as defined in [XHTML], for instance

  <meta name="geo.placename" lang="fr" content="Londres" />
```

5. Semantics

Values for latitude and longitude shall be expressed as decimal fractions of degrees. Whole degrees of latitude shall be represented
by a decimal number ranging from 0 through 90. Whole degrees of longitude shall be represented by a decimal number ranging from 0 through 180. When a decimal fraction of a degree is specified, it shall be separated from the whole number of degrees by a decimal point (the period character, "."). Decimal fractions of a degree should be expressed to the precision available, with trailing zeroes being used as placeholders if required. A decimal point is optional where the precision is less than one degree. Some effort should be made to preserve the apparent precision when converting from another datum or representation, for example 41 degrees 13 minutes should be represented as 41.22 and not 41.21666, while 41 13’ 11” may be represented as 41.2197.

Latitudes north of the equator MAY be specified by a plus sign (+), or by the absence of a minus sign (−), preceding the designating degrees. Latitudes south of the Equator MUST be designated by a minus sign (−) preceding the digits designating degrees. Latitudes on the Equator MUST be designated by a latitude value of 0.

Longitudes east of the prime meridian shall be specified by a plus sign (+), or by the absence of a minus sign (−), preceding the designating degrees. Longitudes west of the prime meridian MUST be designated by a minus sign (−) preceding the digits designating degrees. Longitudes on the prime meridian MUST be designated by a longitude value of 0. A point on the 180th meridian shall be taken as 180 degrees West, and shall include a minus sign.

Any spatial address with a latitude of +90 (90) or −90 degrees will specify a position at the True North or True South Poles, respectively. The component for longitude may have any legal value.

The vertical coordinate (Elevation) must be expressed in meters above WGS-84 (EGM96) datum. Points having zero elevation must not have a negative sign.

5.1 Interpretation

User agents should accept metadata written according to the HTML specification [HTML].

Whitespace within a position value shall be ignored.

An interpreting agent shall internally mark position values either valid or invalid. If a position is marked invalid, it shall not be used to index or qualify the containing document.
A position having a Latitude greater than 90 degrees, or less than -90 degrees, shall be marked invalid.

A position having a Longitude greater than 180 degrees, or less than -180 degrees, shall be marked invalid.

Where a value is given for geo.region, and the latitude and longitude values given for geo.position fall outside the recognized boundaries of this region, the position may be marked invalid. For example, if a region of "US" is given for a location in the US mainland, the position may be marked invalid if the Latitude is negative or the Longitude is positive.

No formal reliance shall be placed on the precision implicit in position data. It is likely that few content providers are qualified to determine reliable precision or accuracy data, and may use position data from other sources which does not give the datum.

5.2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

6. Formal Syntax

DIGIT = %x30-39 ; 0-9
PLUS = %x2B ; +
MINUS = %x2D ; -
DECIMAL = %x2E ; .
SEMI = %x3B ; ;
CRLF = %x0D.%x0A ; return, linefeed
SP = %x20 ; space
HTAB = %x09 ; tab
WSP = SP / HTAB ;
LWSP = (WSP / CRLF WSP) ; linear whitespace
UCASE = %x41-5A ; A-Z
HYPHEN = %x2D ; -
USCORE = %x5F ; _
country = 2UCASE ; 2-letter code from ISO3166
region = 1*UCASE / 2DIGIT ; region code from ISO3166-2
TEXT = <any OCTET except CTLs, but including LWSP>
placename = 1*TEXT
delimiter = SEMI

latitude = [ MINUS / PLUS ] 0*2DIGIT [ DECIMAL *DIGIT]
longitude = [ MINUS / PLUS ] 0*3DIGIT [ DECIMAL *DIGIT]
elevation = [ MINUS / PLUS ] 0*DIGIT [ DECIMAL *DIGIT]
position = latitude <delimiter> longitude [ <delimiter> elevation ]
georegion = country [ HYPHEN / USCORE region ]

XHTML or WML syntax:
<meta name="geo.position" content="<position>" />
<meta name="geo.region" content="<georegion>" />
<meta name="geo.placename" content="<placename>" />

HTML (legacy) syntax:
<meta name="geo.position" content="<position>">
<meta name="geo.region" content="<georegion>">
<meta name="geo.placename" content="<placename>">

7. Applicability

As stated in the introduction, certain HTML documents may be associated with a geographic position, while other documents are not. For proper use of the GEO tags as described in this draft, the resource described in an HTML document should be associated with a particular geographic location for the lifetime of the document. The tags may thus be properly used to describe an object fixed on the surface of the earth (or more properly, fixed in position relative to the surface of the earth) such as a retail store, a mountain peak or a railway station. They may not be used to describe a non-localized, moving, or intangible object such as a multinational company, river, aircraft or mathematical theory.

The geographic position given is associated with the resource described by the HTML document, not with the physical location of the document [RFC1876], or the location of the company responsible for publishing or hosting the document. Thus, in some cases the country code used in "geo.region" may differ from the country code forming part of the host address in the document URL.

Since the position given is associated with the content of the document, not the author, publishing and document conversion tools should not cache position data or store it in a template.

In cases where the object being described is an area, such as a lake or a building, the position of the object should not in general be given to greater precision than the width of the object. If desired, features within the object may be described in another page and their position given with greater precision. In the case of an object such as a place of business, where only one page exists, the position of
the entrance may be given rather than the position of the centroid.

8. Security Considerations

The intended use of GEO metadata as described in this draft raises no privacy issues beyond those associated with normal use of the Web. It is assumed that information present in public Web pages has been published in accordance with applicable privacy regulations and guidelines.

If the location data is obtained from a mobile Internet device, filters applicable to possible end recipients (typically, the public Internet) should be applied. The webserver in this case acts as a Location Recipient [RFC3693].

Use of GEO metadata in a manner other than that described here may raise privacy issues. For instance, a mobile device that includes its current location in all pages served may allow the users location to be determined remotely. In such a case, the device should be equipped with appropriate encryption and access controls to ensure the privacy of the user. Specification of such access controls is outside the scope of this draft.

9. Internationalization considerations

The "geo.placename" tag content is free text, and should obey the internationalization rules of HTML 4. "lang" and "dir" modifiers may be used to specify the language of the content. Multiple instances of geo.placename may be used with different "lang" modifiers. Geo.placename content is coded using the character set of the containing document.

Geo.position and geo.region tag content should use US-ASCII or UTF-8.

10.1 Normative References


10.2 Informative References


http://www.ietf.org/rfc/rfc3693.txt

http://www.ietf.org/rfc/rfc1876.txt


[ICAL] Dawson & Stenerson, Internet Calendaring and Scheduling Core Object Specification (iCalendar), RFC 2445, November 1998
http://www.ietf.org/rfc/rfc2445.txt

http://www.ietf.org/rfc/rfc2426.txt

[STATES] United States Postal Service, Official Abbreviations - States and Possessions,
http://www.usps.gov/ncsc/lookups/abbr_state.txt
11. Acknowledgments Rohan Mahy and Patrik Faltstrom of Cisco Systems, for semantics.

12. Author’s Address

Andrew Daviel, BSc.
Vancouver Webpages, Box 357
185-9040 Blundell Rd
Richmond BC
V6Y 1K3
Canada

Tel. (604)-377-4796
Fax. (604)-270-8285
advax [at] triumf.ca
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15a. IANA Considerations
This document does not introduce any IANA considerations.