CS587 Course Projects

Presented by Yaguang Li

Sep 7th, 2016
Schedule

- Sep 11\textsuperscript{st}: Find teammates, fill this \textbf{form}.
  - Team size: 2 - 3.
- Sep 18\textsuperscript{th}: Decide project topics, fill this \textbf{form} and submit project proposal in Blackboard (\textbf{template} and \textbf{sample}).
- Oct 16\textsuperscript{th}: Submit midterm report in Blackboard (\textbf{sample}).
- Dec 2\textsuperscript{nd}: Submit \textbf{deliverables} in Blackboard.
Deliverables

• Source code.
  - For both client and server to reproduce the results/verify the claims.

• Tech report.
  - Describe the project including architecture, functionality, deployment, GUI, etc.

• Presentation slides

• Demo video (optional).
Grading

● Project Proposal, Midterm/Final Report (15%)
● Functional prototype (40%)
● Graphical User Interface (15%)
● Creativity (20%)
  - Novel ideas, appealing features
● Demo & Presentation (10%)
Global Internet Device Sales

Sources: Gartner, IDC, Strategy Analytics, Machina research, company filings, BII estimates
Platforms

- Mobile phone
  - iOS
  - Android

- New devices
  - Watch, Fitbit
  - Glass, VR/AR devices
  - IoT related, e.g., Google Beacon
Grading

- Project Proposal, Midterm/Final Report (15%)
- Functional prototype (40%)
- Graphical User Interface (15%)
- Creativity (20%)
  - Novel ideas, appealing features
- Demo & Presentation (10%)
- 10% extra credit for projects on NEW devices.
Example Topics
iCampusProfiler

• Mobile phones as moving sensors to collect information around campus.

• Example 1: collect location related information on/around campus (e.g., food like Yelp).
  – Recommend good meals of the day
  – Free food information
  – Special meals/drinks in the restaurants near campus
iCampusFood
AroundMe

Real-time location based social advertising platform
Spatial Crowdsourcing
Spatial Crowdsourcing

Crowdsourcing: outsourcing a set of tasks to a set of workers. Amazon Mechanical Turk

Spatial crowdsourcing (SC): requires workers to physically travel at the task's location in order to execute the task.

Ubiquity of mobile users: 6.5 billion mobile subscriptions, 93.5% of the world population [1]

Technology advances on mobiles: Smartphone's sensors, e.g., video cameras

Network bandwidth improvements: From 2.5G (up to 384Kbps) to 3G (up to 14.7Mbps) and recently 4G (up to 100 Mbps)

Crowdsourced Pokemon Go Map

* Screenshot from https://www.pokecrew.com/
MediaQ
Multimedia Mobile Management System

• Media management system to **collect**, **organize**, **share**, and **search** mobile videos using geo-tagged metadata

• Rich video metadata
  – **Where** and **When** metadata
  – **Who** metadata, e.g., people counting
  – **What** metadata, e.g., keyword tagging [2]

https://www.youtube.com/watch?v=JIejkI1rsOo
MediaQ Services

MediaQ API
An API to access MediaQ data
Created by MediaQ Team
See more at http://local.eclipse.org
Contact the developer

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<th>geocrowd: Geocrowd Operations</th>
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<td>GET /geoq/sample_videos</td>
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http://mediaq.usc.edu/MediaQ_MVC_V3/docs/api/
MediaQ APIs

Python
https://github.com/ubriela/mediaq-clipy

JavaScript
https://github.com/ubriela/mediaq-js
GeoCrowdSensing
GeoCrowdSensing

Crowdsourcing weather information (e.g., rain, air pollution, light intensity, temperature, noise level)
GeoCrowdSensing - Functions

• Requesters submit a task, e.g., a location
• Workers within a distance (e.g., 5 miles) from the task can view the task and response (e.g., light/medium/heavy rain)
• Map-based GUI for posting tasks and reporting weather

iRain
http://irain.eng.uci.edu/
QExplorer
Augmented Reality
GeoFence
GeoFence

• GeoFences are critical areas defined by either a mobile user or by a security officer
• GeoFence information is stored in the database on Server
• Mobile clients received GeoFence alerts once their location are relevant to some GeoFences
PalHunter
PalHunter

• Mobile client record its location changes (moving trajectory)
• Server monitors the moving trajectories of all clients
• Clients can query trajectories of others
  – Time dependent range query (e.g. show me all the users within 20 meters)
  – User trajectory query (e.g. show me the trajectory of one user in the past 2 hours)
PalHunter-Client

- View the trajectory of yourself on mobile phone
- Send location updates to server in real-time
- Clients receive location updates when friends move close by (within some predefined range)
- Client can issue queries on the server
- Integrate with Facebook
PalHunter-Server

• Server receives location updates from users
• Server renders users’ moving trajectories on a Map view (real-time)
• Server supports queries from mobile client
  – E.g. show me all the users within 20 meters range
  – show me the trajectory of one user in the past 2 hours
Getting started

• Tutorial
  – Android
    • https://developer.android.com/training/index.html
  – iOS

• Setup Cloud Server
  - Sign up for AWS Educate for $100 credit.
  - Tutorial:
    http://cs-server.usc.edu:45678/hw/hw7/HW7_AWS.pdf
Useful links

• Icons: http://www.flaticon.com/

• Source Control: https://bitbucket.org/, https://github.com/

• Cloud Service:
  - https://aws.amazon.com/ec2/?nc2=h_l3_c
  - https://cloud.google.com/
Q & A
GeoCrowdPricing

Contact
Hien To hto@usc.edu
GeoCrowdPricing (Research)

• How reward correlates with various costs in order to incentivize people to accept a spatial task?
ScenicPath

Contact
Ying Lu ylu720@usc.edu
ScenicPath (Research)
Find the most scenic path on a road network