

# Mobile App Development Workshop

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<http://facebook.com/LIUMobileGIS>  
<http://liu.edu/gis>

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# Agenda

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## Presentation

1. Introduction
  2. Overview of App Development
  3. Installation Process
  4. Q&A
- (break)

## Lab

BYOD: Android Workshop - Hello Map!

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# About Me

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Computer + Earth Science

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# In University

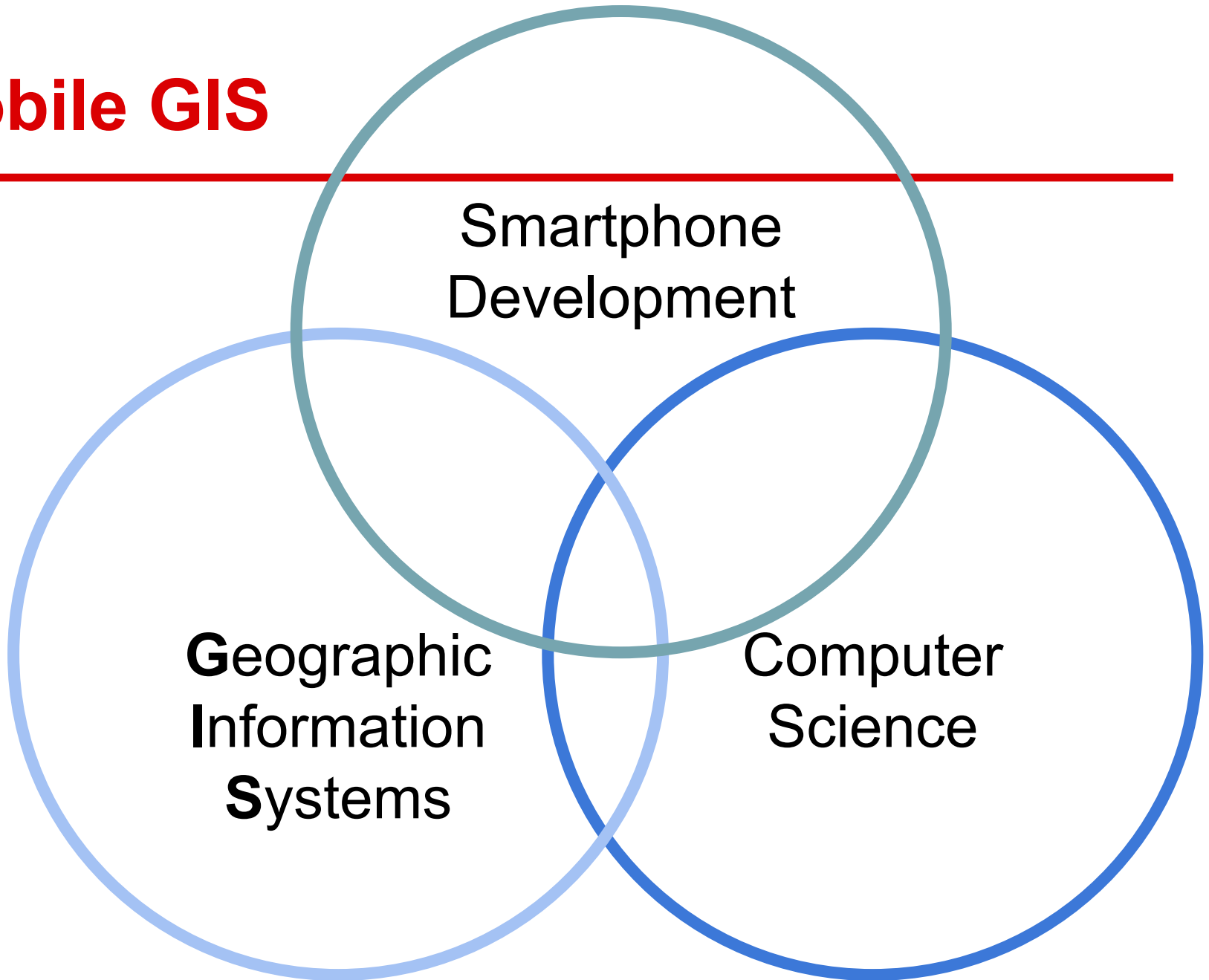
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- Full Time .NET Developer
  - Distributed 15,000+ iPads with Apps
  - Launched Online Campus: "Mobile GIS"
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# Mobile GIS

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Smartphone  
Development

**G**eographic  
Information  
**S**ystems

Computer  
Science

# Mobile GIS

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## Requirements

501: Introduction to GIS

502: Introduction to  
Computer Science

## Electives (Pick Two)

503: iOS

504: Android

503: Web App

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# In My Company

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- CTO
  - Developing Apps since day 1 of App Store
  - More than 180+ apps: iOS, Android, and  
Windows Phone
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# Why Mobile?

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# Sensors

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- How many sensors?
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# Sensors

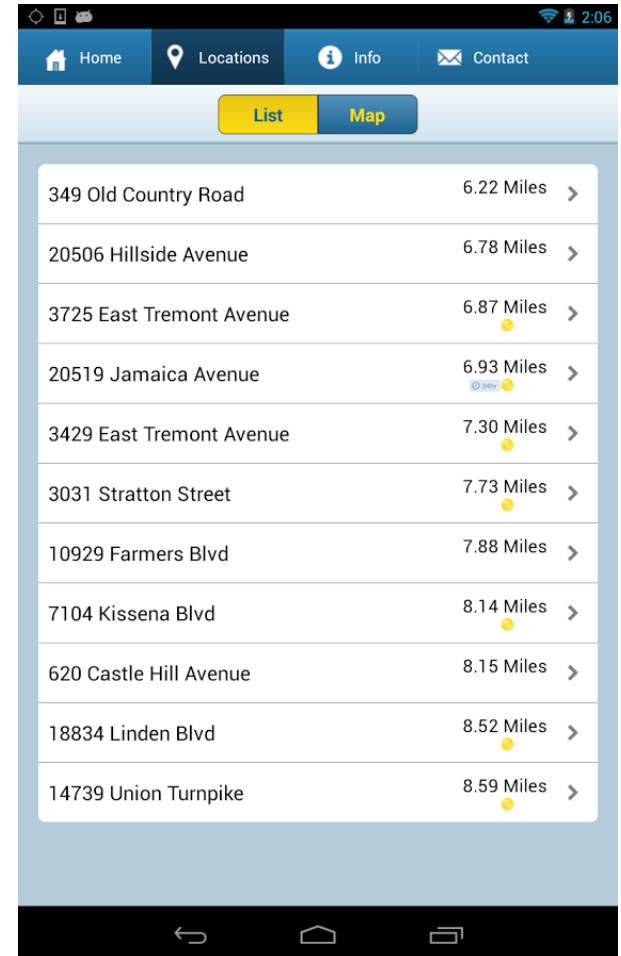
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- GPS: Lat / Lng
  - Magnetometer
  - Accelerometer: Tilt - X,Y,Z
  - Gyroscope : Pitch, Yaw and Roll
  - Proximity Sensor
  - Camera
  - Microphone
  - Barometer
  - Bluetooth (e.g. iBeacon) etc...
-

# Store Locator

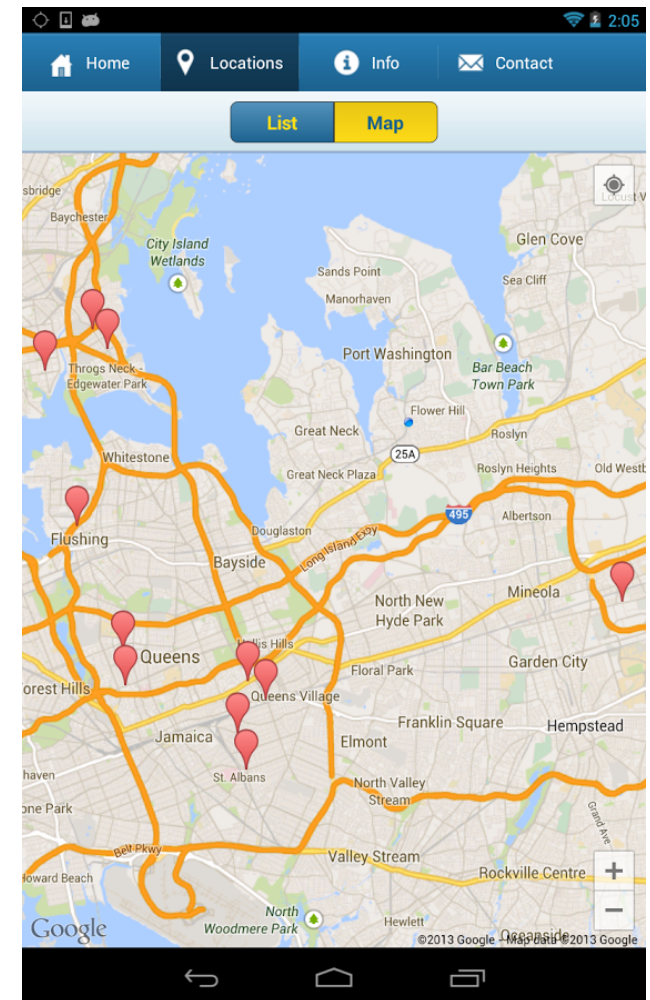
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- Typical Store Locator
- Distance Search
- Direction
- Multi-Platform:  
iOS/Android  
Phone/Tablet



# Store Locator

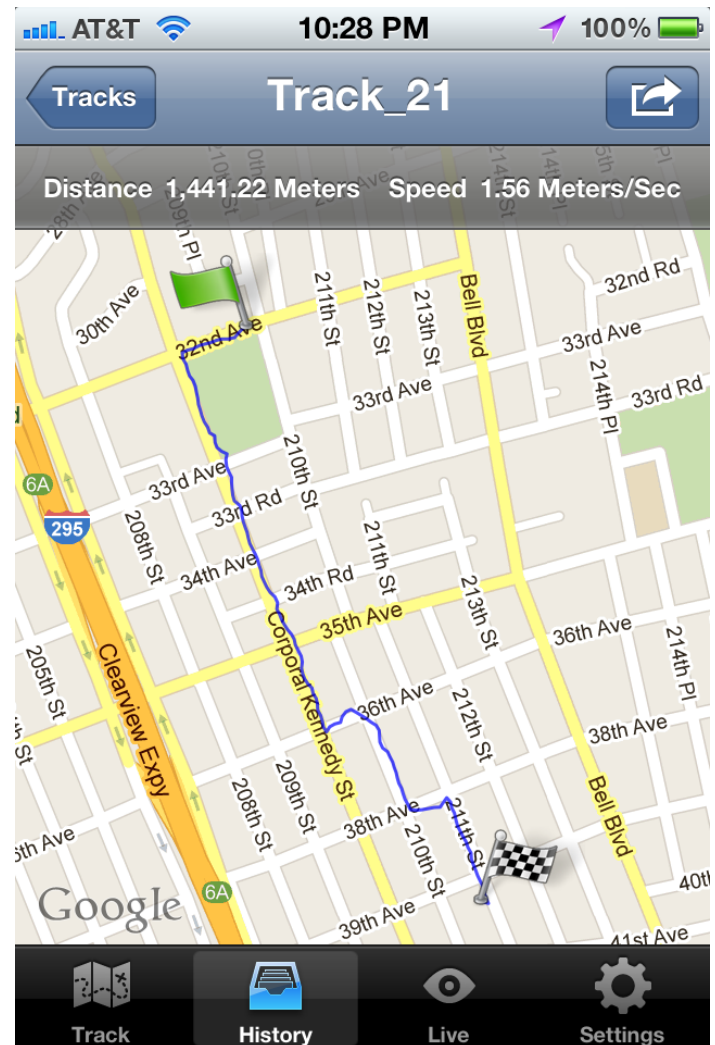
- Typical Store Locator
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- Multi-Platform:  
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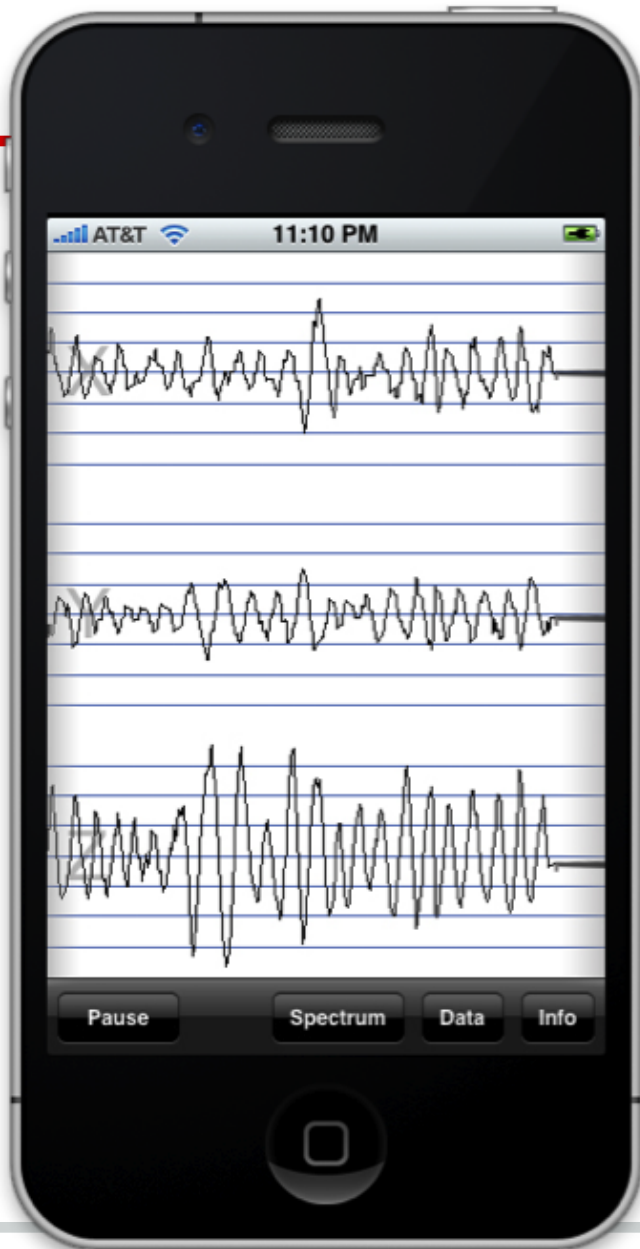


# Tracker

- Draw Polyline
- Calculate Geographic Distance
- Calculate Speed



# iSeismometer



# User Experience

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- Multi-Touch Screen
  - Portability
  - Simplicity
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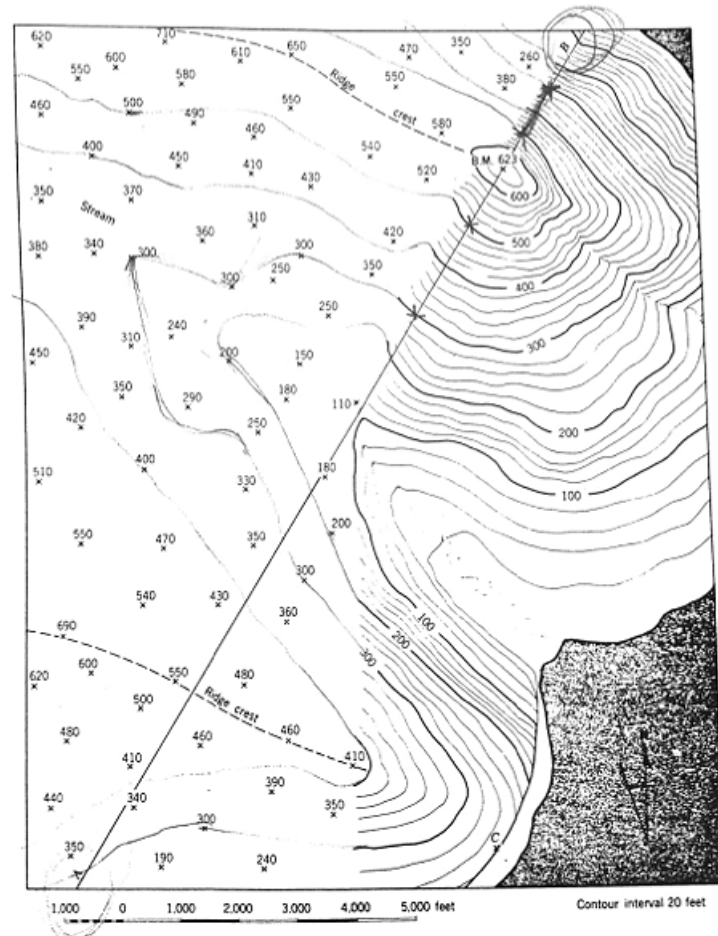
# Measure Apps



Tap to draw polygon & calculate the area or distance

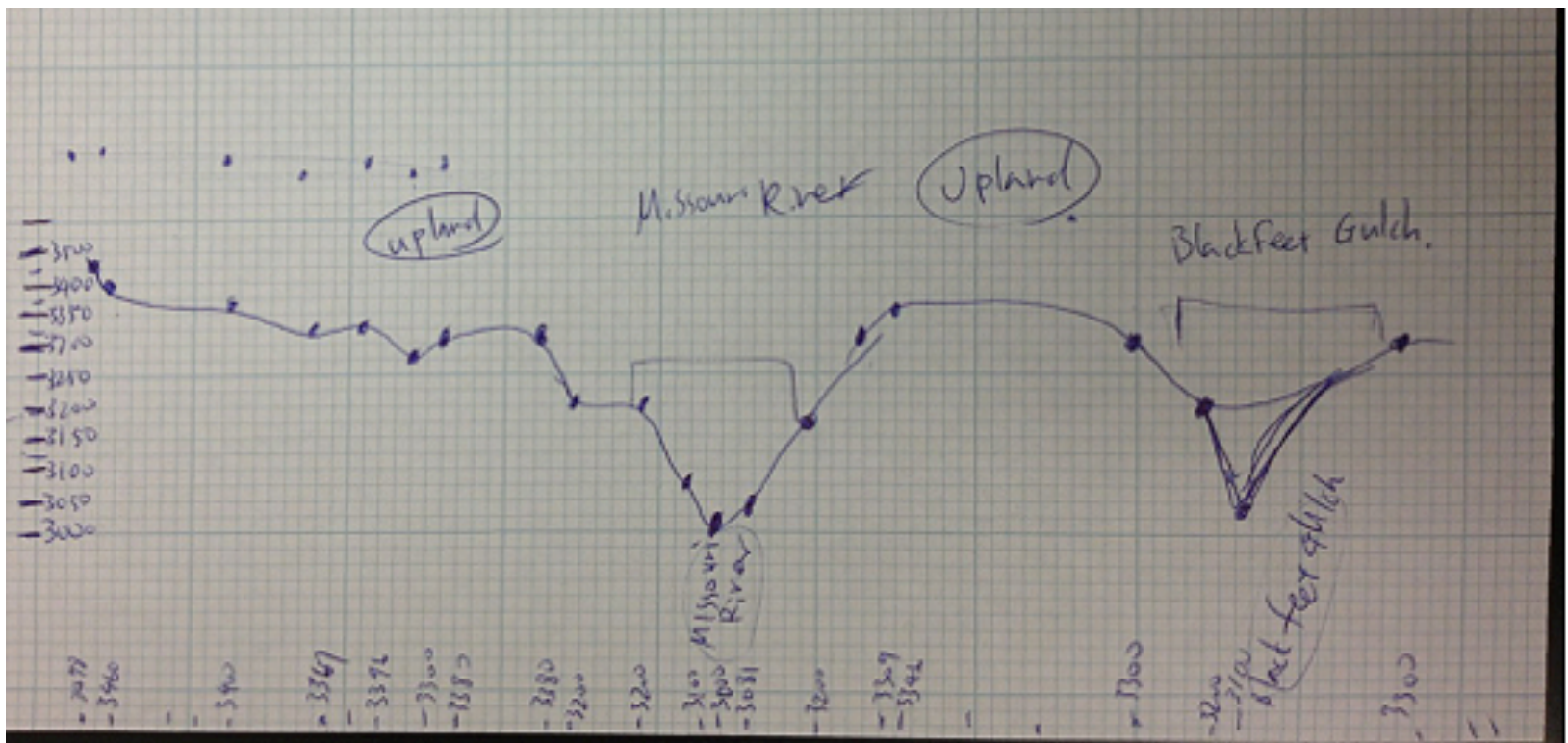
# Elevation - In classroom

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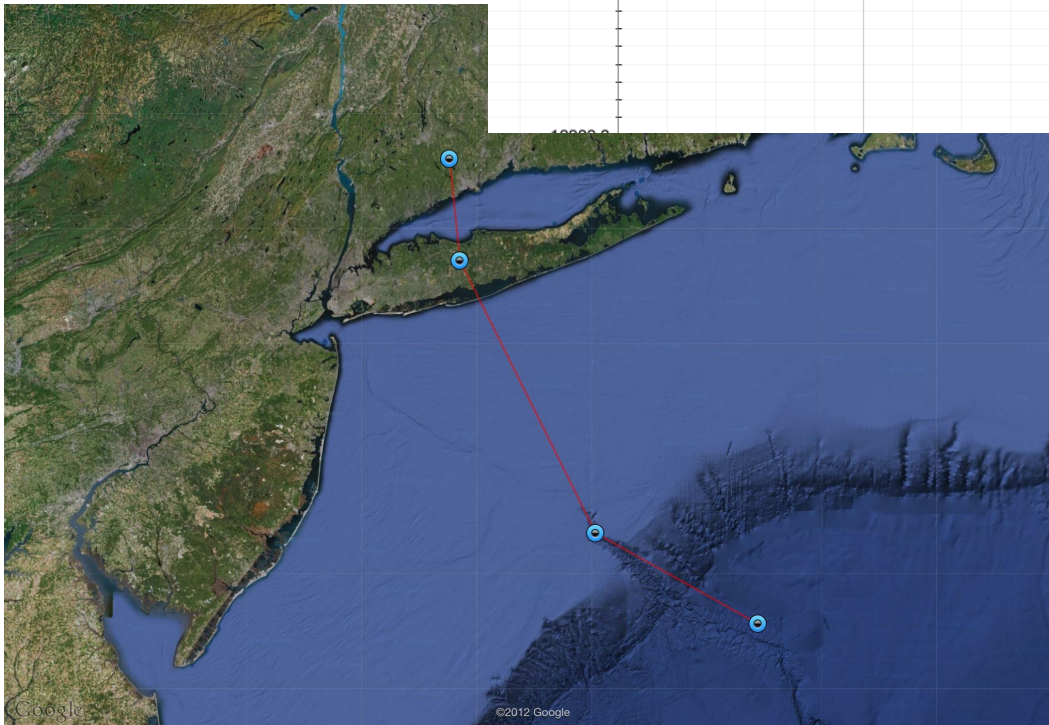
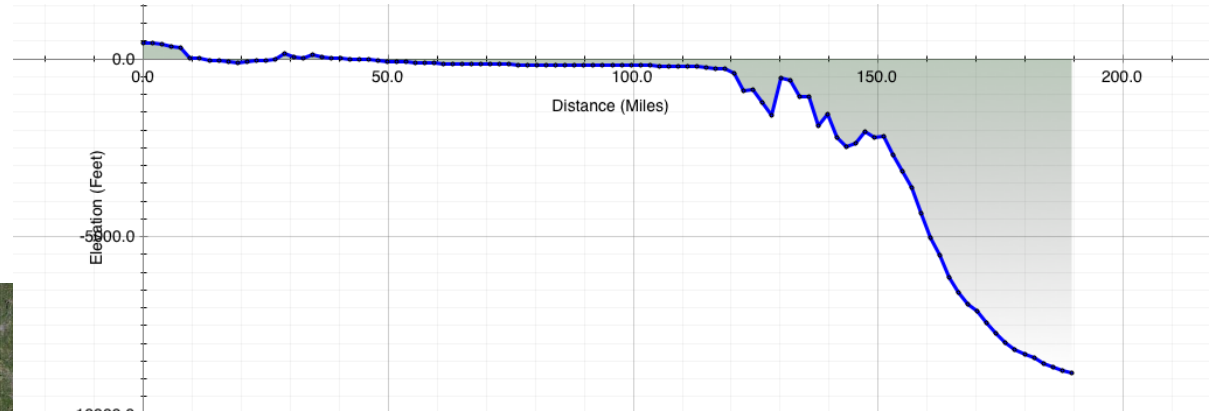


# Elevation - In classroom



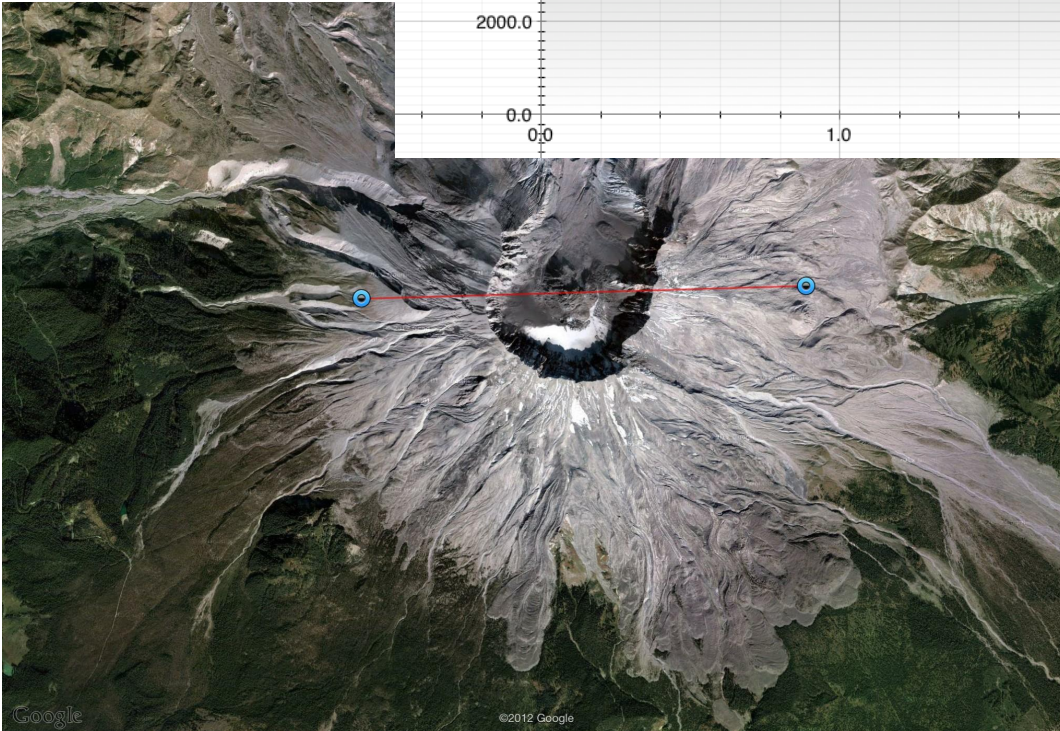
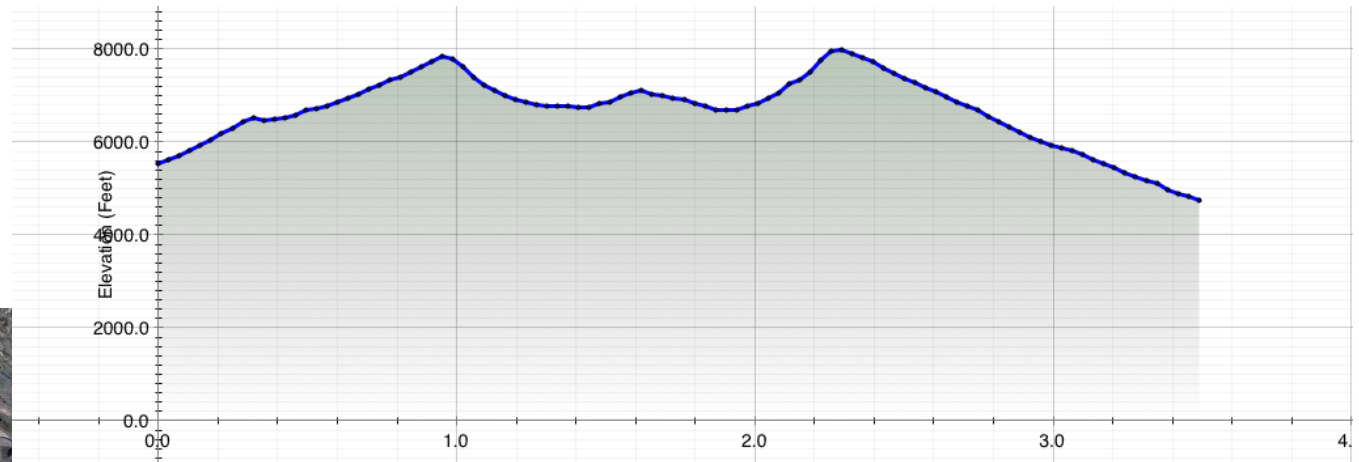
# Elevation App - Android & iOS

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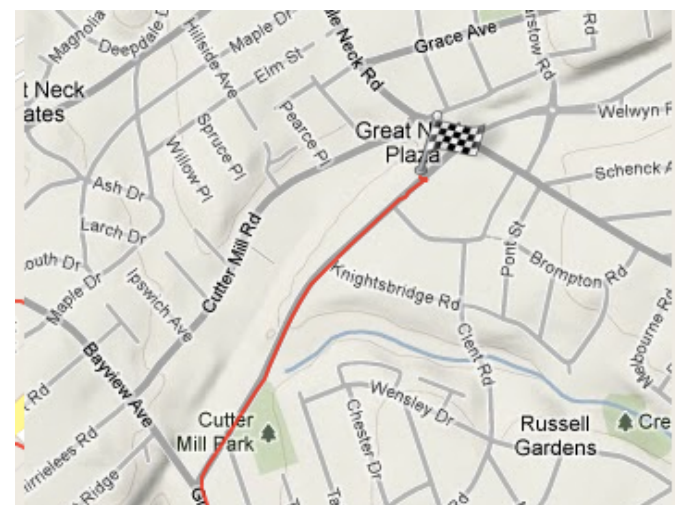
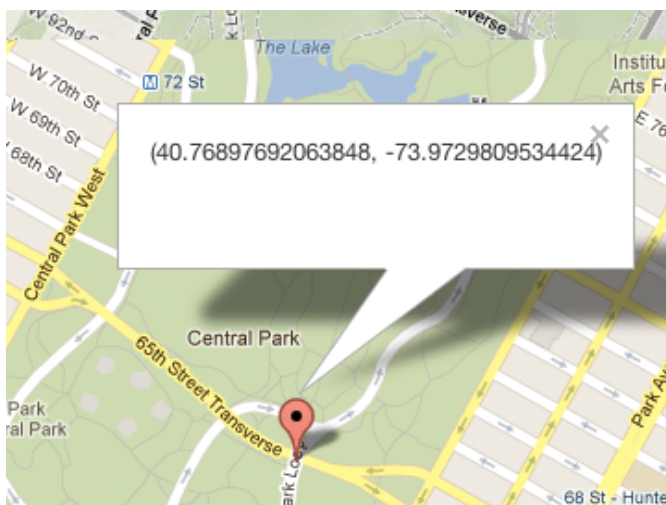
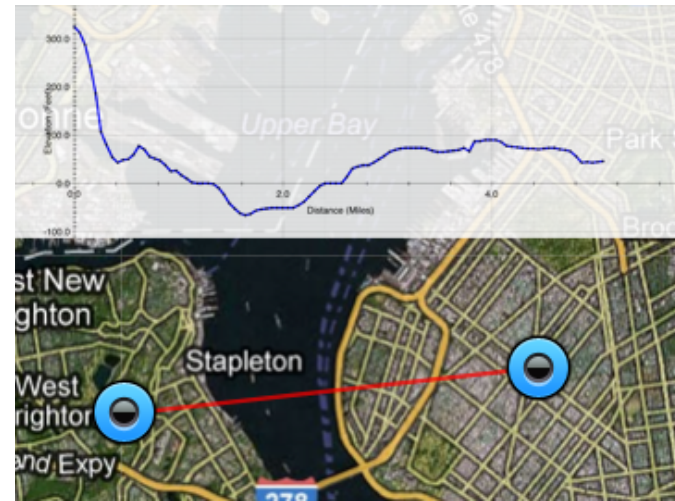
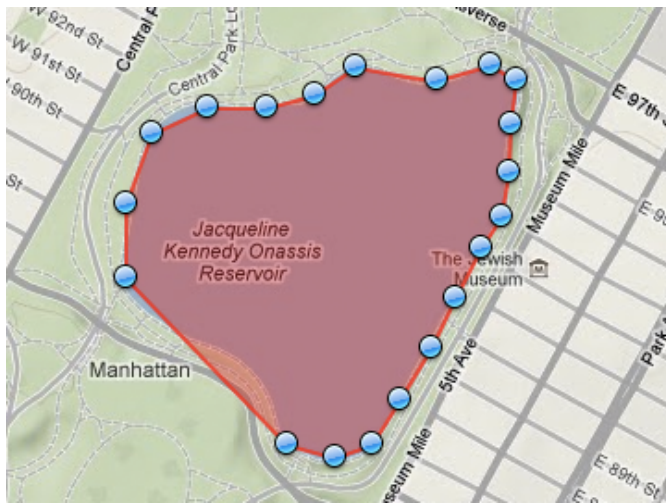
# Elevation - Mount St. Helens

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# Web Apps



# Scope of Apps

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- What is the role of mobile device?
- Data Collection? Portable Viewer? As a part of software suite?

... but try to avoid "Everything in one app"

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# Wifi Mapper - iOS Version

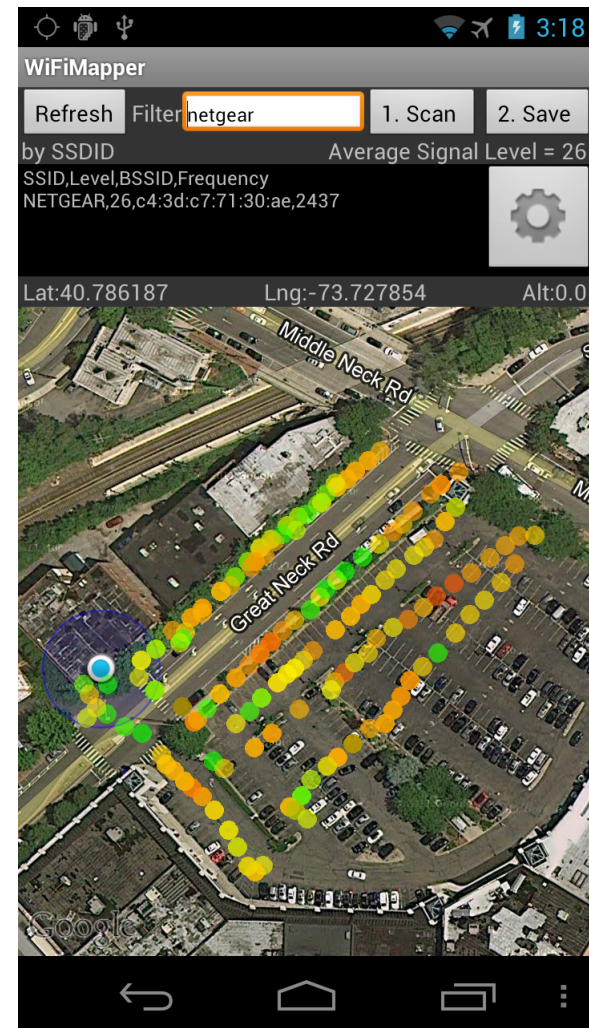
- Data Recording App
- Record Wifi strength and GPS coordinates
- Export data as Excel format
- Display recorded locations as markers



# Wifi Mapper - Android Version

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- Data Recording App
- Record Wifi strength and GPS coordinates
- Export data as Excel format
- Display recorded locations as markers

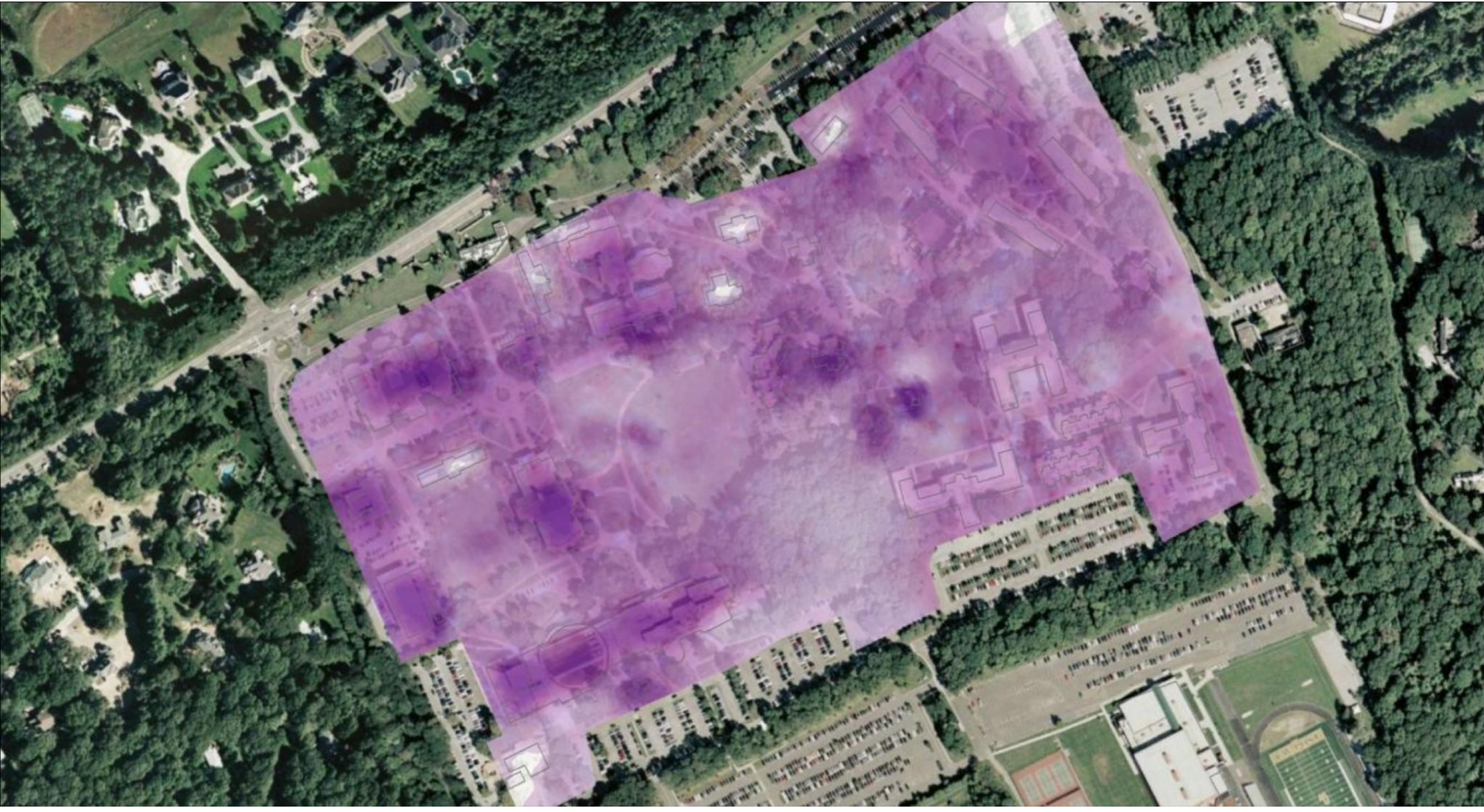




# Wifi Mapper - Desktop to Web App

[gis.liu.edu](http://gis.liu.edu)

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# Other GIS Apps

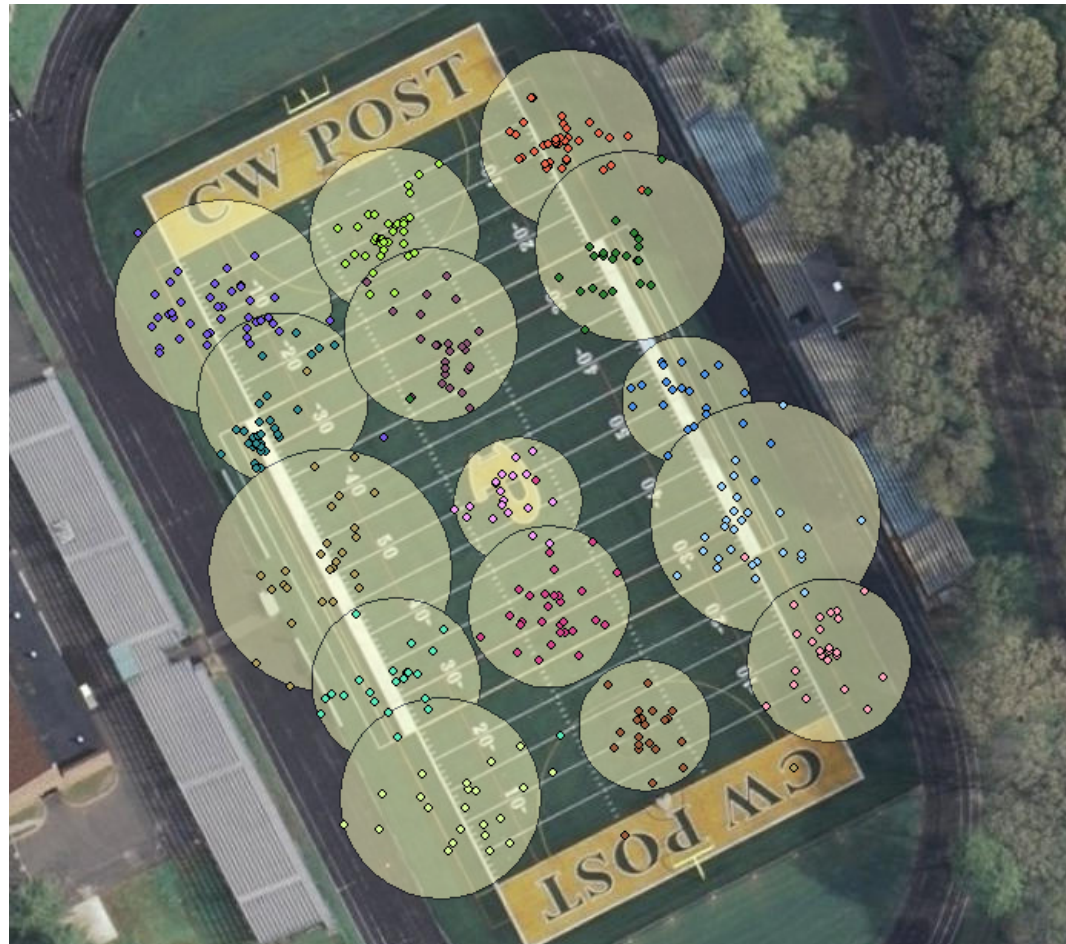
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- Mailbox Finder / Fleet
  - Store Locator
  - Campus Map
  - WiFi Mapper
  - Geo Measure
  - Tracking Apps
  - Shoreline AR App
  - Checkin Apps
  - Shapefile Loader
  - Data Collection Apps, etc...
-



# About Accuracy and Precision

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# Consideration

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- Maintainability
  - Accuracy of Data
  - Battery Life
  - Compliance / Liability
  - Variety of Usecases
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# **iOS v.s Android**

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# Development Environment

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	iOS	Android
OS	MacOS Only	Windows & MacOS
SDK	XCode	JDK
IDE		ADT
Plugin		Eclipse, IntelliJ, and Android Studio
Language		Google Play Services
Regular Test	Objective-C	Java
Map SDK	Simulator	<u>Emulator</u>
Map App	Apple, Google, ArcGIS, etc...	Google, ArcGIS, etc...
Map App Test	Simulator and Device	<u>Device Only(?)</u>
	Easy on Simulator	<u>Difficult (e.g. Use 3rd Party App)</u>

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# Suggestion #1

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"Buy a device for Android  
Development"

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# Why Device?

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- Faster
  - Only \$200
  - Map App does not work on Emulator
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## Suggestion #2

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"If you have a choice to buy Mac or Windows, buy a Macbook."

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## In Short...

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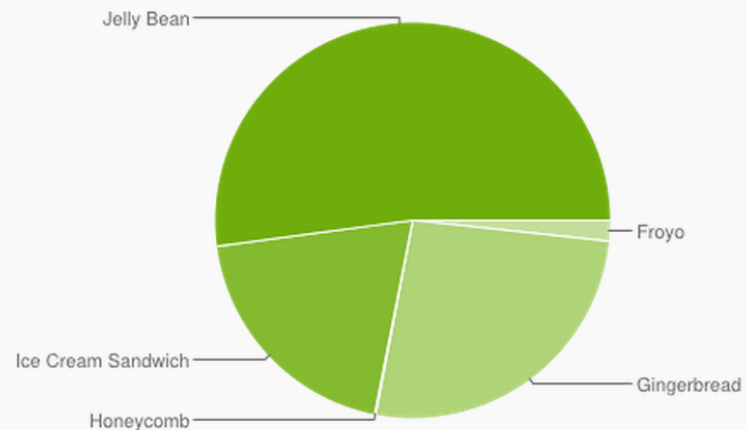
"You need only Mac for iOS  
but you need a device for  
Android. "

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# Distribution

	iOS	Android
Test Distribution	AdHoc Provision	Just Send .APK
Demo	AirServer	Android Screencast
Store	Review (7 - 10 days)	No Review
Compatibility	Only Few Variations Fast Update	Diverse Slow Update

Version	Codename	API	Distribution
2.2	Froyo	8	1.7%
2.3.3 - 2.3.7	Gingerbread	10	26.3%
3.2	Honeycomb	13	0.1%
4.0.3 - 4.0.4	Ice Cream Sandwich	15	19.8%
4.1.x	Jelly Bean	16	37.3%
4.2.x		17	12.5%
4.3		18	2.3%



# Suggestion #3

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"Android Development is easier, faster, and cheaper because of Java and Open Source?  
There is a catch"

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# iOS Setup for Map App

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1. Buy a Mac
2. Download XCode from App Store
3. Done!



# Android Setup for Map App

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1. Setup Environment:
    - a. Eclipse + ADT + JDK
    - b. IntelliJ + ADT + JDK
    - c. Android Studio + JDK
  2. Device Driver
  3. Plugin: Google Play Service
  4. Generate Hash on the device
  5. Create Generate Key at Google API Console
  6. Configure the App
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**Web App**

**v.s**

**Native App**

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# Web Apps v.s. Native Apps

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	<b>Web</b>	<b>Native</b>
Rendering	Browser Rendering	OpenGL
Language	HTML5 & JavaScript	Objective-C, Java, etc...
Usability	B+	A
Flexibility	A	B
Development Cost	A	C
Capability	B- (getting better!)	A

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# Data Format

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Format	Rating
CSV	Easy and there are a lot of libraries, but limited features
GeoJSON	Easy and take advantage JSON Library
KML	Midium and take advantage existing xml library
ShapFile	Difficult, Slow and Limited Access to Libraries
ESRI Web Service	Easy and use API from ESRI

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# ShapeFile & ArcGIS Web Services

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- OpenMap Library for ShapeFile
  - ESRI ArcGIS SDK for Web Services
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# Testing

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# TestFlight is your buddy

**TestFlight** Dashboard Apps People Support ObjectGraph LLC

ObjectGraph LLC Apps GeoMarker

We are updating our storage services  
Some builds uploaded between 11/7 13:09 PST - 11/8 13:00 PST may be unavailable until full resolution.  
[Read More](#)

## Builds

All of the beta builds for this app you have uploaded

Builds	Added Date	Built For	SDK	dSYM	Crashes	Feedback	Installs
1.0 (1.0) #4	Oct. 31, 2013	Universal	✓ 2.0.2	✓	0	1	4
1.0 (1.0) #3	Oct. 31, 2013	Universal	✗	✗	0	0	1
1.0 (1.0) #2	Oct. 18, 2013	Universal	✗	✗	0	0	2
1.0 (1.0)	Oct. 18, 2013	Universal	✗	✗	0	0	3

**Settings**

- App Information
- App Token
- SDK Debugger

**Reports**

- Builds**
- Production Crashes



# Why TestFlight?

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- Automate Test Binary Distribution
- Measurement: Sessions, Crash Report,
- Management: Issue Tracker, Bug Reporter, Check-Point etc...

Get a free account today [testflightapp.com](https://testflightapp.com)

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# Thank you Lab Session

<http://bit.ly/geocon2013>

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[kiichi@liu.edu](mailto:kiichi@liu.edu)

<http://www.liu.edu/gis>

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