# Demo: ThereNow - What is Happening Over There, Right Now?

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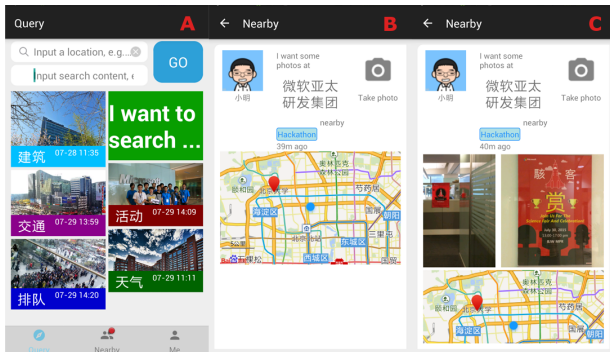
**Figure 1:** *ThereNow query scenarios. Left: Query categories. Center: User ties a question to a location on the map. Right: Replies start to come in for a given location and query topic.*

**Keywords:** Location-based Services, Crowdsourcing, Computer Vision, Web of Things.

**Concepts:** •**Human-centered computing** → **Ubiquitous and mobile computing systems and tools;** *Social tagging systems;* •**Information systems** → Image search;

## 1   Introduction

Imagine you need to know what is happening at a certain location. How could you achieve that? A search engine might be a choice, but the information may be outdated since the page was crawled. Radio and TV news can broadcast in real-time, but they focus only on hot events. Social networks can also be real-time, but how to request what you want and quickly spread your question?

We present ThereNow, a mobile app designed to get timely answers for questions about real world locations. Two key issues in this scenario are: extracting information from existing data to answer a user question; and easily acquiring more data or information, if it doesn't exist yet. Both as quickly as possible. This can be problematic due to the format and semantics of the data or due to the cost of collecting more data. ThereNow's design takes a unique approach where it relies on images as data and the user quickly 'seeing' if they provide the required information. This approach both bypasses the problems in information extraction and makes collecting more data as easy as just taking a photo. By implementing an efficient way to spatially broadcast queries and collect images we can leverage the ubiquity of mobile phones and the 'an image is worth a thousand words' effect, so users can easily and quickly get the information they need about what is happening now at a given location.

## 2   The System

ThereNow consists of an app to interact with content and a cloud backend that handles geo-spatial indexing of the data and users, and applying computer vision (CV) techniques to extract more information from images (and filter them).

There are three roles a user may play: *Requester*, *Helper*, and *Reviewer*. (1) Requesters are those that ask questions. A Requester submits a question with a certain location (required), question text (recommended), and tags (optional); (2) Helpers are those who upload photos (with optional descriptions/tags) in response to questions; and (3) During feedback time (when answers are back, but before the requester chooses one), Reviewers can 'like' or 'dislike' images to provide feedback which might help the Requester.

ThereNow only notifies nearby helpers of specific requests. Additionally, people using the app can tag themselves by interests. These tags can then be used as filters to prioritize who receives requests in an area with many users. However, sometimes there may be no users to answer a given query, causing feedback delay. For such situations, ThereNow uses two other data sources to fulfill requests. Firstly, the system utilizes cached photo replies (that came from other requests) - which have been marked with location, tags, and review counts (useful for filtering). And by applying CV techniques, even more features and categories can be extracted from them. Lastly, as a fallback system, online photos stream providers (such as microblogs, location review sites, or online maps) are crawled, whose photos also frequently have accurate location information and category information. All sources can also be mixed, with images sorted by a combination of criteria before being returned as query answers.

## 3   App Usage

Let's look at a scenario to exemplify the system work flow. When a person wants to know if the subway station is too crowded at this time, she can mark the station spot on the map and fire a new question. People around the station are then notified, and two people take photos inside the station. Now the user has a sense of the situation there and can decide whether to go the station now or later.

Fig. 1 shows some screenshots of the app - A) Question category selection; B) A user ties a question to a location in the map - which will trigger notifications to potential helpers; C) At last, the requester starts receiving potential answers. ThereNow caches all responses for potential intelligent reuse in new requests.

## 4   Conclusion

In this demo we show how a unique combination of images, crowdsourcing, and spatial data allows users to quickly get answers about real world locations in a flexible way.

## Acknowledgments