Introduction to MapKit

Christopher M. Judd

Judd Solutions

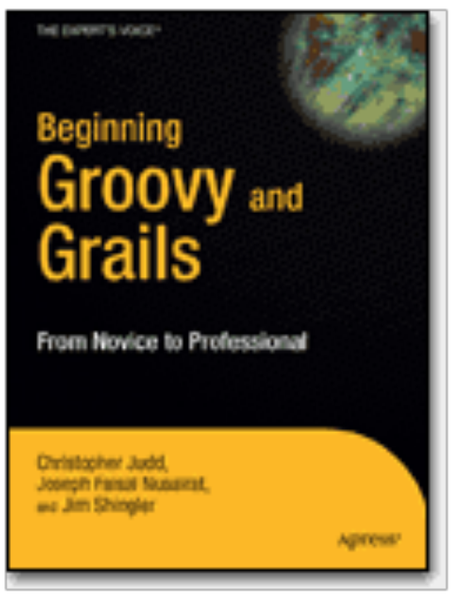
Christopher M. Judd

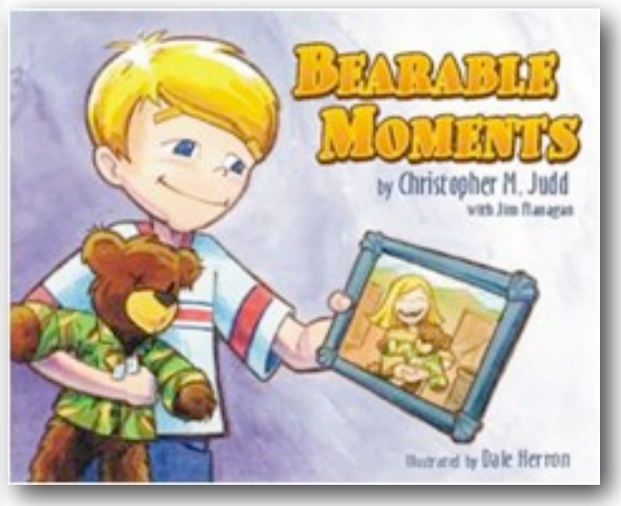
President/Consultant of **Judd Solutions**

leader

Columbus 

Developer User Group (CIDUG)






More
THE TABERNACLE
Carrier
9:32 PM
Remarkable
Ohio
OHIO HISTORY
Ohio | eTech Ohio
OHIO HISTORICAL SOCIETY
OHIO HISTORICAL MARKER
SITE OF OHIO'S FIRST STATEHOUSE
Carrier
12:20 PM
GERMAN VILLAGE SOCIETY
Welcome to historic German Village!
Shop
Dine
Stroll
Stay
Events
Donate
Carrier
2:21 PM
imSafe™
mobile security worldwide
Carrier
9:33 PM
University System of Ohio
our guide to Ohio's
ic colleges, universities
nd adult education
programs

Columbus History Map Source

github SOCIAL CODING

cjudd 2 | Dashboard | Inbox 0 | Account Settings | Log Out

Explore GitHub | Gist | Blog | Help | Search...

cjudd / ColumbusHistoryMap_iOS

Admin | Unwatch | Pull Request | 2 | 2

Source | Commits | Network | Pull Requests (0) | Fork Queue | Issues (0) | Wiki (0) | Graphs | Branch: master

Switch Branches (1) | Switch Tags (0) | Branch List

Example iOS application using MapKit — Read more

click here to add a homepage

Downloads

SSH | HTTP | Git Read-Only | git@github.com:cjudd/ColumbusHistoryMap_iOS.git | This URL has **Read+Write** access

Removed specific user setting folder.

cjudd (author)
about 22 hours ago

commit b042c5ad91f8497a0dfa
tree a8c7ff36a0aa7a6d76e8
parent a18ea8ac8e032bf21fb9

ColumbusHistoryMap_iOS /

name	age	message	history
Classes/	about 22 hours ago	Added orginal ColumbusHistoryMap code. [cjudd]	
ColumbusHistoryMap.xcodeproj/	about 22 hours ago	Removed specific user setting folder. [cjudd]	
ColumbusHistoryMap-Info.plist	about 22 hours ago	Added orginal ColumbusHistoryMap code. [cjudd]	
ColumbusHistoryMapViewController.xib	about 22 hours ago	Added orginal ColumbusHistoryMap code. [cjudd]	
ColumbusHistoryMap_Prefix.pch	about 22 hours ago	Added orginal ColumbusHistoryMap code. [cjudd]	
MainWindow.xib	about 22 hours ago	Added orginal ColumbusHistoryMap code. [cjudd]	
README	about 23 hours ago	initial commit [cjudd]	
history.png	about 22 hours ago	Added orginal ColumbusHistoryMap code. [cjudd]	
libisimulate.a	about 22 hours ago	Added orginal ColumbusHistoryMap code. [cjudd]	
main.m	about 22 hours ago	Added orginal ColumbusHistoryMap code. [cjudd]	

https://github.com/cjudd/ColumbusHistoryMap_iOS

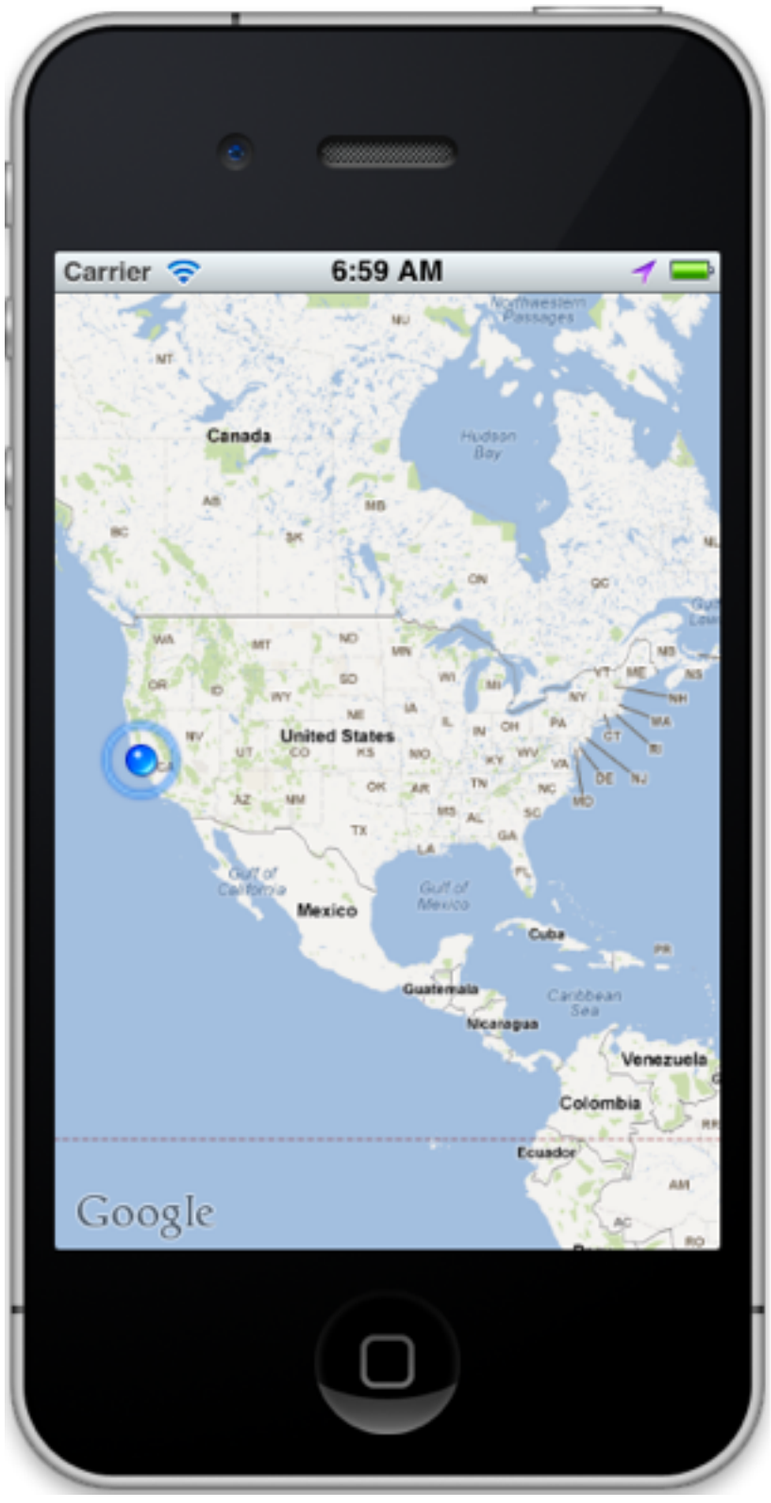
MapKit Basics

MapKit

MKMapView

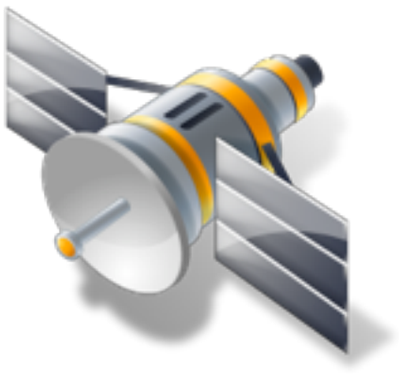
Google maps

Current Location



1 kilometer

100 meters



10 meters

Core Location Framework

Map Types

Standard

Satellite

Hybrid

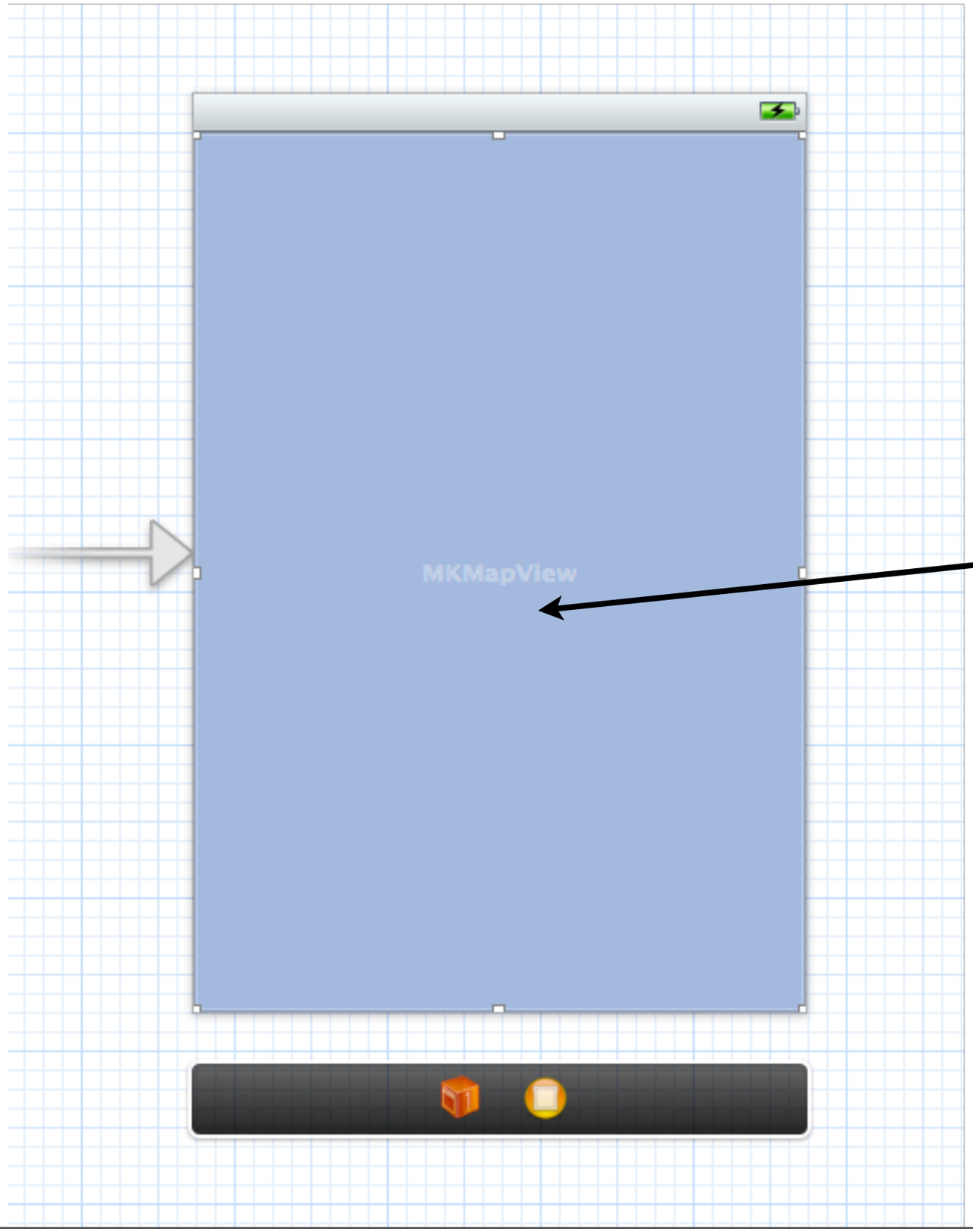
Annotations

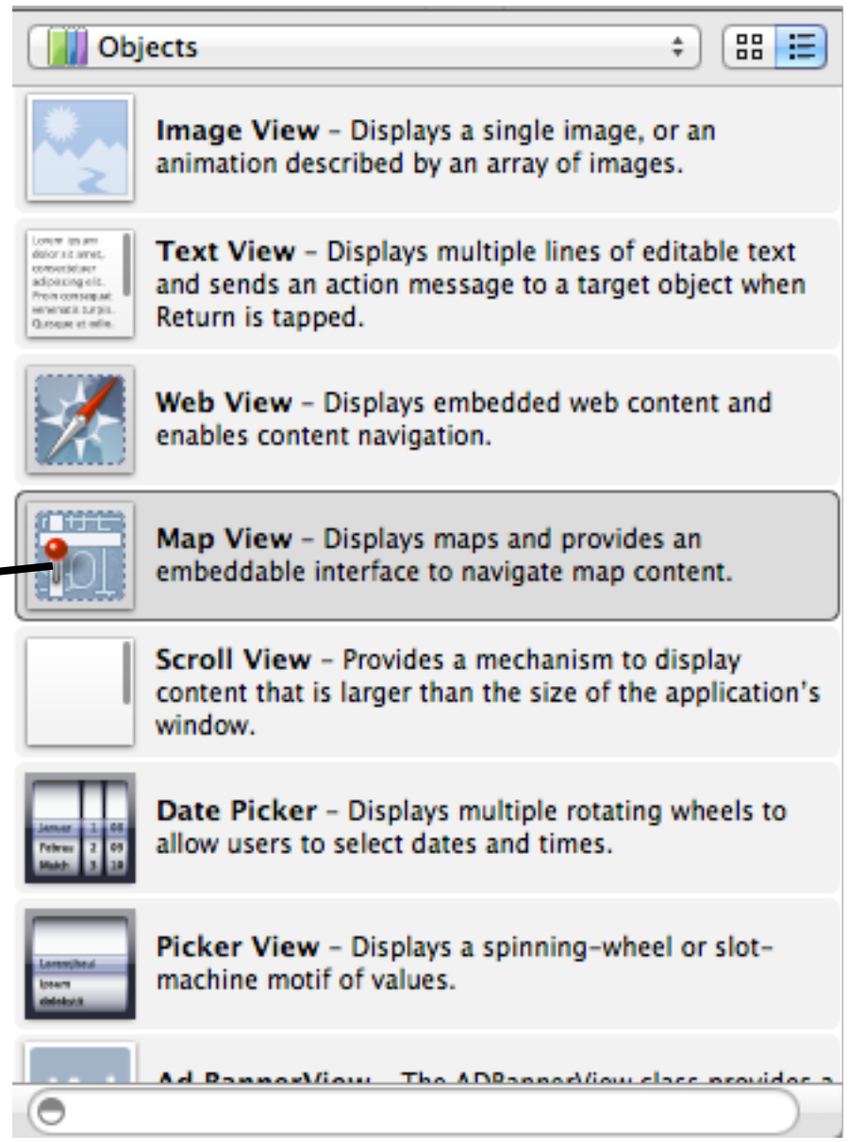
Adding Maps

Adding Maps Steps

1. Add MapView component to view 
2. Add MapKit Framework 
3. Run Application 

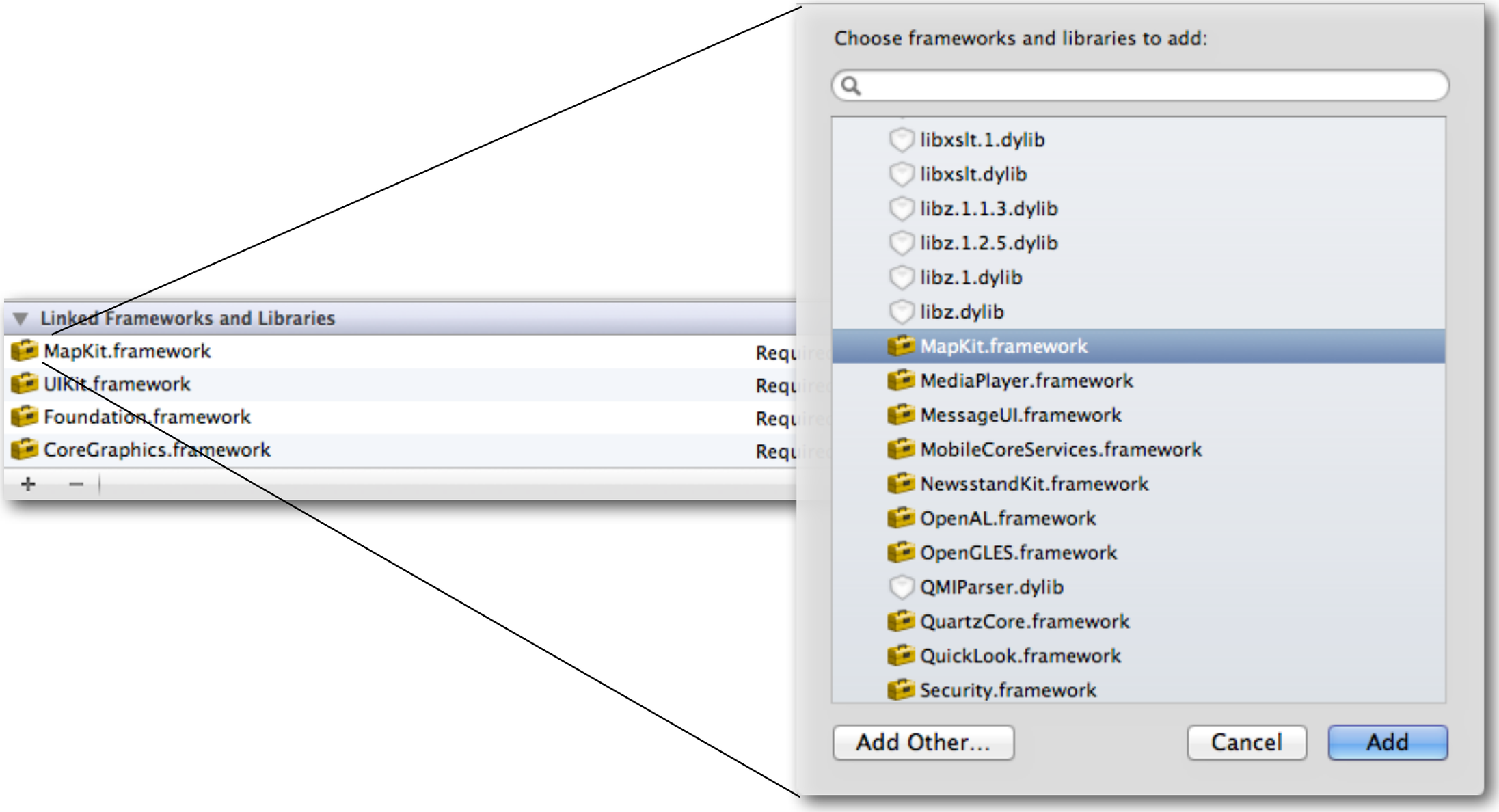
Add Map View Component



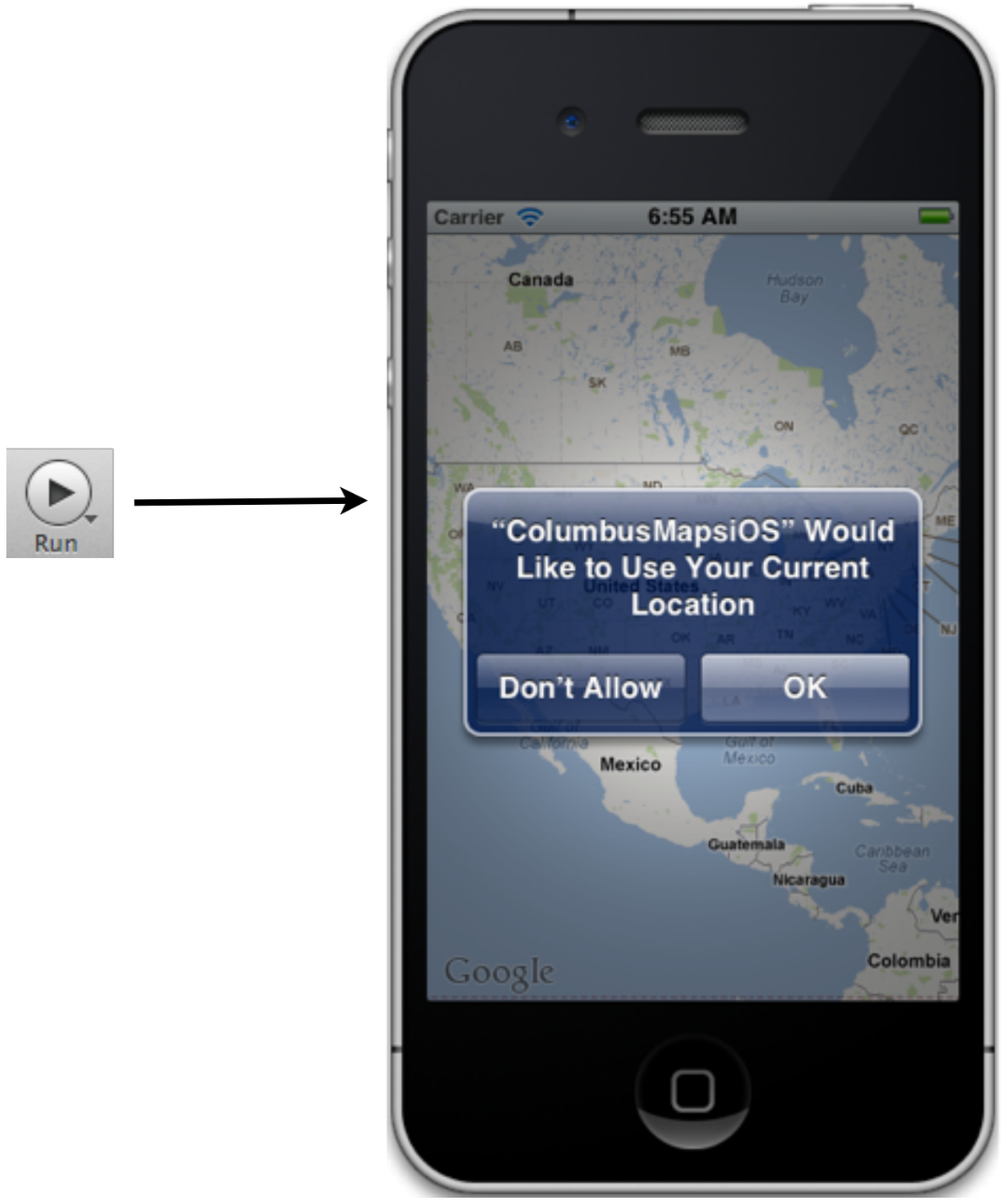


```
2012-06-29 06:10:37.505 ColumbusMapsiOS[11781:f803] *** Terminating
app due to uncaught exception 'NSInvalidUnarchiveOperationException',
reason: 'Could not instantiate class named MKMapView'
*** First throw call stack:
(0x13c7022 0x1558cd6 0x136fa48 0x136f9b9 0x3324a3 0x33267b 0x332383
0x43002 0x332c6e 0x332383 0x232cad 0x332c6e 0x33267b 0x332383 0x232105
0xd81fc 0xd8779 0xd899b 0x37401 0x37670 0x37836 0xc881dd8 0x3e72a
0xf596 0x10274 0x1f183 0x1fc38 0x13634 0x12b1ef5 0x139b195 0x12ffff2
0x12fe8da 0x12fdd84 0x12fdc9b 0xfc65 0x11626 0x212d 0x2095 0x1)
terminate called throwing an exception
```

Add MapKit Framework



Run Application



https://developers.google.com/maps/iphone/terms

Google Maps API

Google Maps Terms of Service

Last updated: March 17, 2009

Thank you for your interest in using Google Maps as part of the iPhone SDK. These Google Maps Terms of Service govern your use of Google Maps accessed through the Apple iPhone SDK. Google Maps development using the iPhone SDK provides a collection of services that allow you to include maps, geocoding, and other Content from Google in your applications.

1. Your relationship with Google.

1.1 Use of the Service is Subject to these Terms. Your use of the Google Maps API (referred to in this document as the **"Maps API"** or the **"Service"**) is subject to the terms of a legal agreement between you and Google Inc., whose principal place of business is at 1600 Amphitheatre Parkway, Mountain View, California 94043, United States (**"Google"**). This legal agreement is referred to as the **"Terms"**.

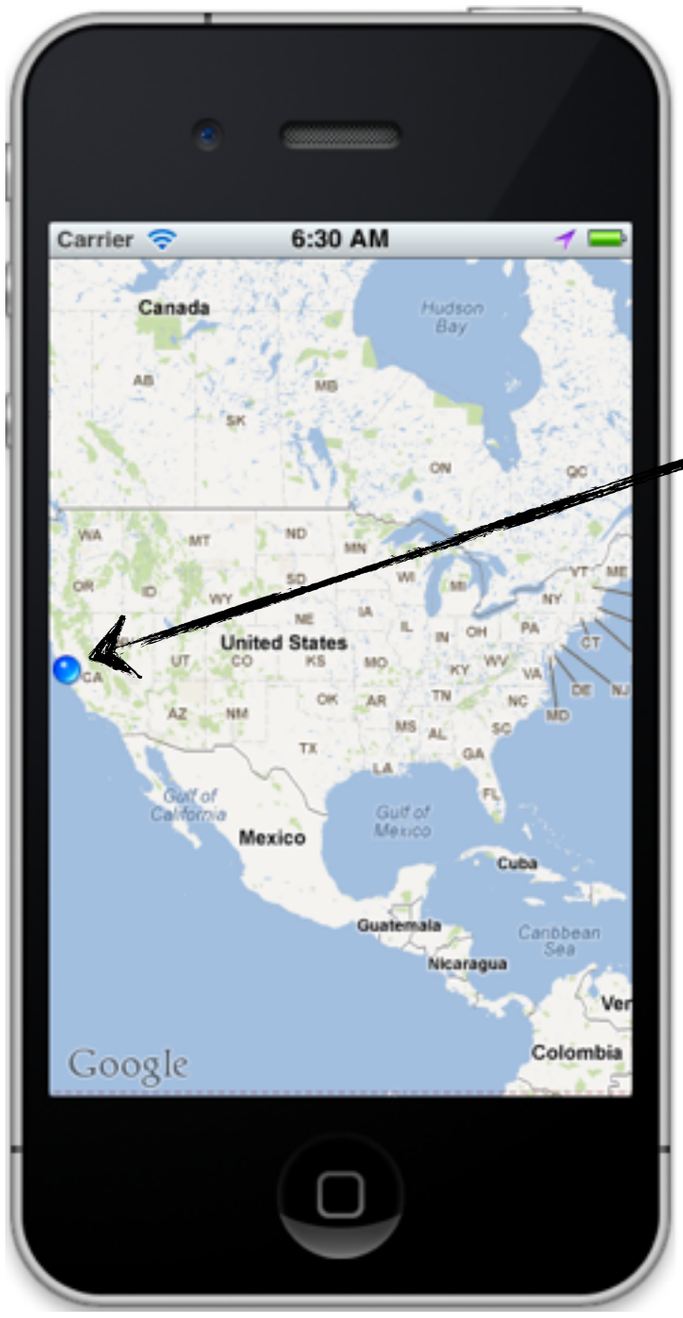
1.2 The Terms include Google's Legal Notices and Privacy Policy.

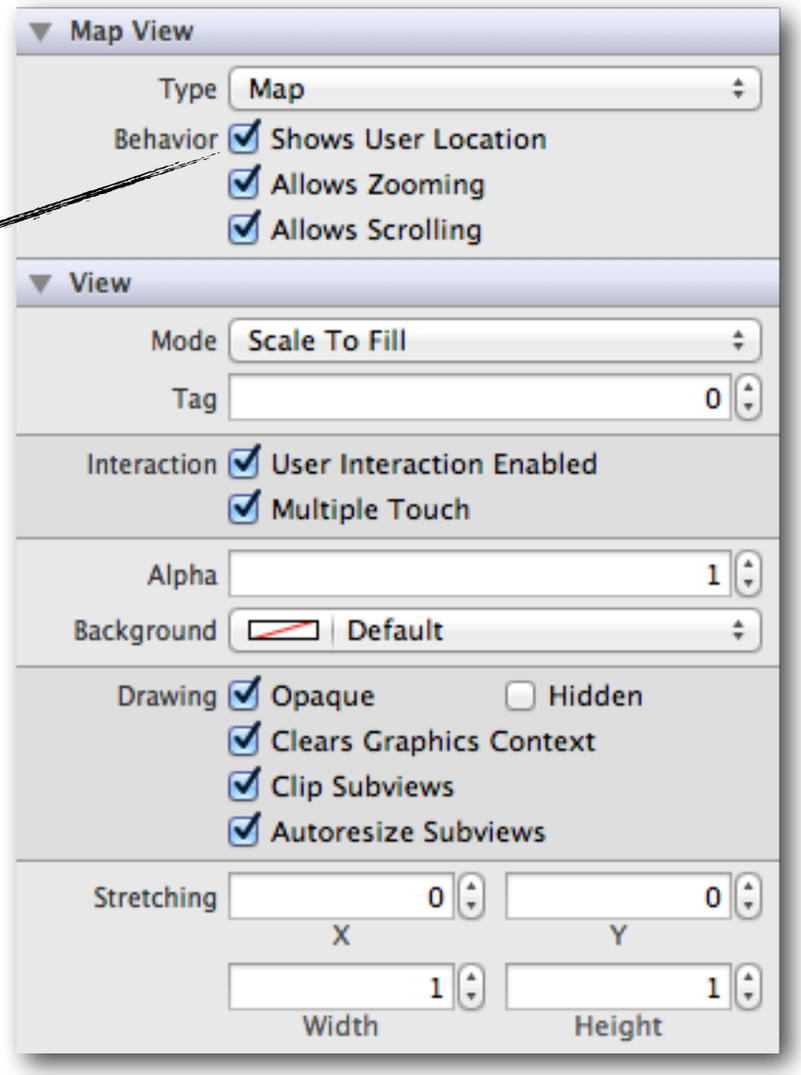
(a) Unless otherwise agreed in writing with Google, the Terms will include the following:
(i) the terms and conditions set forth in this document (the **"Maps API Terms"**.);
(ii) the Legal Notices; and
(iii) the Privacy Policy.

(b) Before you use the Maps API, you should read each of the documents comprising the Terms, and print or

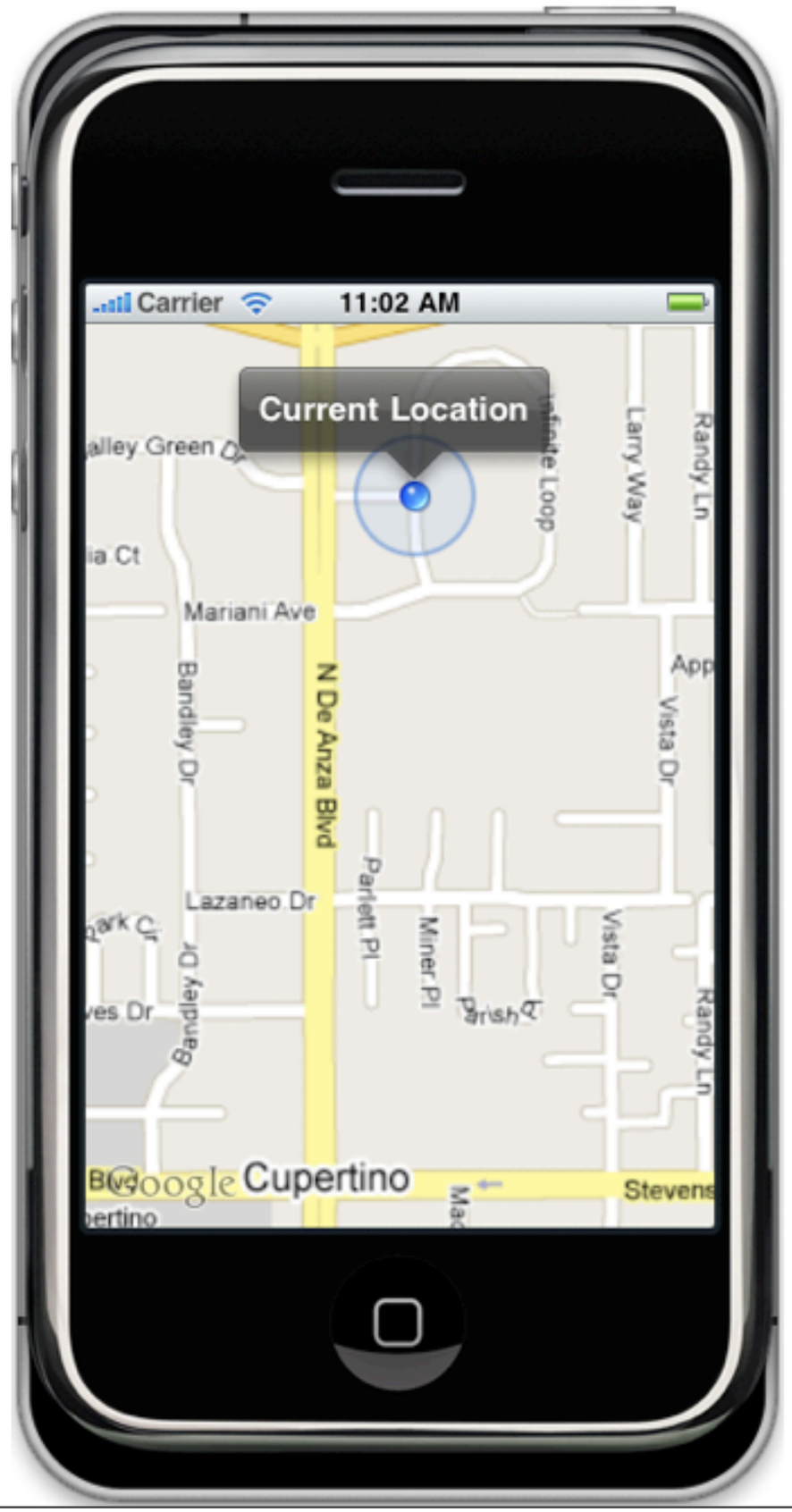
Display Current Location

Show User Location

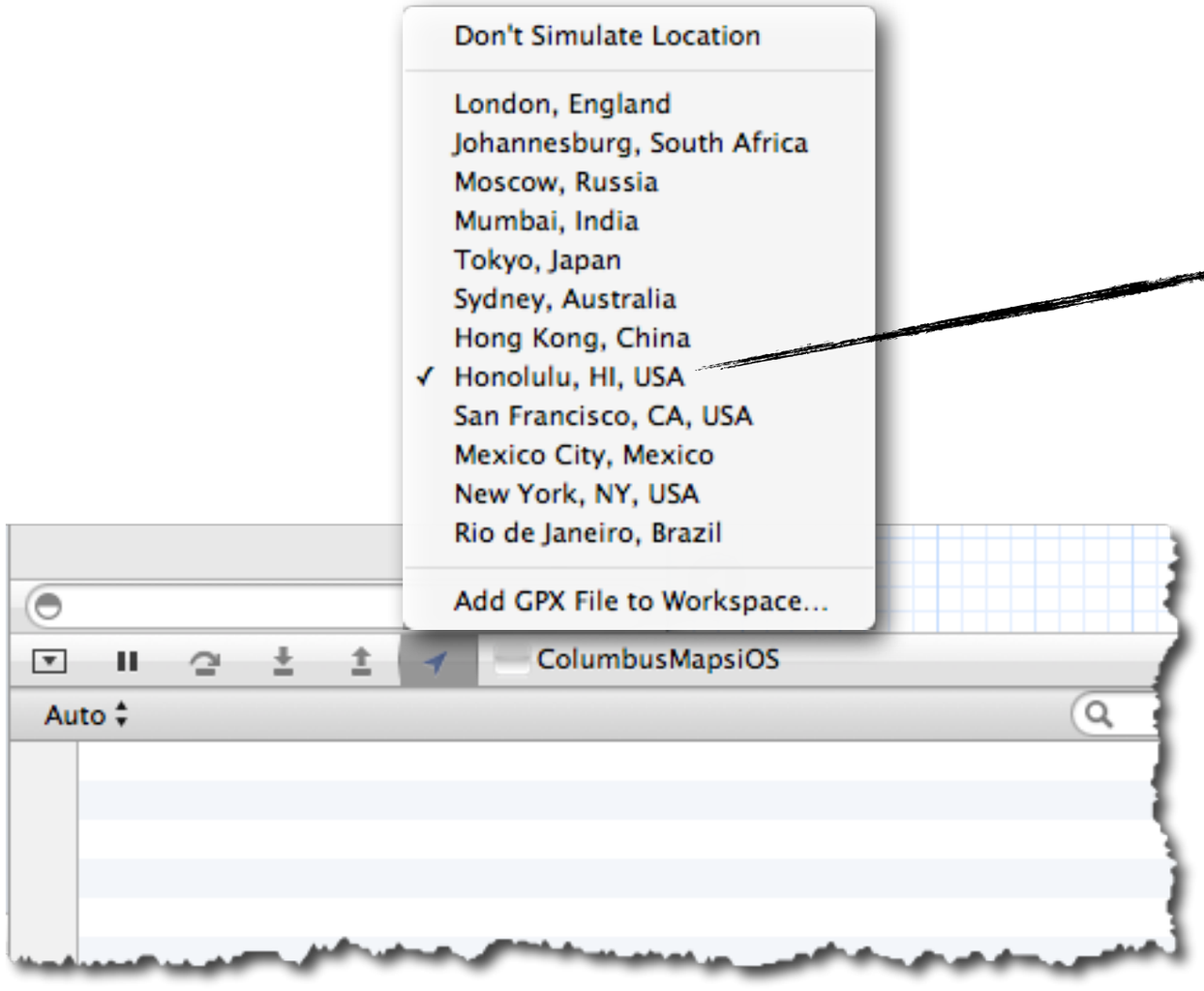


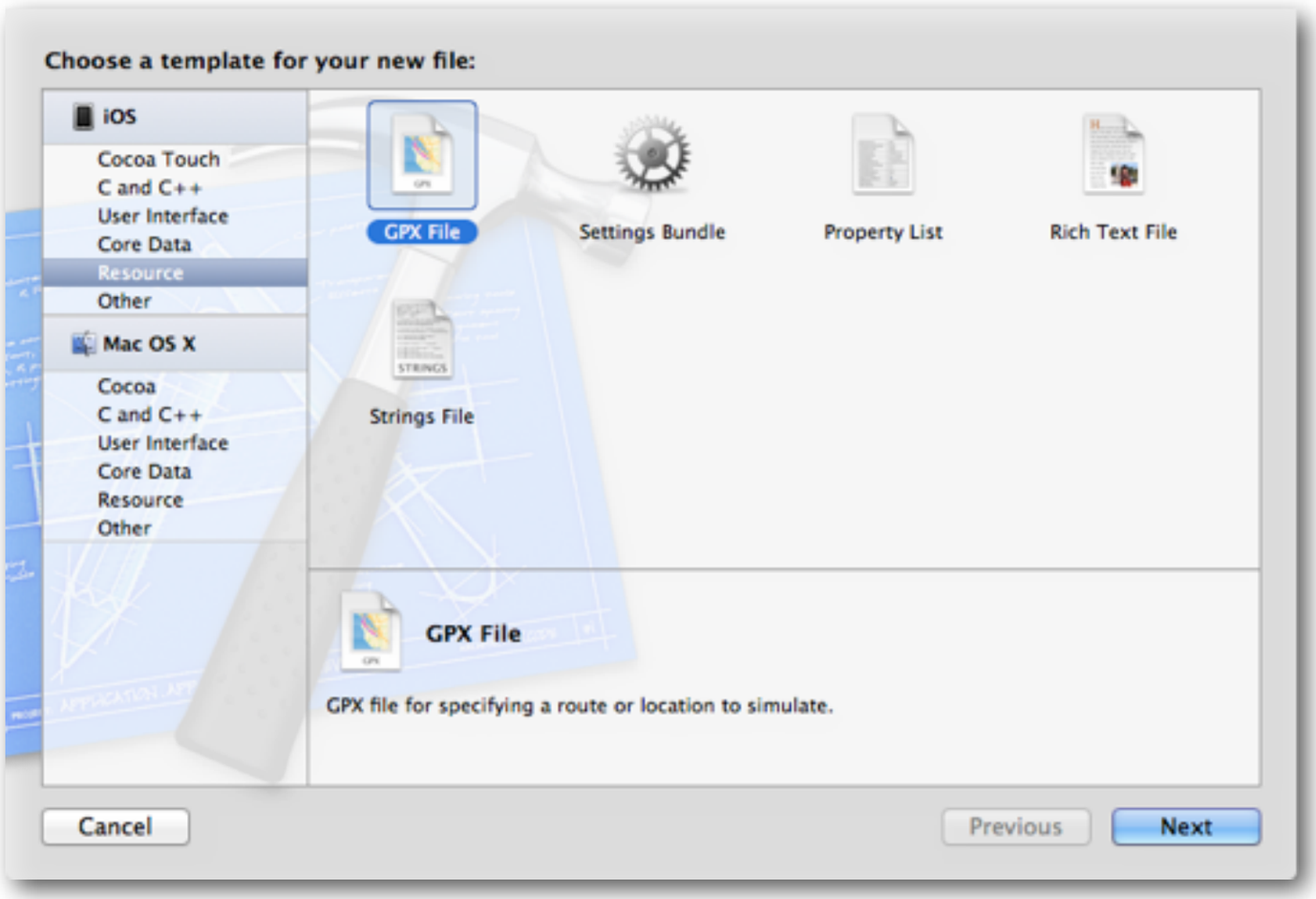


Default Simulator Location



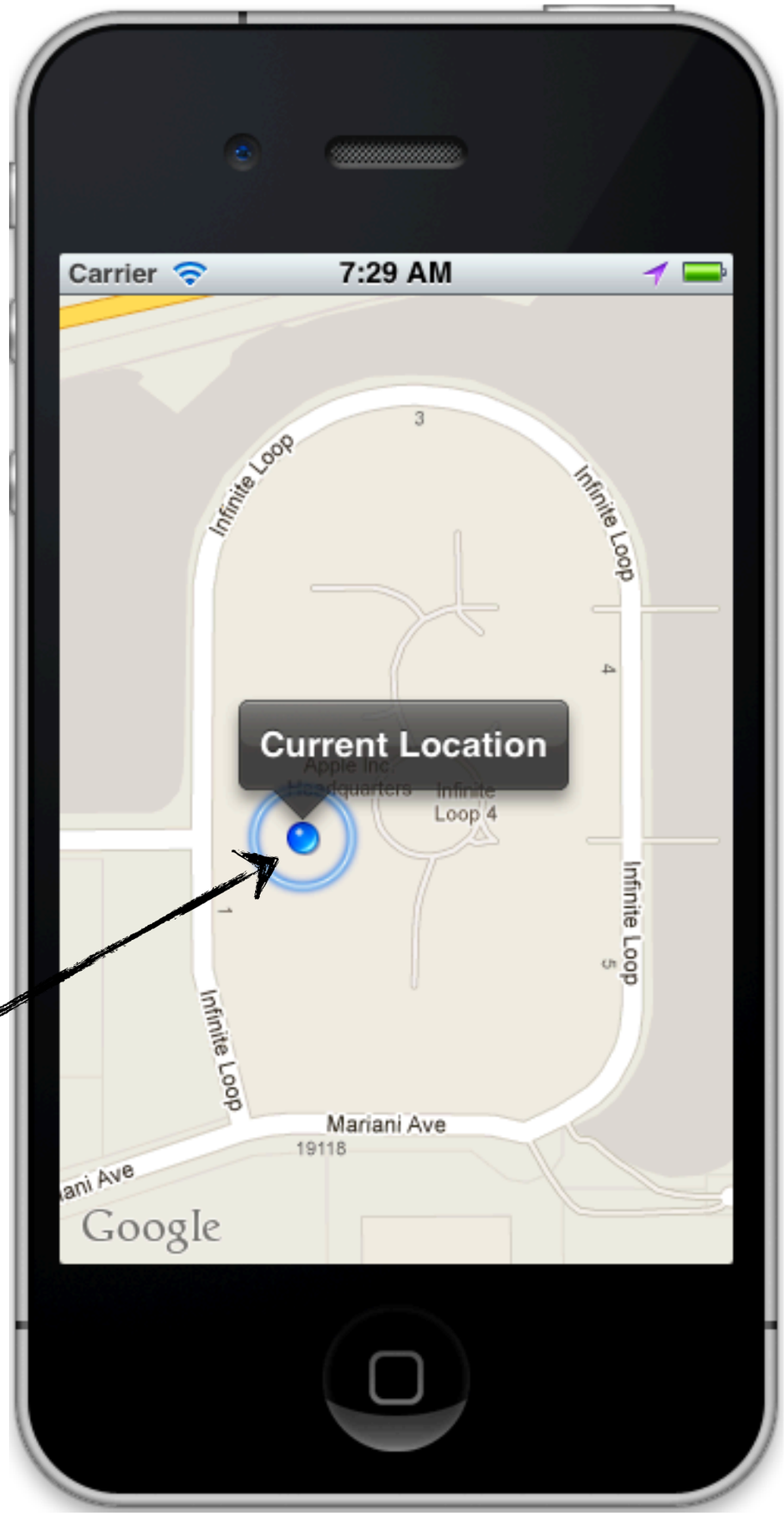
Simulate Location





Location.gpx

```
<?xml version="1.0"?>
<gpx version="1.1" creator="Xcode">

    <wpt lat="37.331705" lon="-122.030237">
        <name>Cupertino</name>
    </wpt>

</gpx>
```



http://www.topografix.com/gpx.asp

GPX The GPS Exchange Format

GPX 1.1 Schema | Documentation | Why support GPX? | Who supports GPX? | Developers Forum | Validating GPX | Examples

GPX: the GPS Exchange Format

WHAT IS GPX?

GPX (the GPS Exchange Format) is a light-weight XML data format for the interchange of GPS data (waypoints, routes, and tracks) between applications and Web services on the Internet.

CURRENT STATUS

The GPX 1.1 schema was released on August 9, 2004. GPX has been the de-facto XML standard for lightweight interchange of GPS data since the initial GPX 1.0 release in 2002. GPX is being used by **dozens of software programs and Web services for GPS data exchange, mapping, and geocaching.**

GPX FOR DEVELOPERS

If you're a developer, read how GPX can help your application or web service.

View the official **GPX 1.1 Schema.**

Read the **GPX 1.1 Documentation.**

Learn **how to validate** your GPX output.

View the official **GPX 1.1 Schema.**

GPX is an open development effort. To participate in the future development of GPX, join the **GPX Developers Forum.**

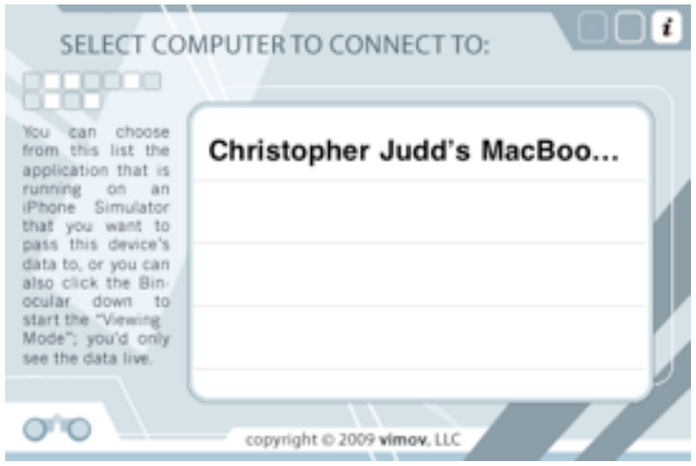
USER BENEFITS OF GPX

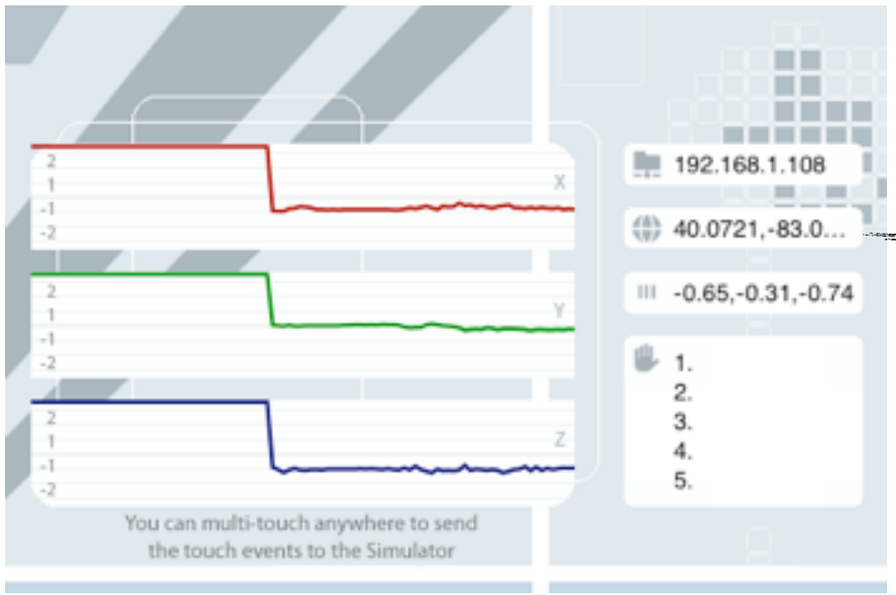
If you own a GPS, find out **how GPX is helping** to make all your **favorite applications** work together.

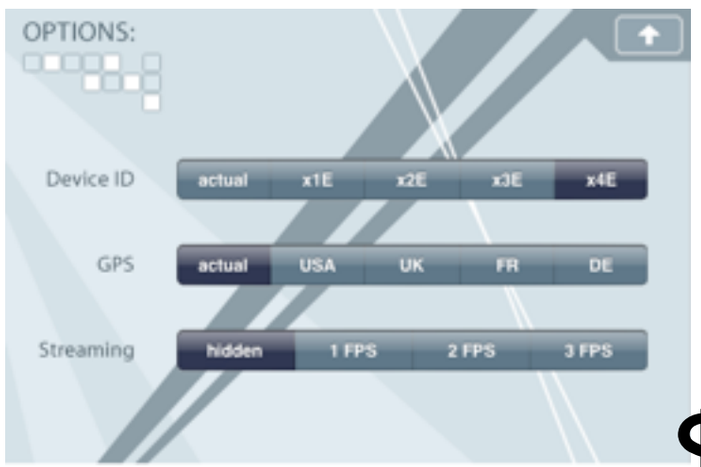
COMMENTS

To ask questions about the GPX format or propose changes, please join the **GPX Developers Forum.** If you have a customer support question regarding the GPX brand of CD players, alarm clocks, and other consumer electronics, **visit www.gpx.com.**

iSimulate

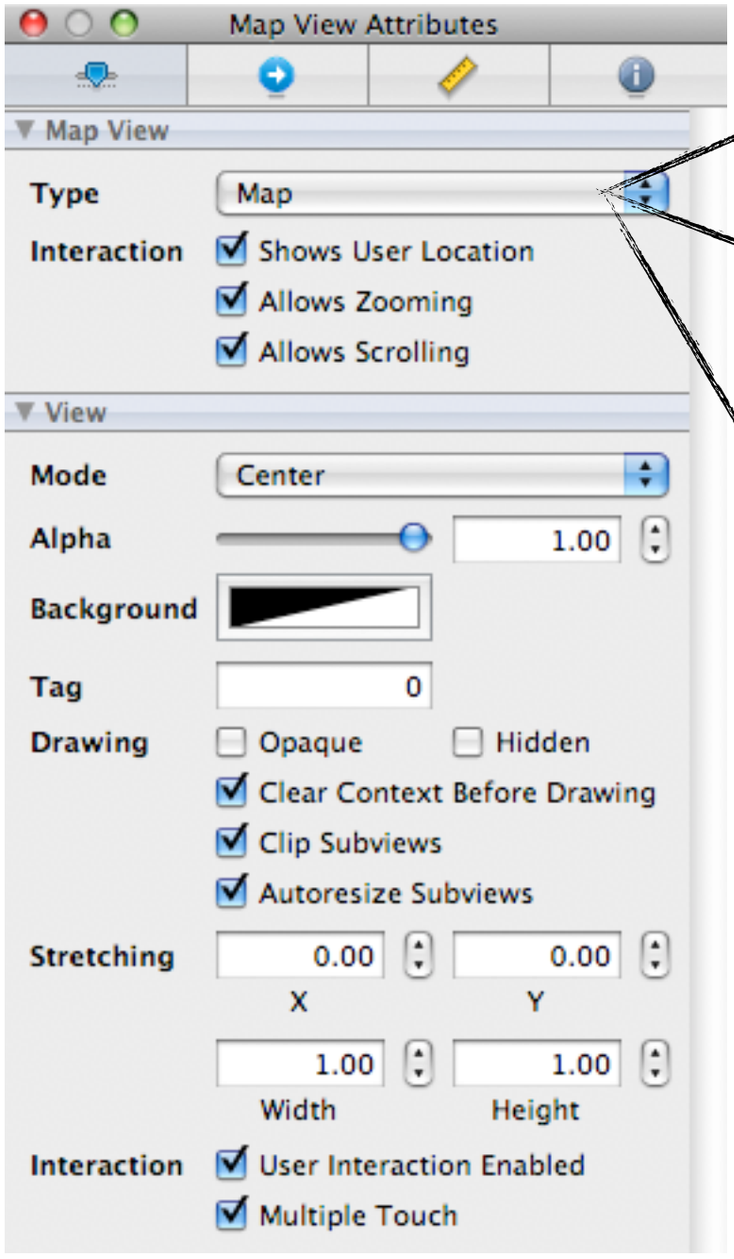






$15.99 in App Store

Change Map Types



Map

Satellite

Hybrid

```
switch (((UISegmentedControl *)sender).selectedSegmentIndex)
{
    case 0: {
        mapView.mapType = MKMapTypeStandard;
        break;
    }
    case 1: {
        mapView.mapType = MKMapTypeSatellite;
        break;
    }
    default: {
        mapView.mapType = MKMapTypeHybrid;
        break;
    }
}
```

Map

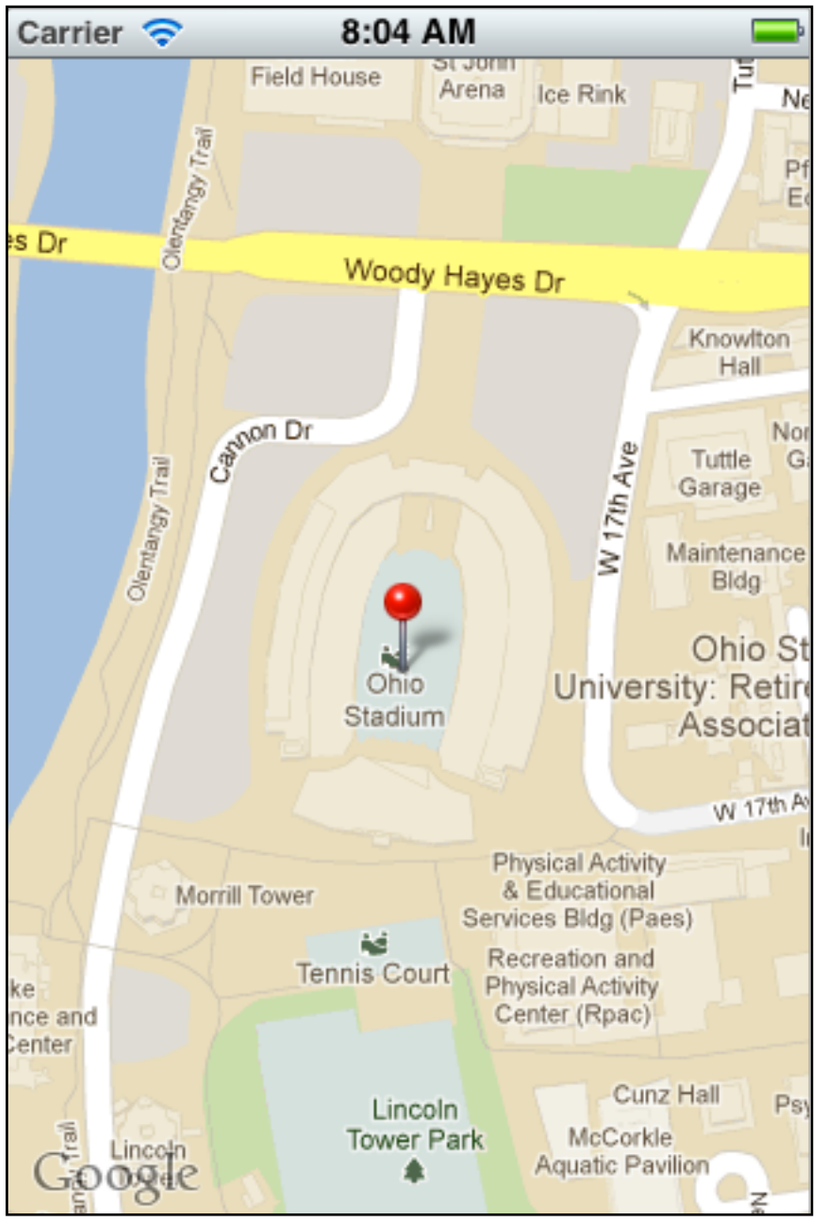
Satellite

Hybrid

Adding Annotations

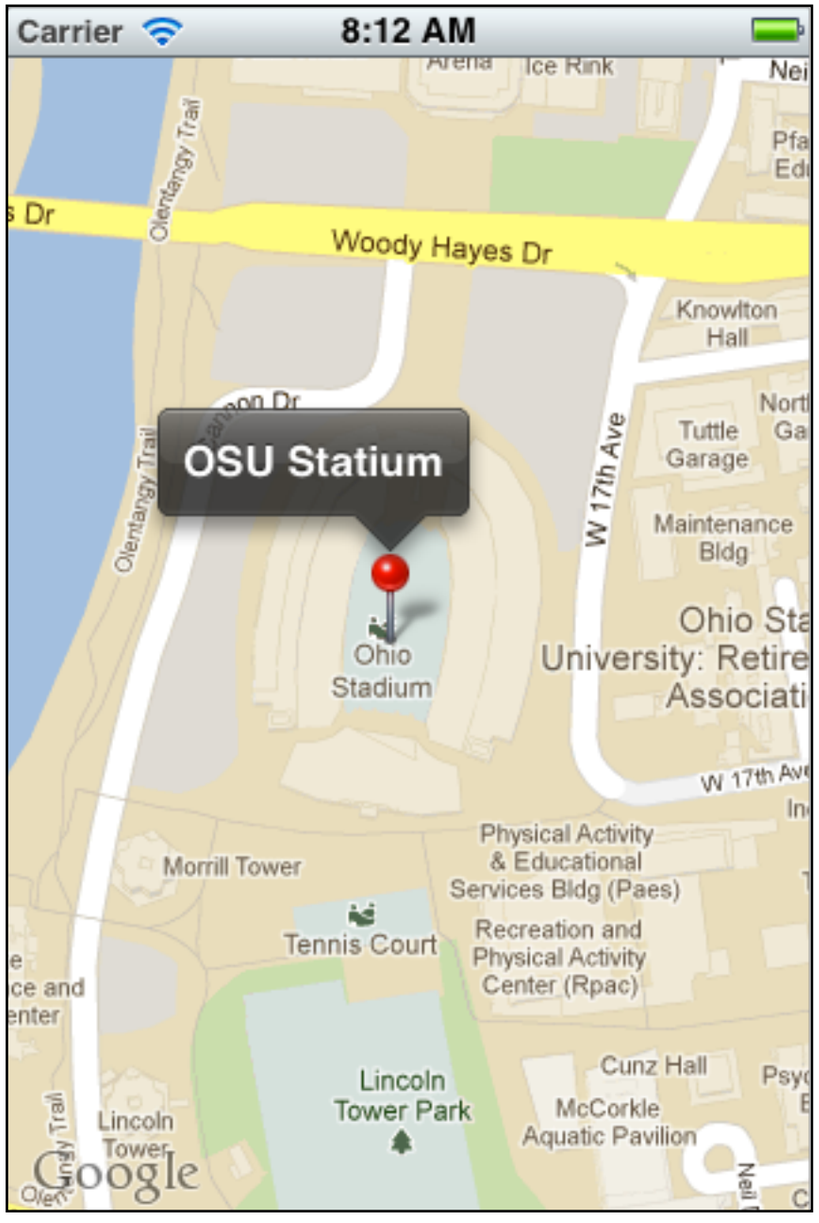
Add Annotation

```
CLLocationCoordinate2D coordinate = {40.001517, -83.019755};
MKPointAnnotation* point = [MKPointAnnotation alloc];
point.coordinate = coordinate;

[mapView addAnnotation:point];
```



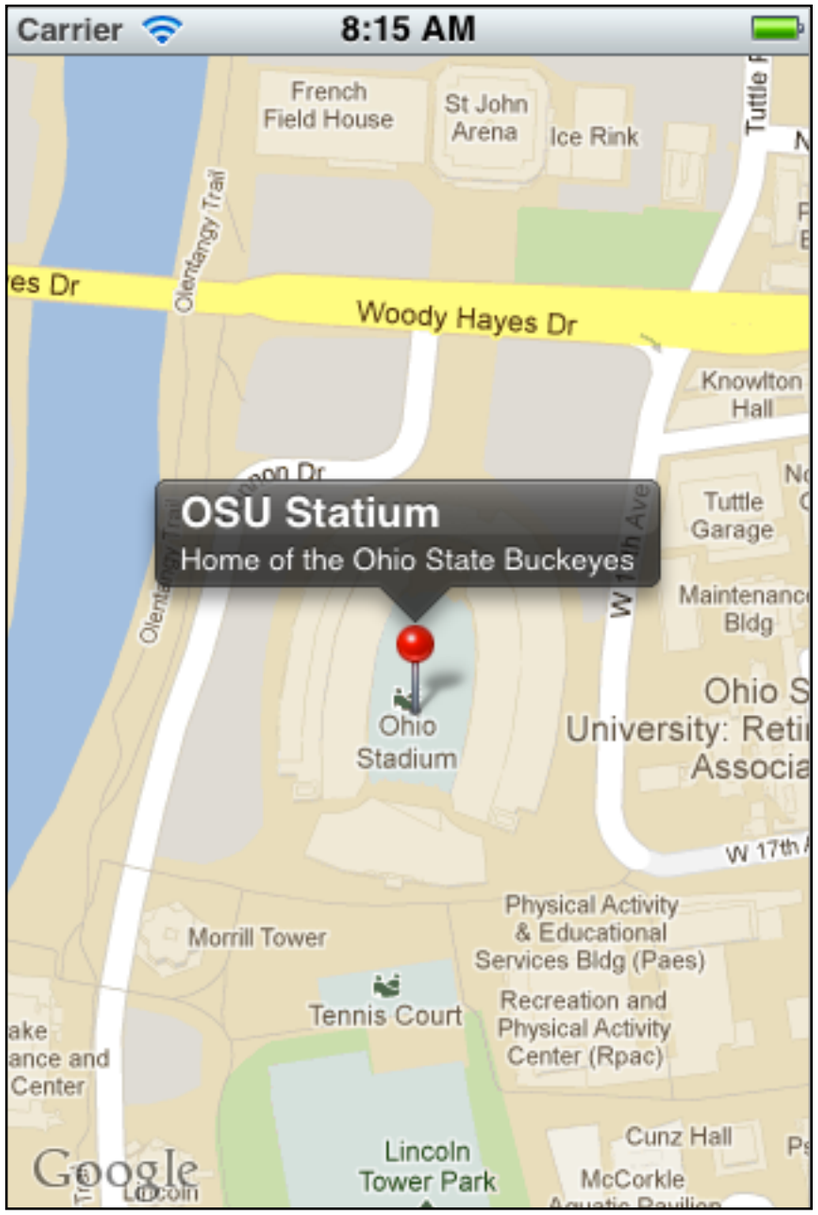
Add Annotation

```
CLLocationCoordinate2D coordinate = {40.001517, -83.019755};
MKPointAnnotation* point = [MKPointAnnotation alloc];
point.coordinate = coordinate;
point.title = @"OSU Statium";

[mapView addAnnotation:point];
```



Add Annotation

```
CLLocationCoordinate2D coordinate = {40.001517, -83.019755};
MKPointAnnotation* point = [MKPointAnnotation alloc];
point.coordinate = coordinate;
point.title = @"OSU Statium";
point.subtitle = @"Home of the Ohio State Buckeyes";

[mapView addAnnotation:point];
```



Custom Annotations

```objc
#import <Foundation/Foundation.h>
#import <MapKit/MapKit.h>

@interface JSCMHistoryMarker : NSObject <MKAnnotation>

@property (nonatomic, assign) CLLocationCoordinate2D coordinate;
@property (nonatomic, copy) NSString *name;
@property (nonatomic, copy) NSString *description;
@property (nonatomic, assign) BOOL church;

+ (JSCMHistoryMarker*)createHistoryMarker:(NSString*) name latitude: (CLLocationDegrees)lat longitude:
(CLLocationDegrees)lng;
+ (JSCMHistoryMarker*)createChurchMarker:(NSString*) name latitude: (CLLocationDegrees)lat longitude:
(CLLocationDegrees)lng;

@end
```

implement MKAnnotation

required property

```objc
#import "JSCMHistoryMarker.h"

@implementation JSCMHistoryMarker

@synthesize coordinate;
@synthesize name;
@synthesize description;
@synthesize church;

- (NSString *)title {
    return name;
}

- (NSString *)subtitle {
    return description;
}

//  code removed for brevity
@end
```

optional properties

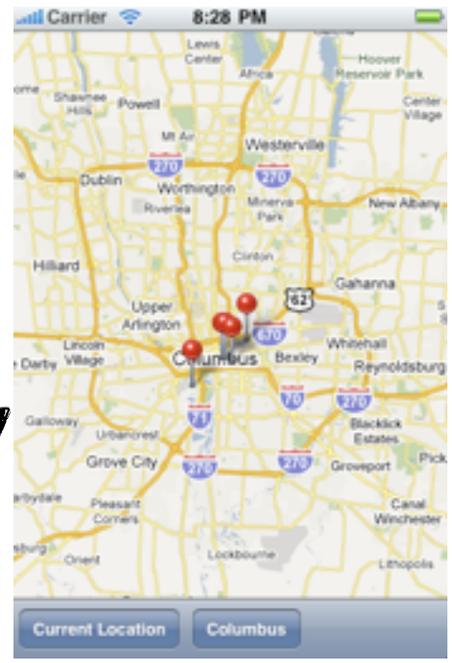
```objc
NSMutableArray* markers = [[NSMutableArray alloc] initWithCapacity:35];

[markers addObject:[JSCMHistoryMarker createHistoryMarker:@"Jesse Owens"
                                                 latitude: 40.012314 longitude: -83.02796]];
[markers addObject:[JSCMHistoryMarker createHistoryMarker:@"Ohio State School for the Blind"
                                                 latitude: 40.068763 longitude: -83.019]];
[markers addObject:[JSCMHistoryMarker createChurchMarker:@"St. Paul African Methodist Episcopal Church"
                                                 latitude: 39.966964 longitude: -82.9834]];
[markers addObject:[JSCMHistoryMarker createHistoryMarker:@"The Ohio State Fair"
                                                 latitude: 40.000943 longitude: -82.98899]];

[mapView addAnnotations: markers];
```

Positioning Map

Multiple Pins Can be hard to see from far away

Applications with a geographical focus should frame the region

Zooming

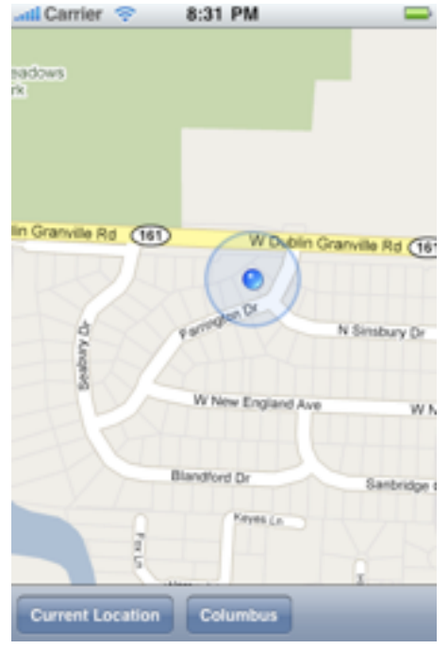



```
- (IBAction)zoomColumbus:(id)sender {

   CLLocationCoordinate2D columbusCenterCoordinate = {39.971793, -82.983396};
   MKCoordinateSpan span = MKCoordinateSpanMake( 0.390456, 0.390456);
   MKCoordinateRegion region = MKCoordinateRegionMake(columbusCenterCoordinate, span);
   [mapView setRegion:region animated:TRUE];
}
```

delta in degrees

```
- (IBAction)zoomCurrentLocation:(id)sender {

   MKCoordinateRegion region = MKCoordinateRegionMakeWithDistance(
            mapView.userLocation.location.coordinate, 500, 500);
   [mapView setRegion:region animated:TRUE];

}
```

meters



Decorating Annotations

Changing Annotation Appearance

Implement MKMapViewDelegate protocol

*Controller.h

```
@interface ColumbusHistoryMapViewController : UIViewController <MKMapViewDelegate> {

}

@property (nonatomic, retain) MKMapView* mapView;

@end
```

*Controller.m

```
@implementation ColumbusHistoryMapViewController

- (void)viewDidLoad {
    [super viewDidLoad];
    mapView.delegate = self;

    // Details removed for brevity
}

- (MKAnnotationView *)mapView:(MKMapView *)mapView viewForAnnotation:(id <MKAnnotation>)annotation {
   if(annotation == mapView.userLocation) { return nil; }

    // Details removed for brevity

   return annotationView;
}

// Details removed for brevity

@end
```

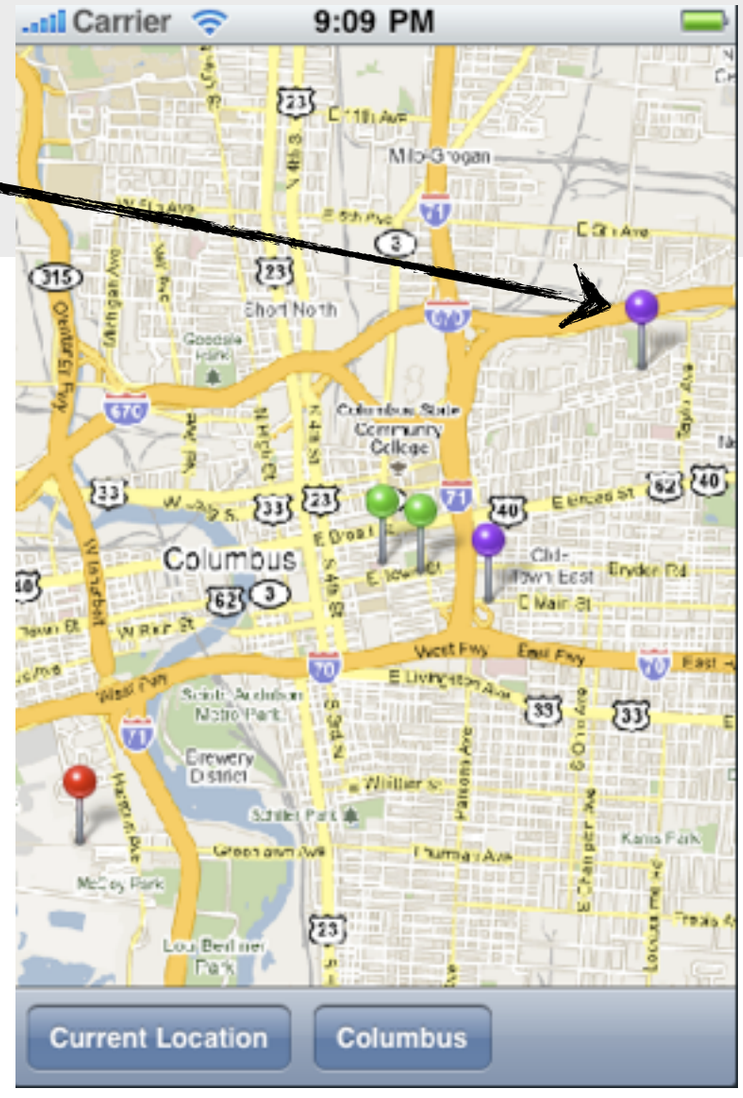
Assign delegate

Implement viewForAnnotation

Returning nil will perform default behavior

Coloring Pins

```
- (MKAnnotationView *)mapView:(MKMapView *)mapView viewForAnnotation:(id <MKAnnotation>)annotation {
    if(annotation == mapView.userLocation) { return nil; }

    MKPinAnnotationView *annotationView = nil;
    annotationView = (MKPinAnnotationView*)[mapView dequeueReusableAnnotationViewWithIdentifier:@"historyMarker"];
    if(nil == annotationView) {
        annotationView = [[MKPinAnnotationView alloc] initWithAnnotation:annotation reuseIdentifier:@"historyMarker"];
    }

    annotationView.pinColor = MKPinAnnotationColorPurple;

    return annotationView;
}
```

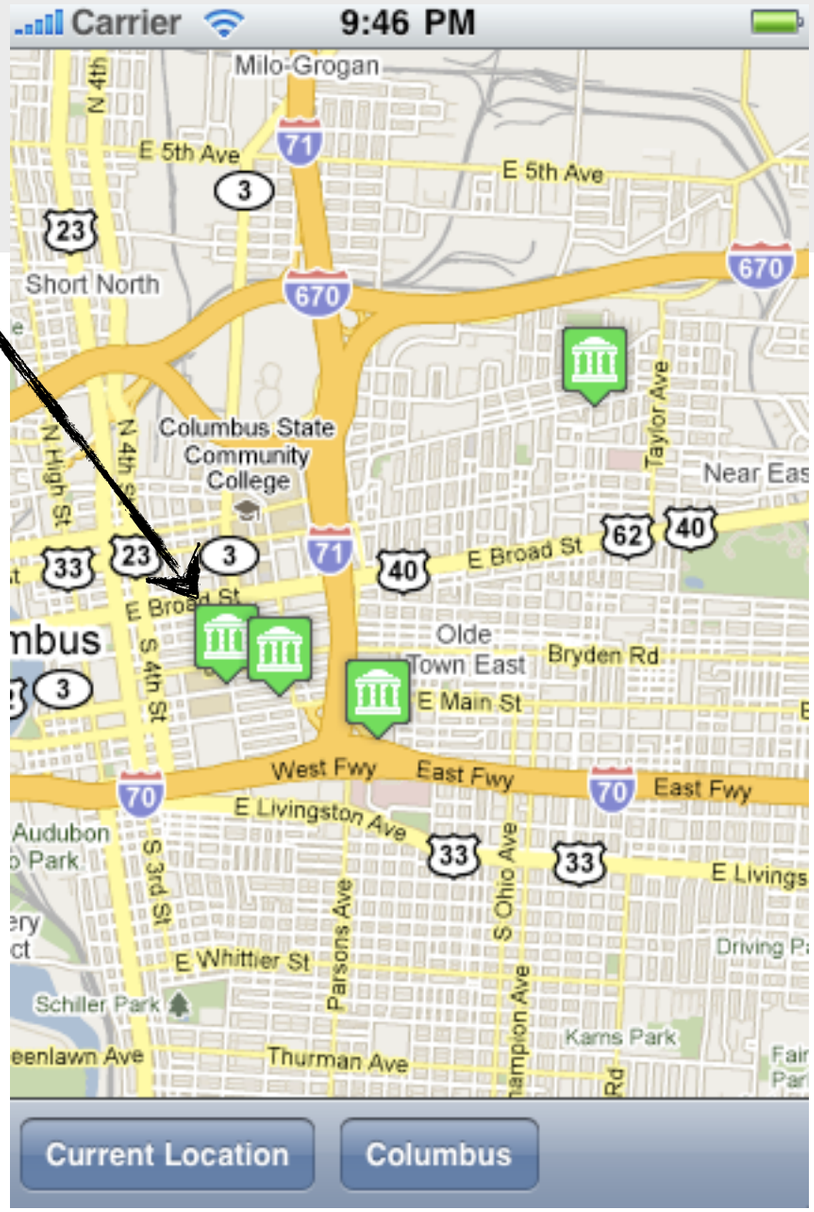


Limited to 3 colors

MKPinAnnotationColorPurple
MKPinAnnotationColorRed
MKPinAnnotationColorGreen

Annotation Images

```
- (MKAnnotationView *)mapView:(MKMapView *)mapView viewForAnnotation:(id <MKAnnotation>)annotation {
   if(annotation == mapView.userLocation) { return nil; }

   MKAnnotationView *annotationView = nil;
   annotationView = (MKAnnotationView*)[mapView dequeueReusableAnnotationViewWithIdentifier:@"historyMarker"];
   if(nil == annotationView) {
           annotationView = [[MKAnnotationView alloc] initWithAnnotation:annotation reuseIdentifier:@"historyMarker"];
   }

   annotationView.image = [UIImage imageNamed:@"history.png"];

   return annotationView;
}
```



Free Map Icons

http://code.google.com/p/google-maps-icons/

Administration, Office & Industry

All the icons in this Icon Category described and tagged.

Culture & Entertainment

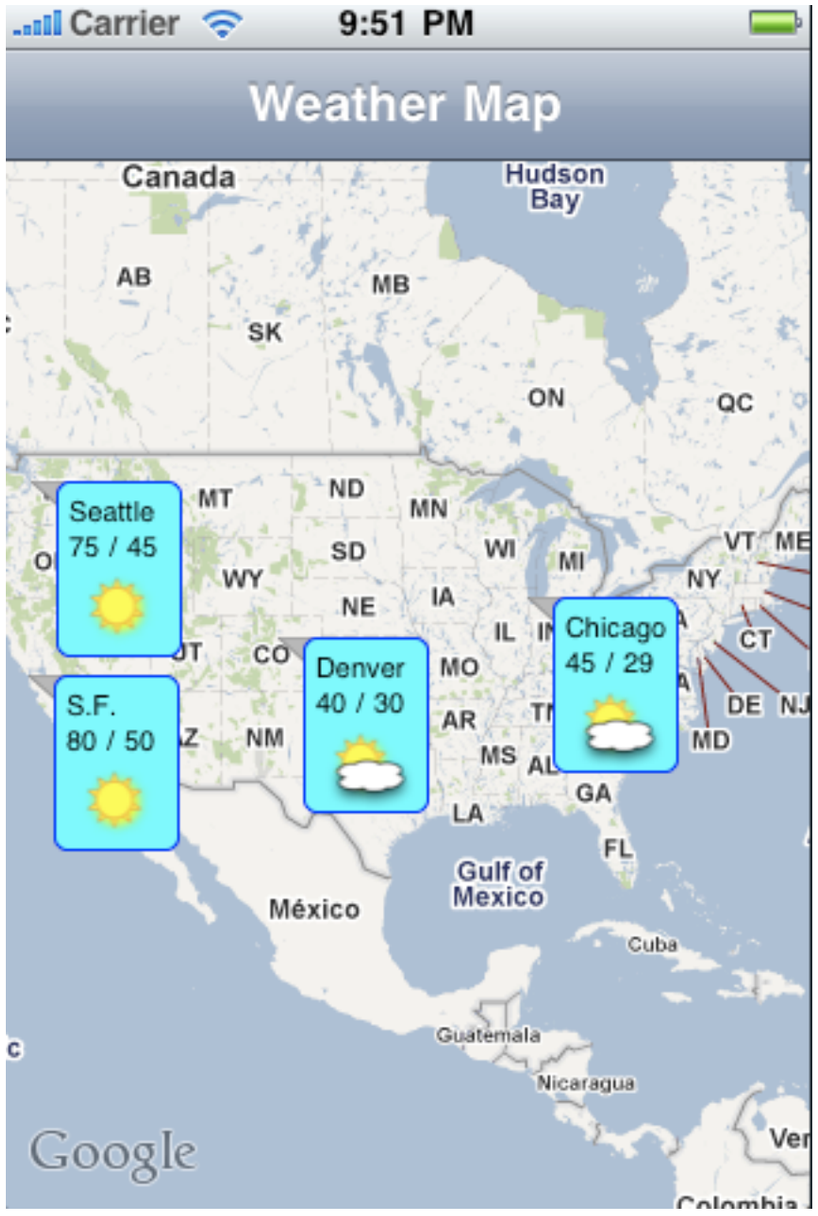
All the icons described and tagged.

Education & Kids

All the icons described and tagged.

Events & Weather

All the icons described and tagged.


Carrier
9:51 PM
Weather Map
Canada
Hudson Bay
AB
MB
SK
ON
QC
Seattle
75 / 45
MT
ND
MN
SD
WI
MI
WY
NE
IA
IL
Chicago
45 / 29
VT
ME
NY
CT
DE
NJ
MD
CO
Denver
40 / 30
MO
AR
MS
AL
GA
LA
FL
NM
S.F.
80 / 50
Gulf of Mexico
México
Cuba
Guatemala
Nicaragua
Google


AT&T
9:53 PM
Detroit
Toledo
Findlay
Lima
Dayton
Springfield
Cincinnati
Huntington
Charleston
Lexington-Fayette
West Virginia
Google

Be Creative

Callouts

Enable Callouts

```
- (MKAnnotationView *)mapView:(MKMapView *)mapView viewForAnnotation:(id <MKAnnotation>)annotation {
   if(annotation == mapView.userLocation) { return nil; }

   MKAnnotationView *annotationView = nil;
   annotationView = (MKAnnotationView*)[mapView dequeueReusableAnnotationViewWithIdentifier:@"historyMarker"];
   if(nil == annotationView) {
           annotationView = [[MKAnnotationView alloc] initWithAnnotation:annotation reuseIdentifier:@"historyMarker"];
   }

   annotationView.image = [UIImage imageNamed:@"history.png"];
   annotationView.canShowCallout = YES;

   return annotationView;
}
```

Set canShowCallout

Implement title and optionally subtitle on MKAnnotation Implementation

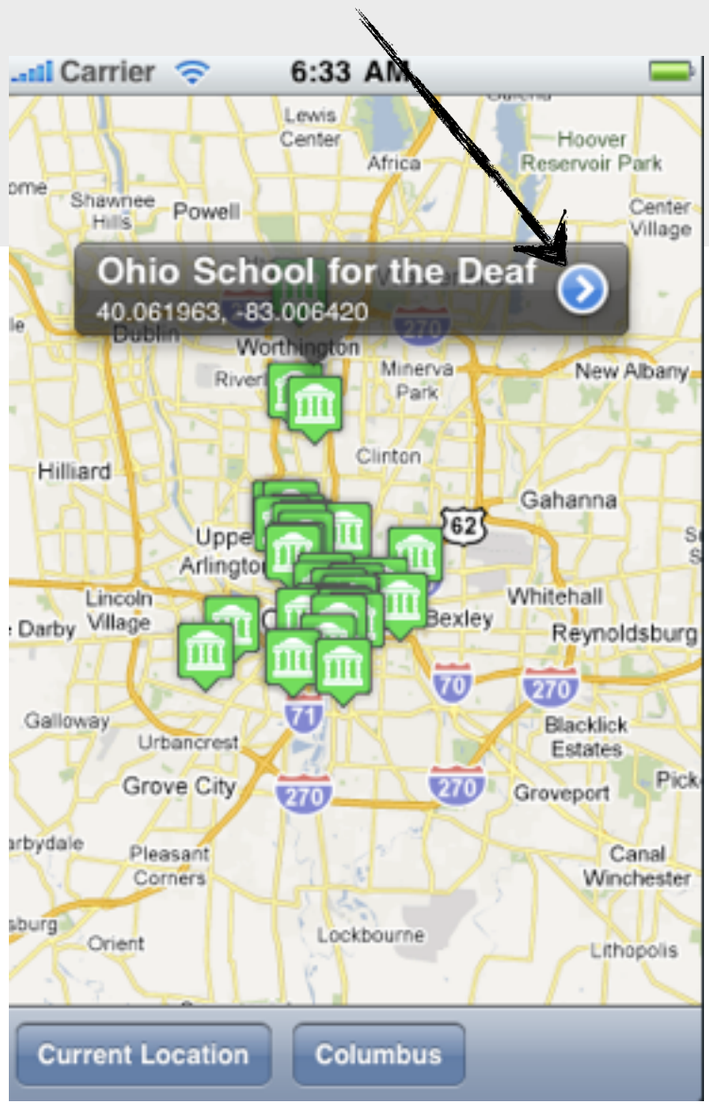
```
@implementation HistoryMarker

- (NSString *)title {
   return _name;
}

- (NSString *)subtitle {
   return [NSString stringWithFormat:@"%f, %f", _coordinate.latitude, _coordinate.longitude];
}

@end
```

Add Behavior to Callouts

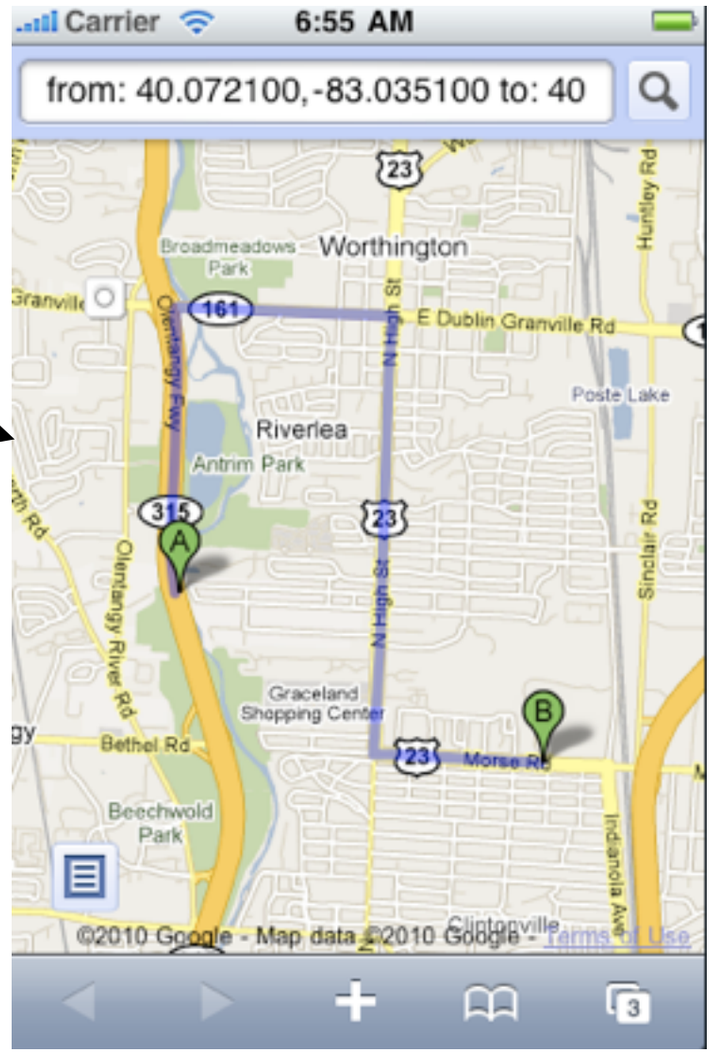
```
- (MKAnnotationView *)mapView:(MKMapView *)mapView viewForAnnotation:(id <MKAnnotation>)annotation {
  if(annotation == mapView.userLocation) { return nil; }

  MKAnnotationView *annotationView = nil;
  annotationView = (MKAnnotationView*)[mapView dequeueReusableAnnotationViewWithIdentifier:@"historyMarker"];
  if(nil == annotationView) {
          annotationView = [[MKAnnotationView alloc] initWithAnnotation:annotation reuseIdentifier:@"historyMarker"];
  }

  annotationView.rightCalloutAccessoryView = [UIButton buttonWithType:UIButtonTypeDetailDisclosure];
  annotationView.image = [UIImage imageNamed:@"history.png"];
  annotationView.canShowCallout = YES;

  return annotationView;
}
```

Implement calloutAccessoryControlTapped

```
- (void)mapView:(MKMapView *)mapView annotationView:(MKAnnotationView *)view
      calloutAccessoryControlTapped:(UIControl *)control {

   HistoryMarker* historyMarker = (HistoryMarker*)view.annotation;
   NSLog(@"Historical Marker %@ was selected.", historyMarker.name);
   //Could open a detail view, navigate to a website, call, etc.

}
```



Directions




```
- (void)mapView:(MKMapView *)mapView annotationView:(MKAnnotationView *)view
        calloutAccessoryControlTapped:(UIControl *)control {

   HistoryMarker* historyMarker = (HistoryMarker*)view.annotation;

   NSString* url = [NSString stringWithFormat:@"http://maps.google.com/maps?daddr=%f,%f&saddr=%f,%f",
                            historyMarker.coordinate.latitude, historyMarker.coordinate.longitude,
                            mapView.userLocation.location.coordinate.latitude,
                            mapView.userLocation.location.coordinate.longitude];
   [[UIApplication sharedApplication] openURL:[NSURL URLWithString:url]];
}
```

http://mapki.com/index.php?title=Google_Map_Parameters

Alternatives

route-me

Open source iPhone-native slippy map.

New Free BSD

OpenStreetMap

The Free Wiki World Map

bing

CLOUD MADE

http://code.google.com/p/route-me/

Bring your own maps? Bring **CloudMade** Maps.

The iPhone Maps Library lets you build interactive mapping applications for the iPhone. With this API you can:

- Build applications that give users a rich mapping experience on the iPhone
- Benefit from our tile servers which deliver mobile optimized maps to your users
- Easily integrate with the iPhone's location API to show your user's position in real time
- Get more with CloudMade maps than with Google

See some examples

New Release Coming Soon...

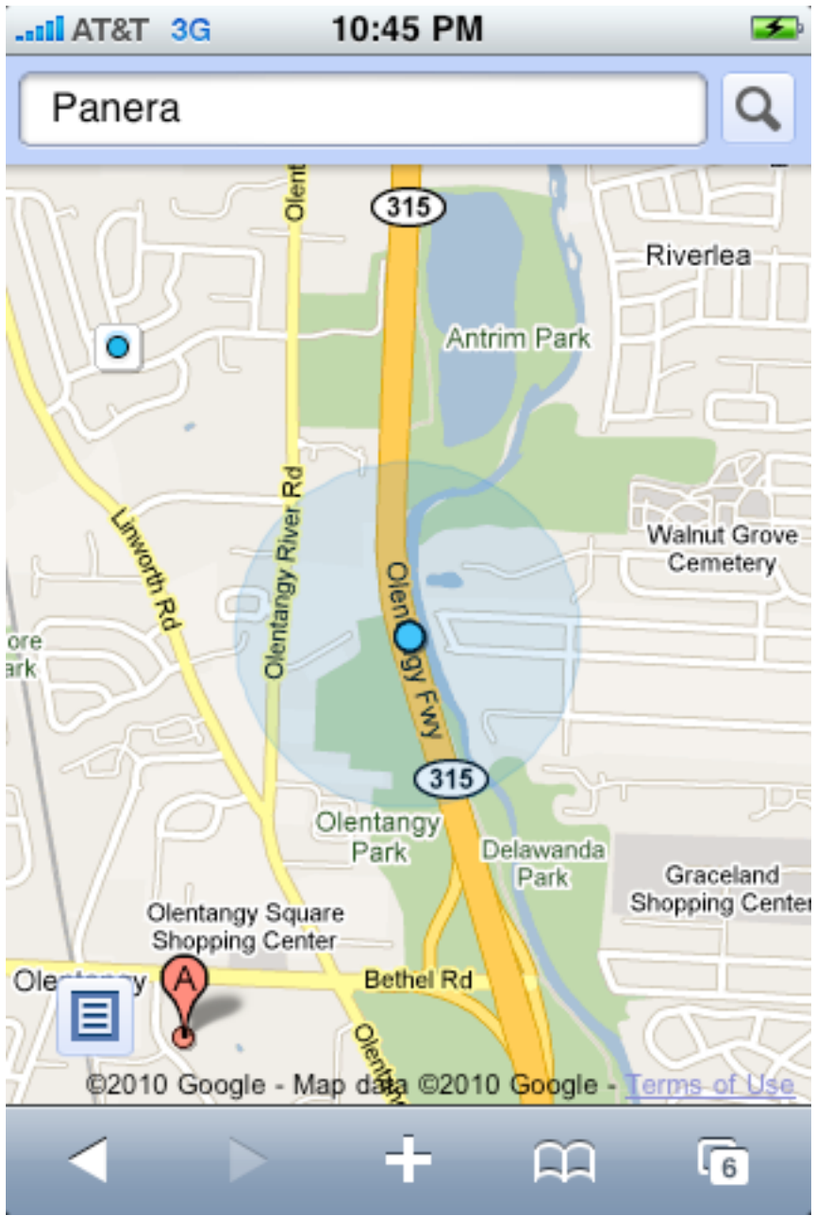
Includes:

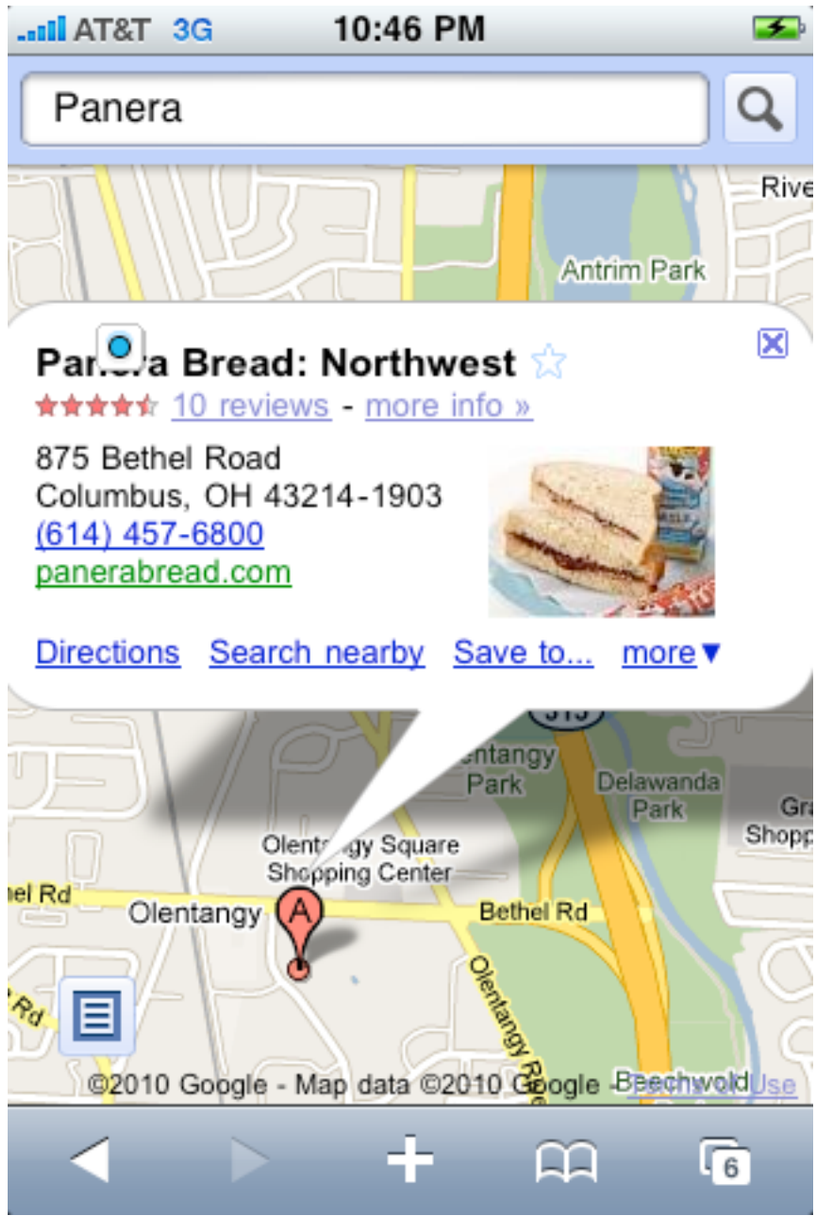
- Native support
- Sponsored Points of Interest and more...

Feature	Google	CloudMade
Multiple map styles	✗	✓
Customizable map styles	✗	✓
Vehicle, Pedestrian, Cycle Routing	✗	✓
Forward Geocoding	✗	✓
Reverse Geocoding	✓	✓
Open source, user extendable library	✗	✓

http://developers.cloudmade.com/projects/show/iphone-api

Google maps


AT&T 3G
10:45 PM
Panera
315
Riverlea
Antrim Park
Olentangy River Rd
Linworth Rd
Walnut Grove Cemetery
Olentangy Fwy
315
Olentangy Park
Delawanda Park
Graceland Shopping Center
Olentangy Square Shopping Center
Bethel Rd
©2010 Google - Map data ©2010 Google - Terms of Use
6


AT&T 3G
10:46 PM
Panera
Antrim Park
Bread: Northwest
10 reviews - more info »
875 Bethel Road
Columbus, OH 43214-1903
(614) 457-6800
panerabread.com
Directions
Search nearby
Save to...
more
Olentangy Park
Delawanda Park
Olentangy Square Shopping Center
Olentangy
Bethel Rd
©2010 Google - Map data ©2010 Google
6

Saturday, June 30

8:00-9:00	Breakfast		
3:45-4:00	Break		
4:00-5:00	The Wonderful World of Text Chad Sellers	MapKit has Competitors? Walter Tyree	Unit Testing that Doesn't Suck Daniel Steinberg
5:00-5:15	Break		
5:15-5:30	Closing Remarks		

Session Details

MapKit has Competitors?

During the development of an app for cyclists we evaluated a number of mapping solutions for iOS including ArcGIS, Mapquest, Bing, and Cloudmade in addition to MapKit. Come hear about what we learned and which one we settled on.

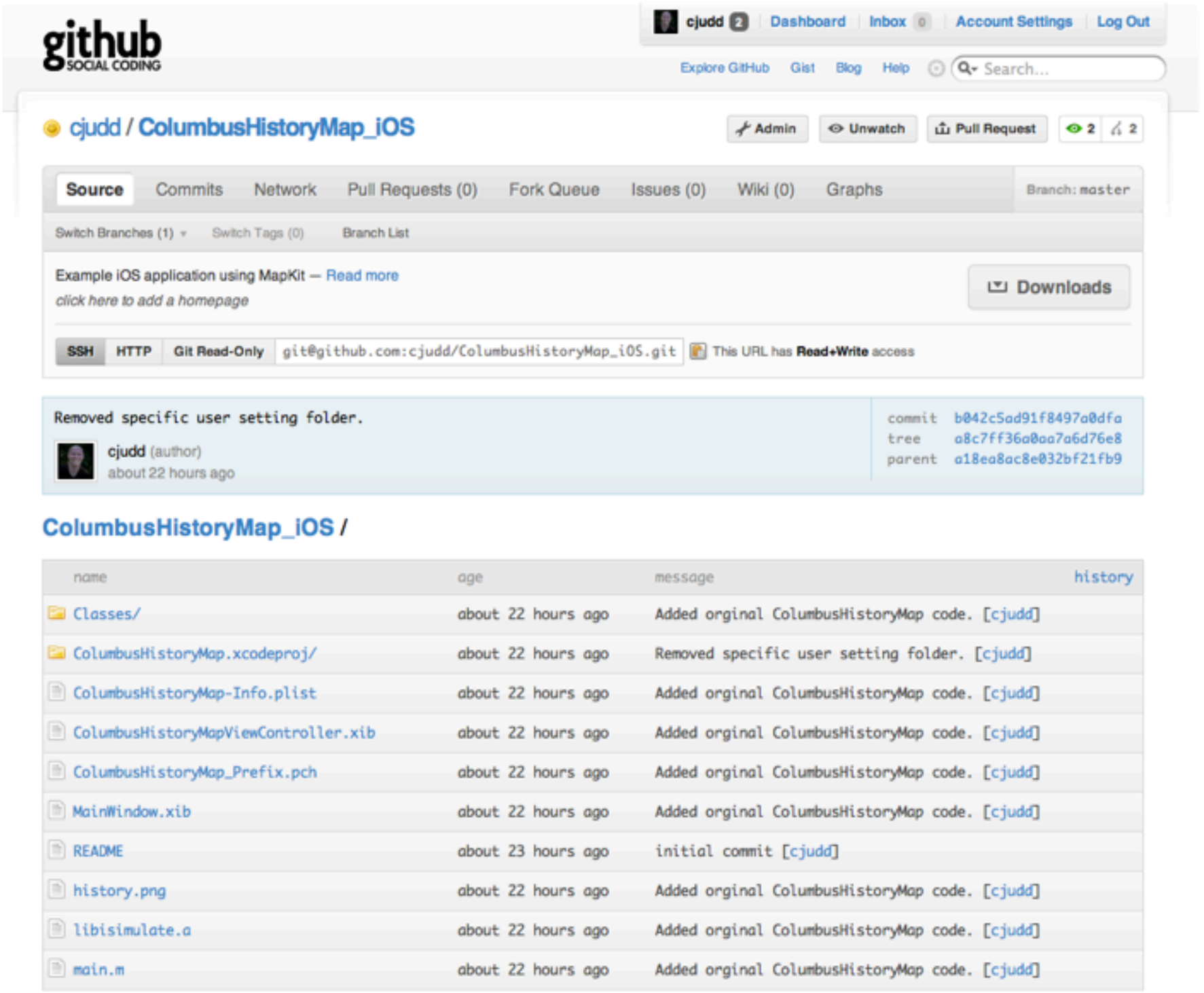
- licensing map data
- feature sets compared
- different packages have different capabilities
- overlays and dropping Pins
- using different gestures

Walter Tyree

Walter Tyree owns and runs Tyree Apps, LLC, an IT Consulting and iOS software shop located in Alexandria, VA. He took the indie plunge after about six years of teaching High School Computer Science and twelve years of life in corporate IT. He is active in the TapLynx community and has created a number of open source extensions for that framework and has worked behind the scenes on a number of iOS projects for clients. He has also created Massage Therapist Notebook, Carter's Coin Flip and Caroline's Cat Game in the app store.

View Details

Columbus History Map Source



https://github.com/cjudd/ColumbusHistoryMap_iOS

Christopher M. Judd

Judd Solutions

President/Consultant/Author

email: cjudd@juddsolutions.com

web: www.juddsolutions.com

blog: juddsolutions.blogspot.com

twitter: javajudd