

Reliable, User-Contributed GSM Cell Tower Positioning Using Context-Aware Photos



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ABSTRACT

Data regarding the physical location of GSM cell towers is important for many practical applications. Unfortunately, such data is not freely available in many countries. We present a system, ZoneTag, where users who tag and organize their cameraphone photos on Flickr, implicitly contribute information about the physical location of cell towers. The system has been deployed on a test basis for 3 months, and currently has 125 active users. In this period, users mapped a total of 1799 cell towers to a city level or zip (postal) code level. At this rate, assuming uniform distribution of users and cell towers, 10,000 users could map every GSM cell tower in the United States in less than 10 weeks.

- 1** When the user uploads a photo from the phone and the cell tower is not yet known, the system cannot add additional location data.
- 2** The user enters the location of the photo and possibly other recent photos and photos from the same cell.
- 3** When a new photo is uploaded, the cell tower is known and the location is automatically added.

ZoneTag Usage

125 active users
 44 location updaters (35.2%)

Cell Towers Identified

349 with zipcode
 135 with city
 1799 derived*
 * location derived from the location-adjacent cell towers

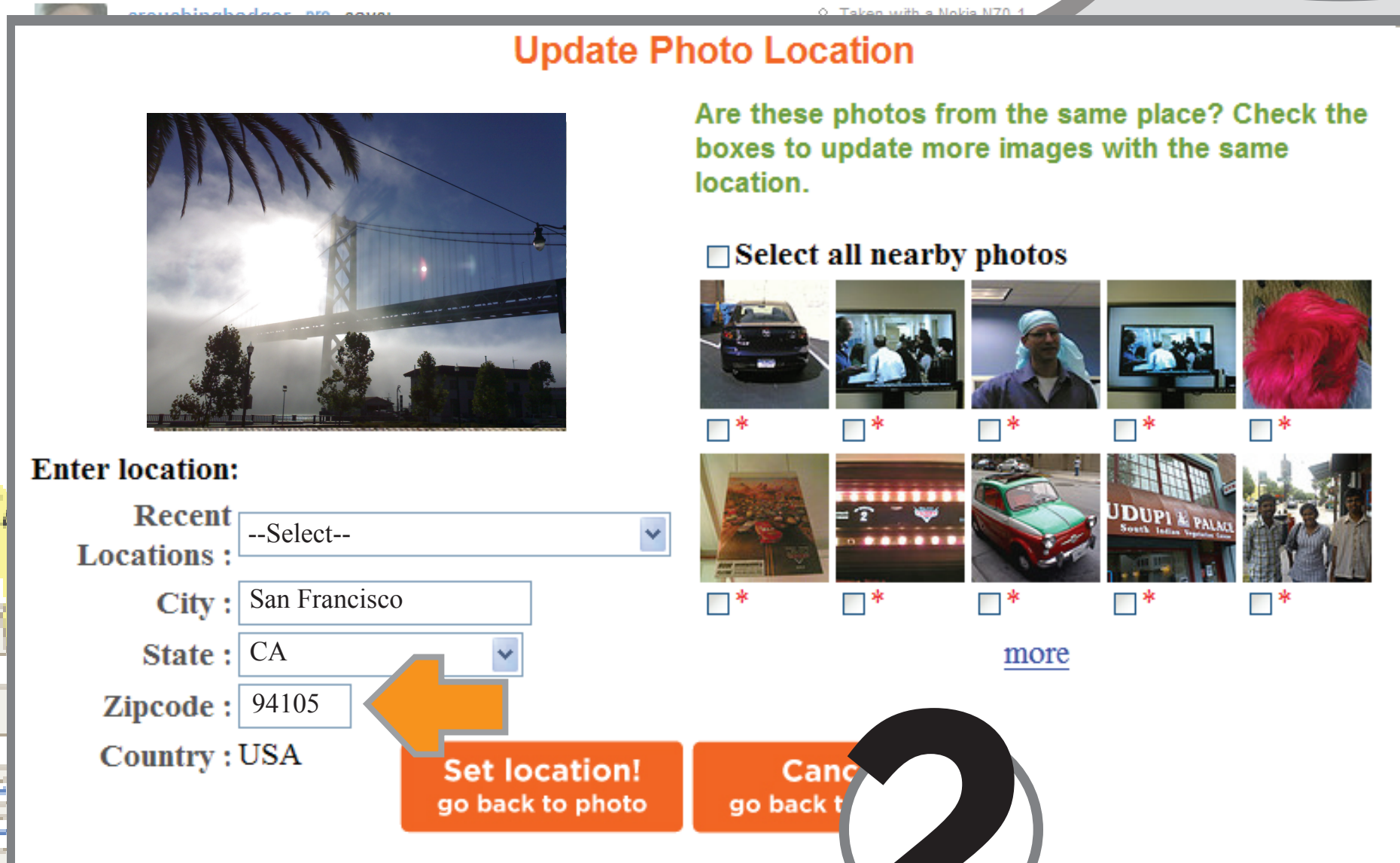
Location Statistics

Photos uploaded with location 6331 (62.9%)
 Photos with user added location 819 (8.1%)
 Current photos with location 7150 (71.0%)
 Total photos 10066

ZoneTag is a research prototype from Yahoo! Research Berkeley. To download and get the full scoop, go to <http://zonetag.research.yahoo.com>.



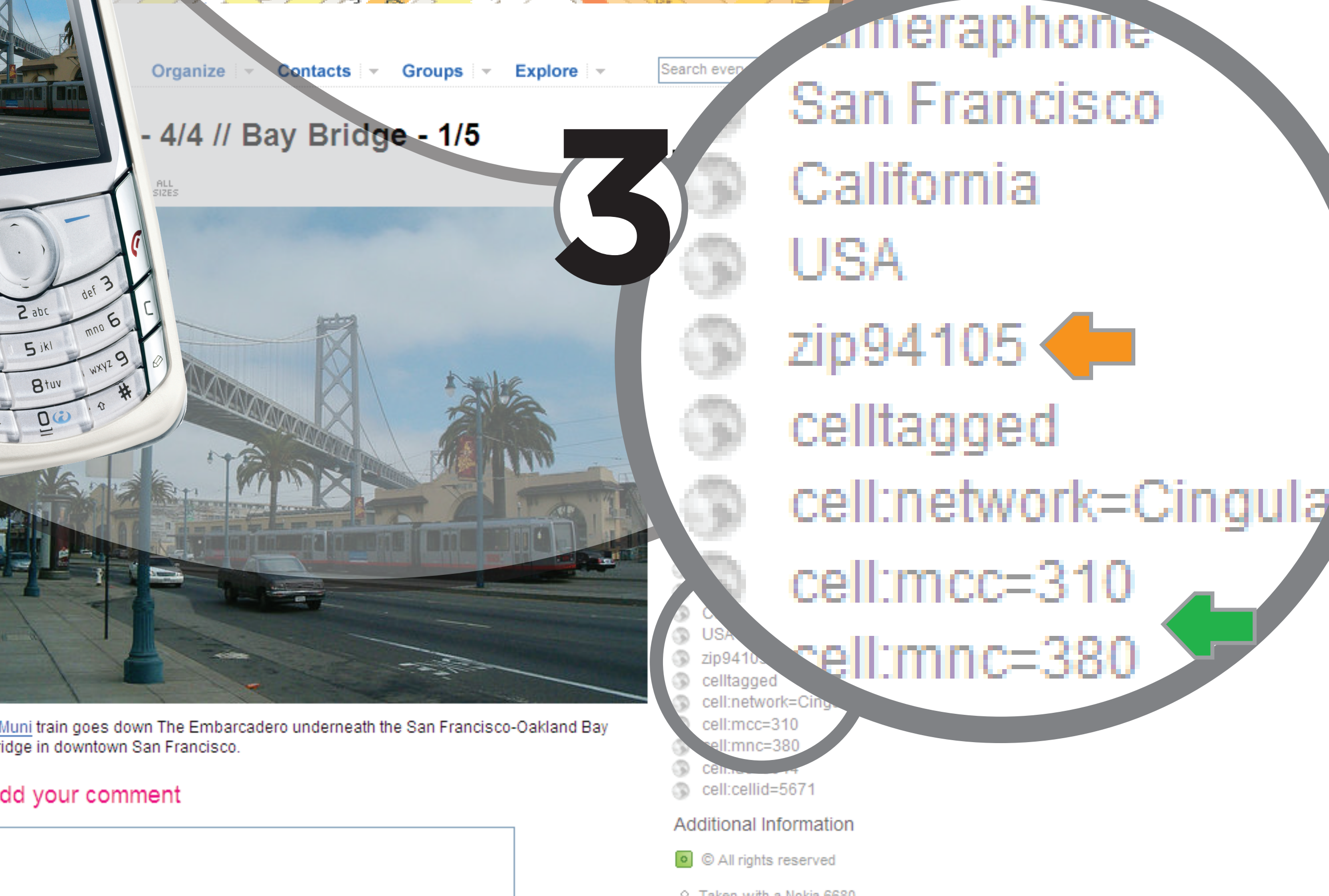
1



2



3



A Muni train goes down The Embarcadero underneath the San Francisco-Oakland Bay Bridge in downtown San Francisco.

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