Introduction

- The growth of smartphone devices (6 billion in 2011) and their capabilities allow people to have ubiquitous access to the Internet.
- Each device can be used as a multi-modal sensor to collect different kinds of data, e.g., video, picture, location, time, direction, acceleration.
- Efficient and scalable data collection through spatial crowdsourcing.

Problem Definition

- Motivation
  - Spatial crowdsourcing is emerging as new platform to the research community.
  - Smartphone devices + spatial crowdsourcing: an efficient way to collect data.

- Scenario
  - 3 workers with spatial (region R), temporal (time-limit TL) and other constraints (Max Tasks).
  - 6 tasks with specific location, expiry date, max hits and perform time.
- Goal: Maximize the number of assigned tasks while satisfying the workers’ constraints.

System Architecture

- Web and Mobile User Interfaces
- Standard three-tiers application (Client, App Server, DB Server)
- Multi-layered App server architecture

Task Publishing

- Google Maps JavaScript API that provides a multi-functional map-based interface.
- Requesters can select accurate task location.
- Task details include Title, Description, Location, Expiry Date, Max Hits and media type.
- Tasks are stored in MySQL DB with spatial extensions for further processing.

Task Inquiries

- Smartphone-based UI.
- Workers set their working requirements: region, max # of tasks.

Intelligent Task Assignment

- Goal: Maximize the task assignments.
- Challenge: Satisfying the workers’ constraints.

Data Collection

- Data + Metadata are collected and uploaded.
- Status of a task is reported to requesters.

Related Research

- Crowdsourcing emerged in research communities and industry (Amazon Mechanical Turk, CrowdFlower etc).
- Participatory sensing is related to spatial crowdsourcing: collect traffic data, trajectories etc.
- Mobile geo-social technologies/applications

Conclusion and Future Work

- Add different worker’s constraints, such as Time-Limit. A set of tasks cannot be assigned to workers if they require travel time plus perform time exceed the time limit.
- Integration with multiple mobile platforms.
- Commercialization