Introduction

- Motivations:
  - Limited storage on the mobile devices for large-scale media content;
  - Difficult for big media data search. E.g., Dropbox, Google Drive, iCloud;
  - Rich video queries are demanding, e.g., “Find images of myself captured in front of Tommy Trojan during the 2013 USC-UCLA football game day.”

- MediaQ is a novel online media management system to collect, organize, share, and search mobile multimedia contents using automatically geo-tagged metadata.

New features of the system
1. W4-metadata per video frame:
   - When, capture time;
   - Where, region covered by the video frame;
   - What, keywords auto-tagged with the video frame;
   - Who, people shown in the video frame.
3. Flexible video search based on the W4-metadata.

Video Frame Model

- Model a video frame \( f \) with W4-metadata in form of \((p, \theta, R, a, t, k, f)\):
  - \( p \): camera location
  - \( \theta \): view direction (w.r.t. north)
  - \( R \): maximum viewable distance
  - \( a \): viewable angle
  - \( t \): timestamp
  - \( k \): a set of keywords tagged with \( f \)
  - \( f \): people shown in \( f \).

System Architecture

- Geo-Crowd Sourcing Module
  - Web App (Tasks creation);
  - Server Side (Maximum Task Assignment [1]);
  - Mobile Side (Task execution)

Query Processing

- Region queries
  - Find FOVs whose camera locations are in the visible area on the map interface
- Range queries
  - Find FOVs overlap with a given query circle
- Directional queries
  - Find FOVs whose directions are within a given query direction angle
- Keyword queries
  - Find FOVs that contain the query keywords
- Temporal queries
  - Find FOVs that during a given time interval
- Presenting query results
  - To combine FOV results into video segments

Experimental Results

- NATO Summit 2012 Coverage
  - NATO Summit event that was held in Chicago in May 2012
  - >20 students participated
  - 250 videos were recorded, uploaded and searched in real time
- PBS Inaugblog 2013
  - The Presidential Inauguration in Washington DC in January 2013
  - >15 students participated
  - ~20 panorama generated from the video collected based on the geo-information [3]

Related Work


Conclusion and Future Work

- MediaQ provided preceedented capabilities of organizing and searching media contents with W4-metadata.
- Our future direction is to extend to manage indoor videos without GPS signals.