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

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.

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.