Introduction to MapKit

Christopher M. Judd

Judd Solutions

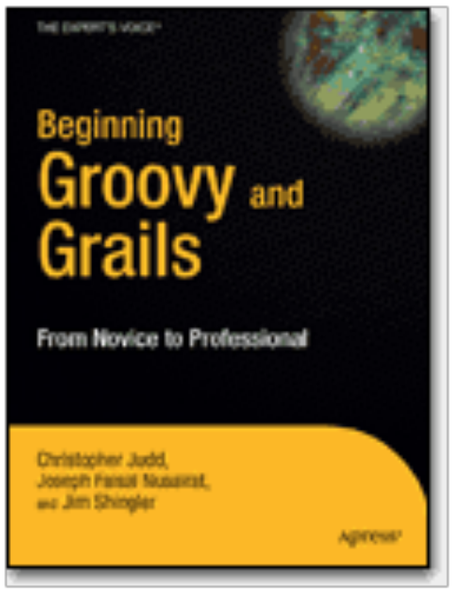
Christopher M. Judd

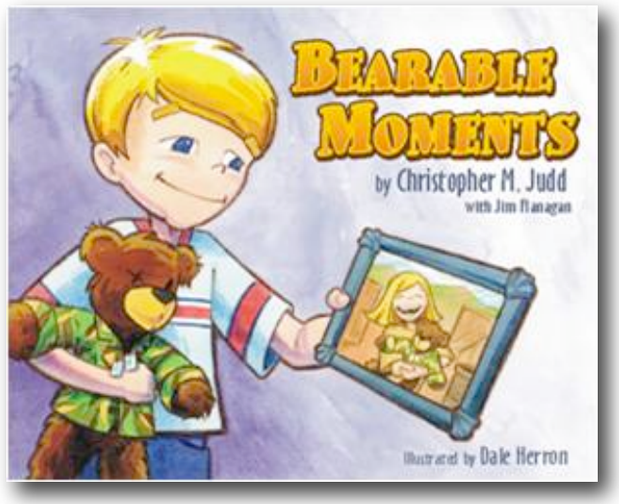
President/Consultant of **Judd Solutions**

Central Ohio Java Users Group leader

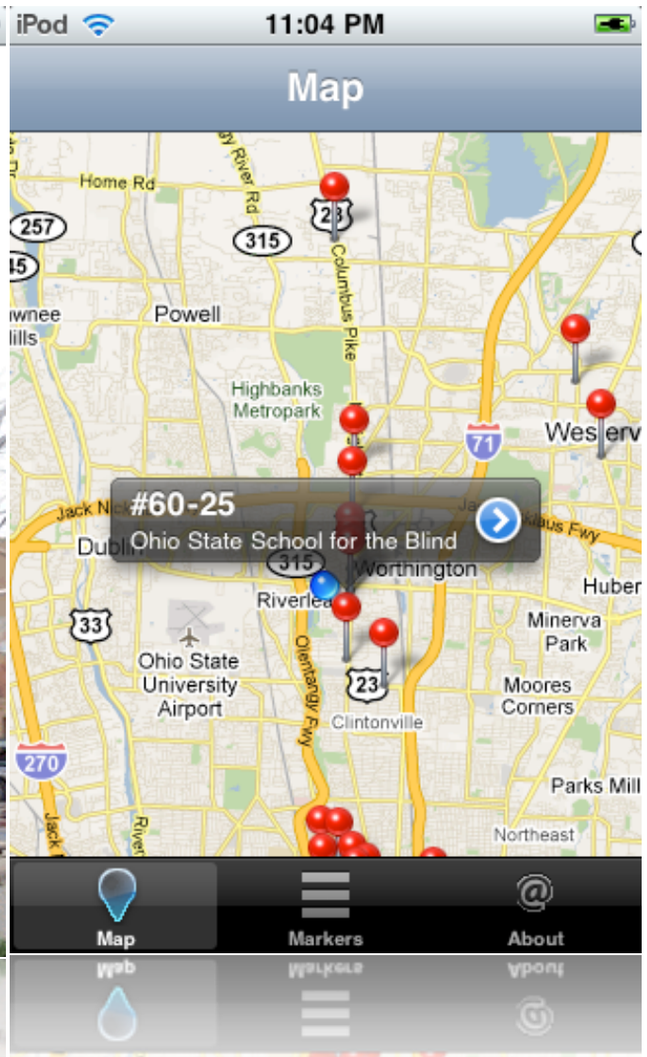
Columbus 

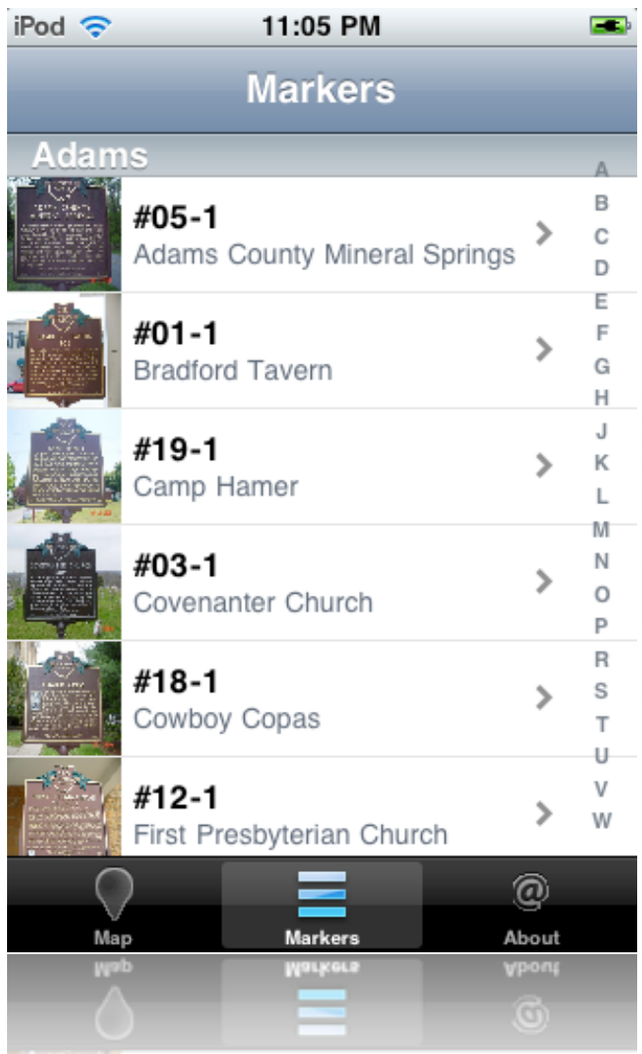
Developer User Group (CIDUG)





Remarkable Ohio

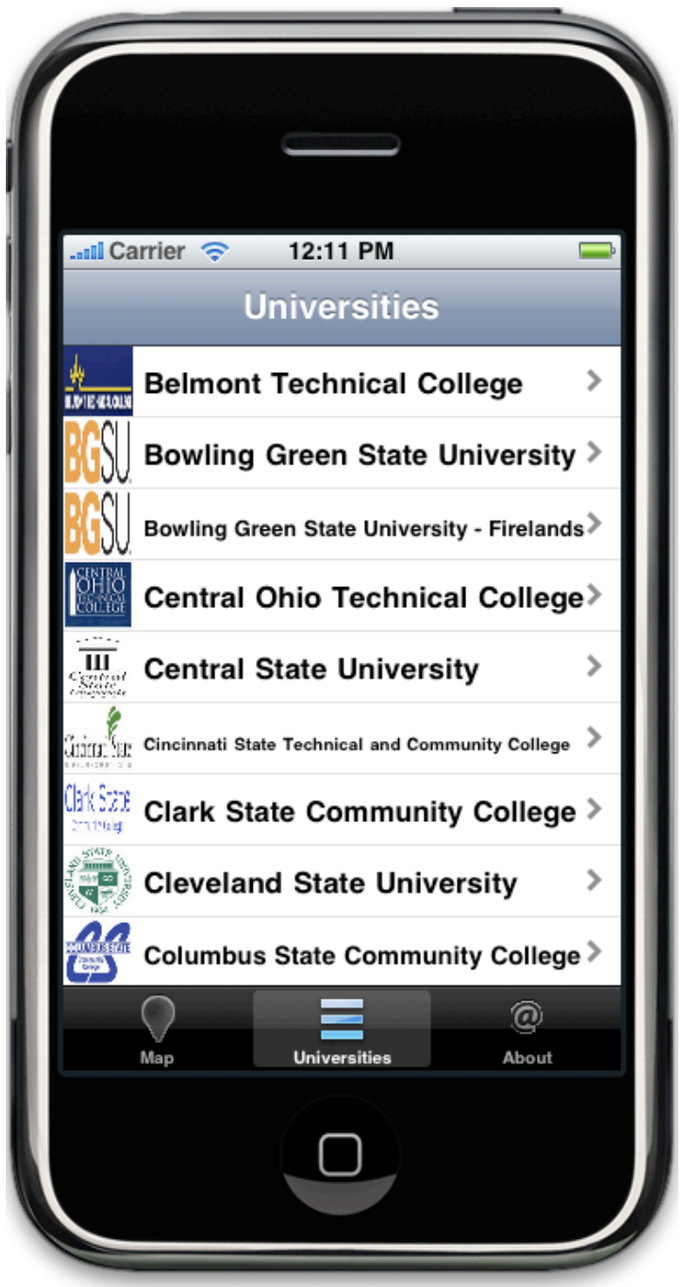


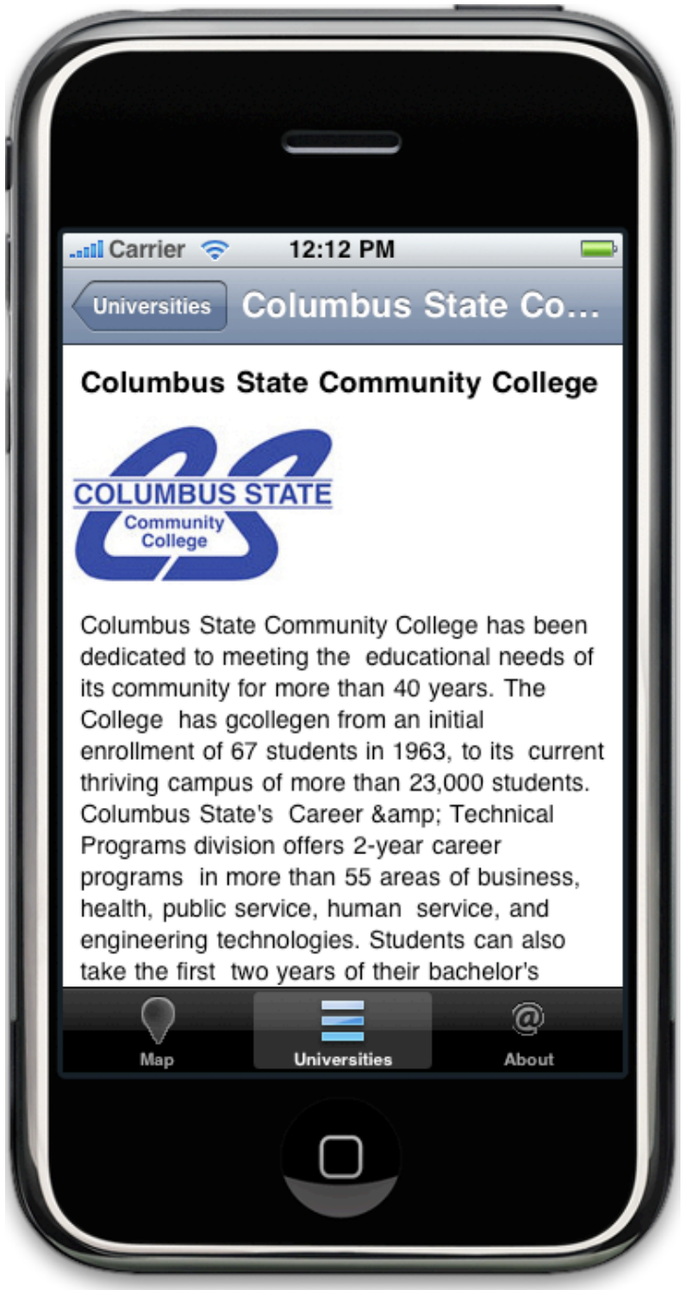


Free

Developed for eTech Ohio and Ohio Historical Center

University System Of Ohio





Free

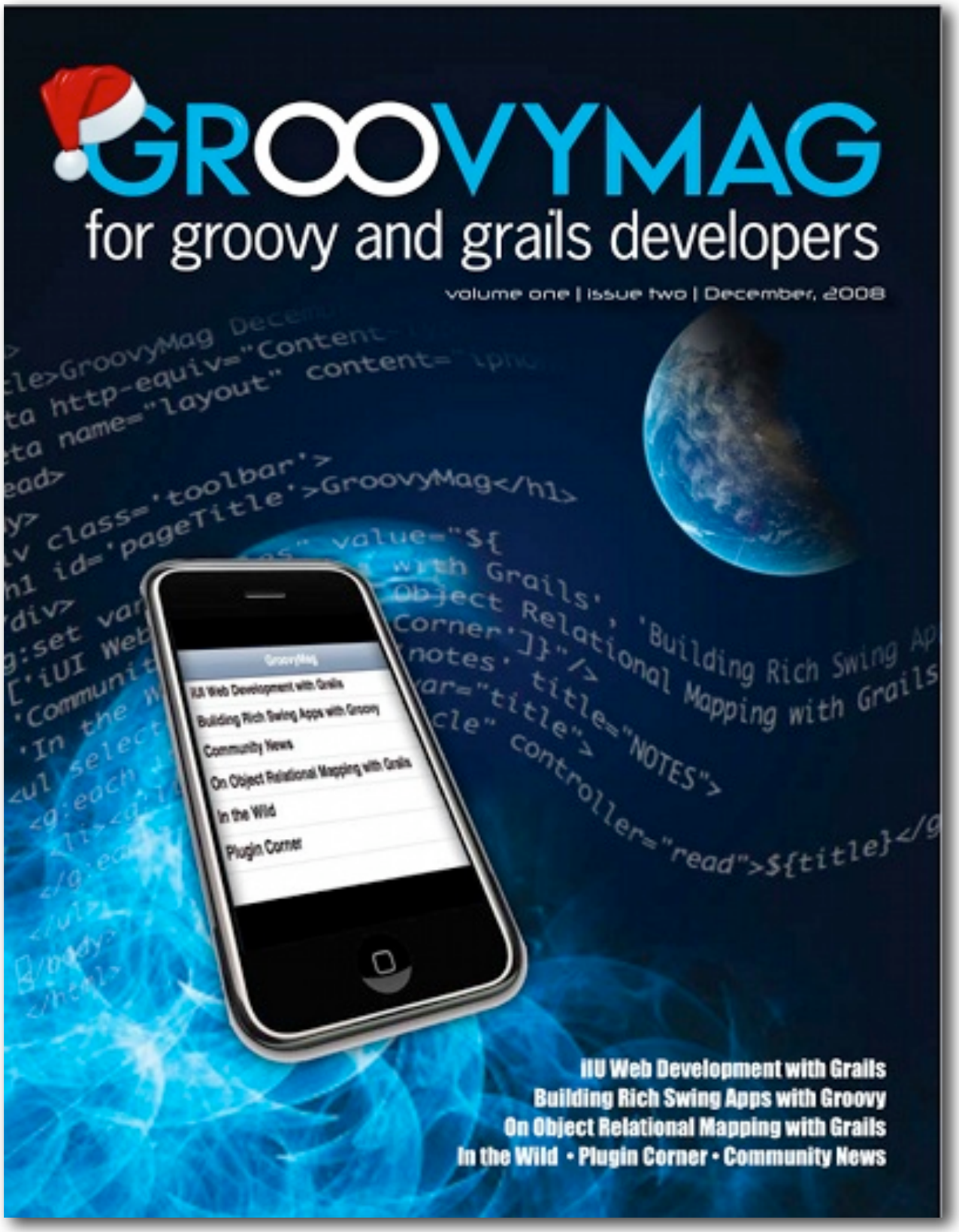
Developed for eTech Ohio and University System Of Ohio

Chmod

Free

Judd Solutions

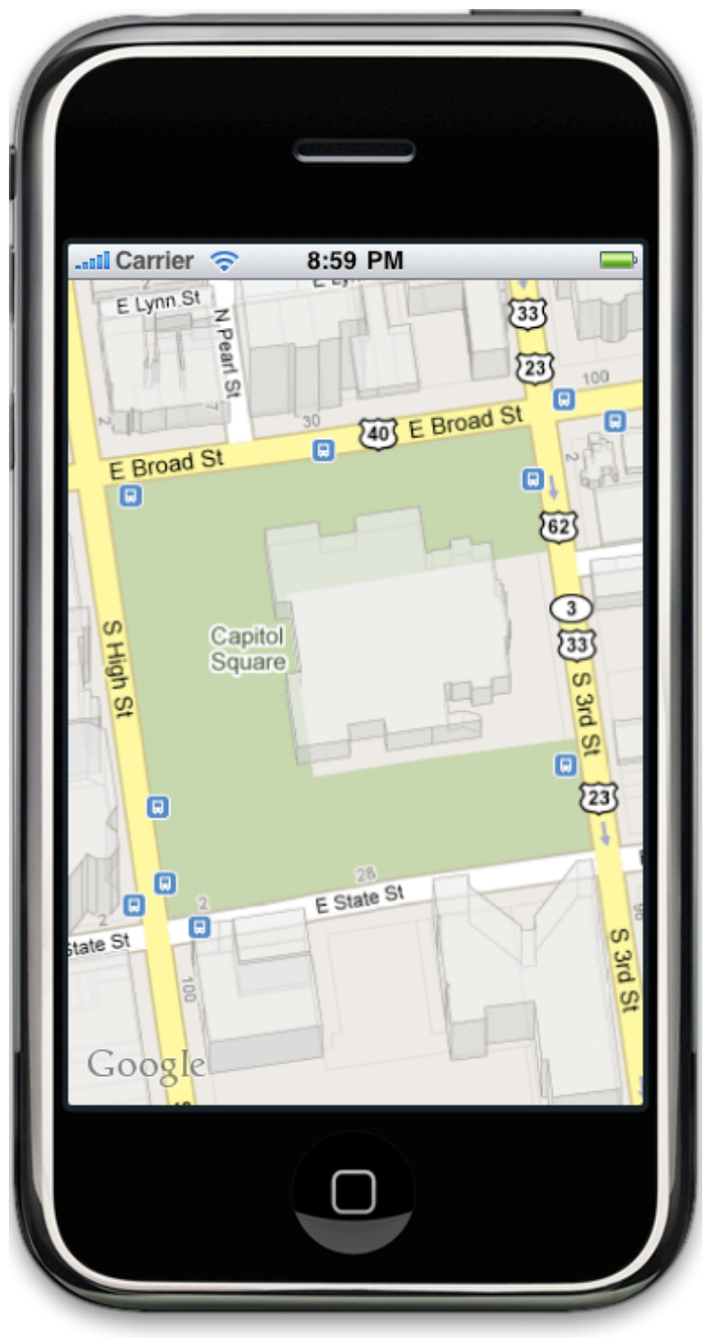
December 2008 issue



MapKit Basics

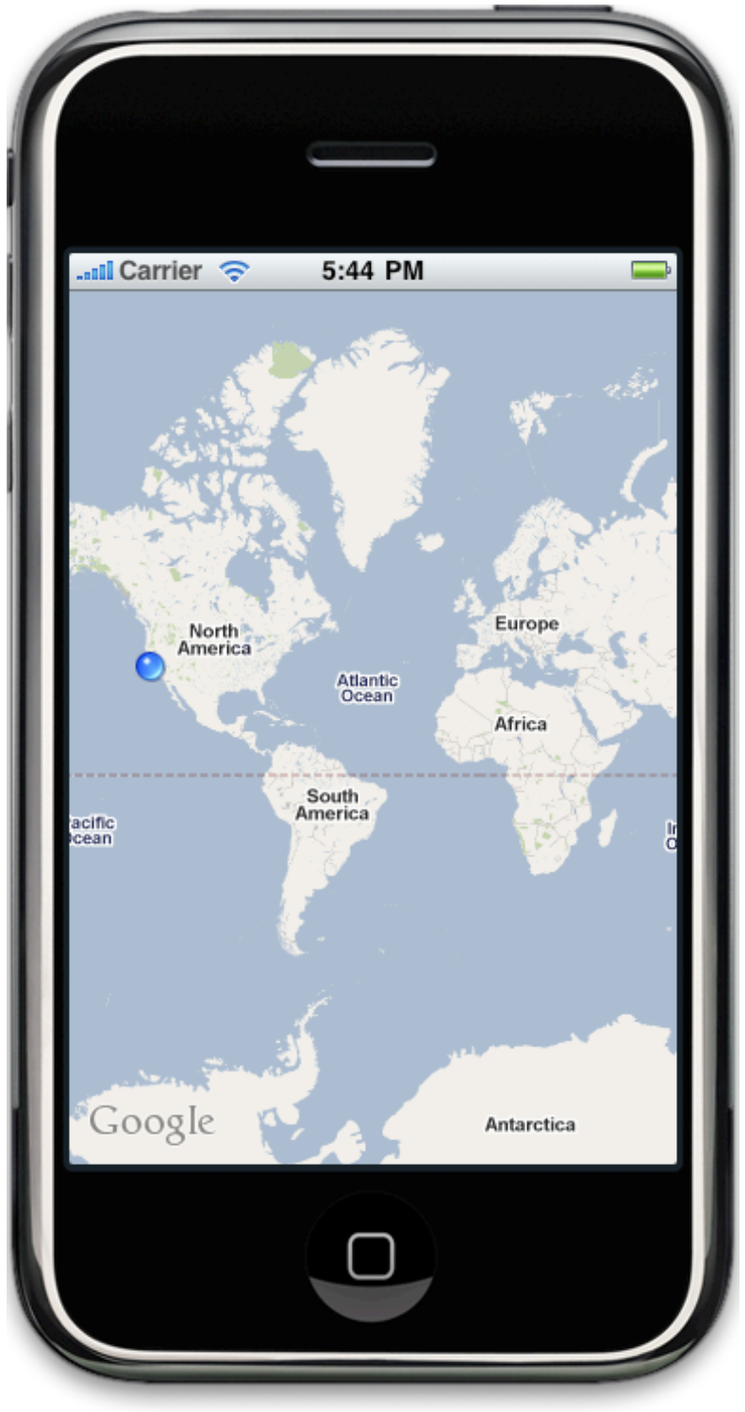
MapKit

MKMapView



Google maps

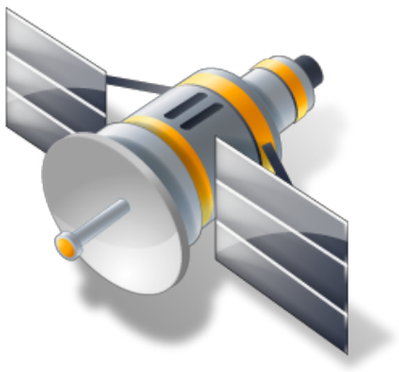
Current Location



1 kilometer

100 meters

SKYHOOK WIRELESS



10 meters

Core Location Framework

Map Types

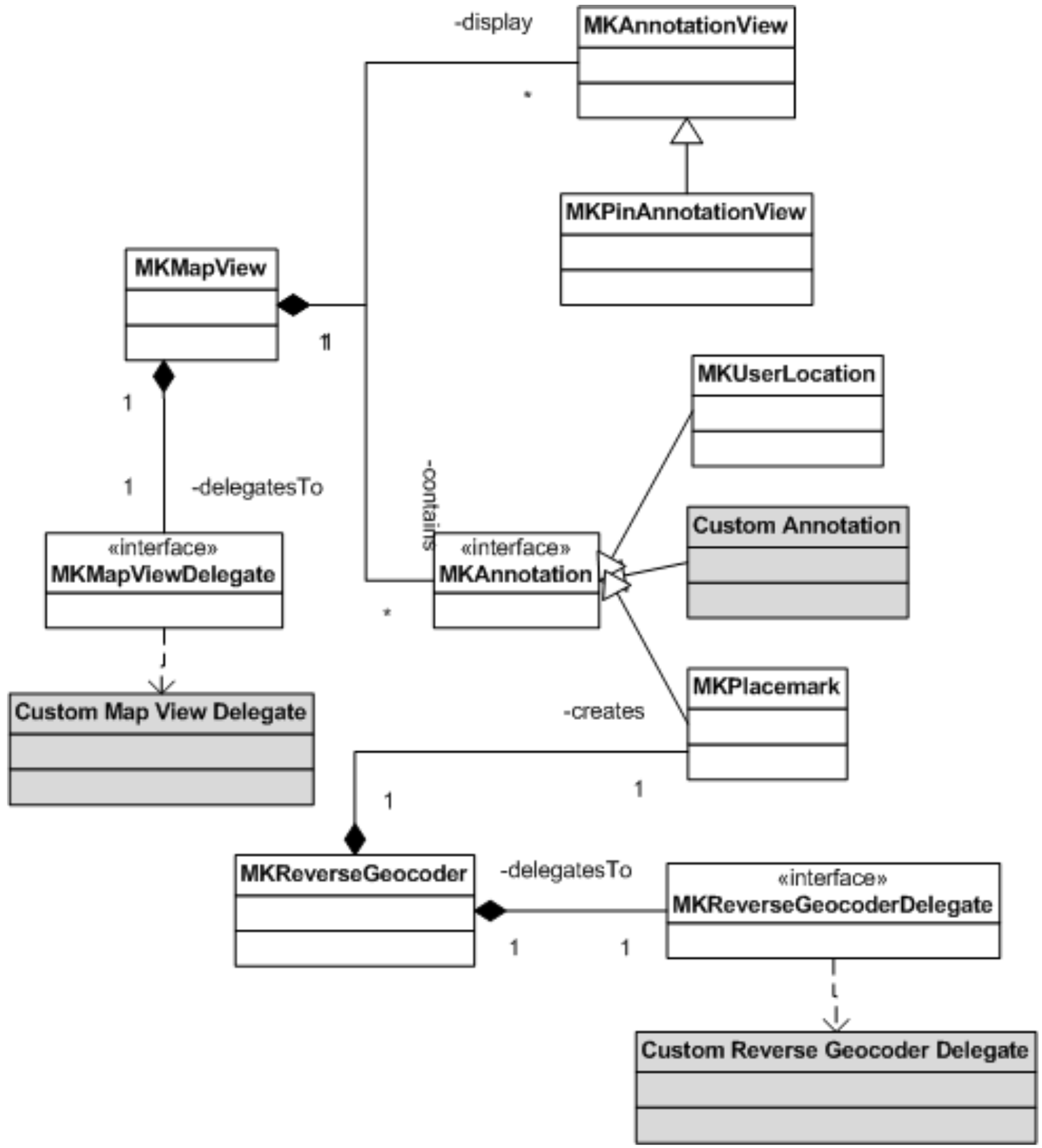
Standard

Satellite

Hybrid

Annotations

Classes and Protocols

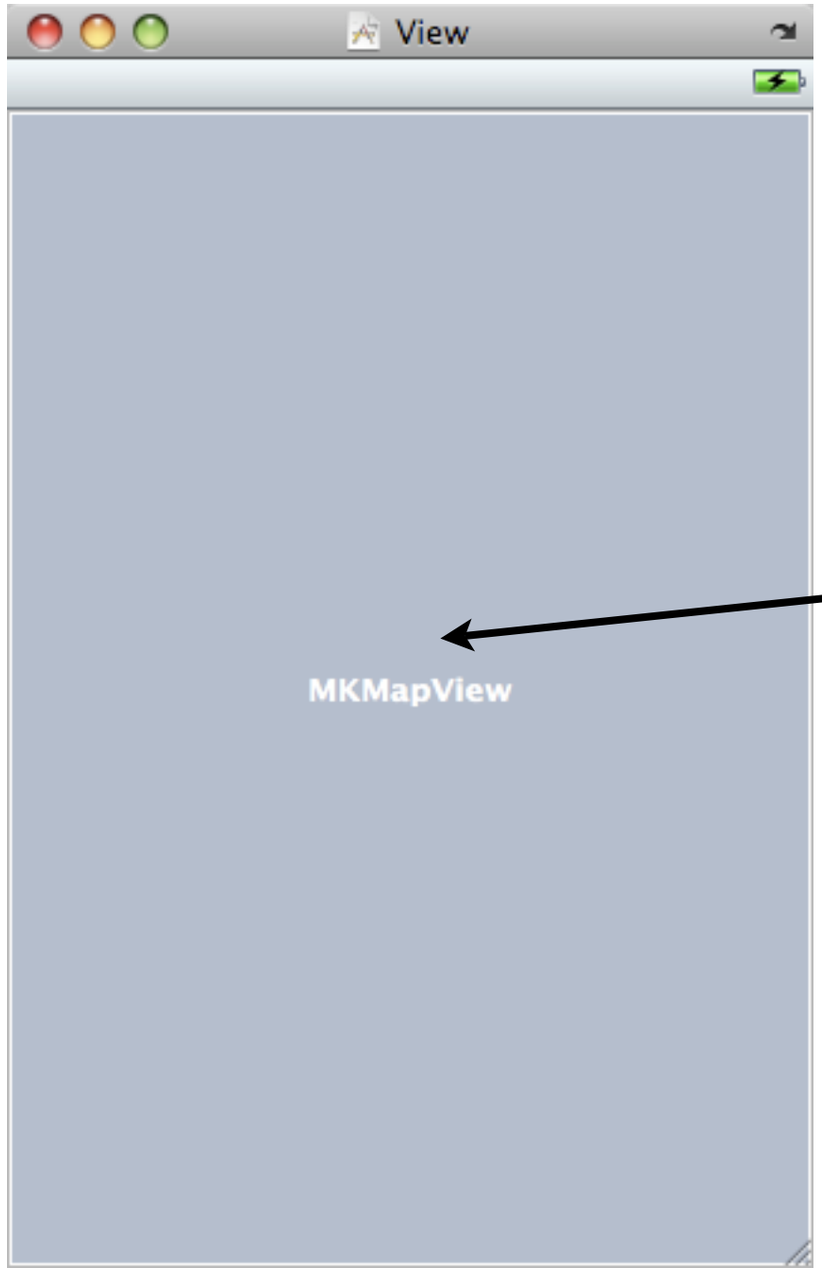


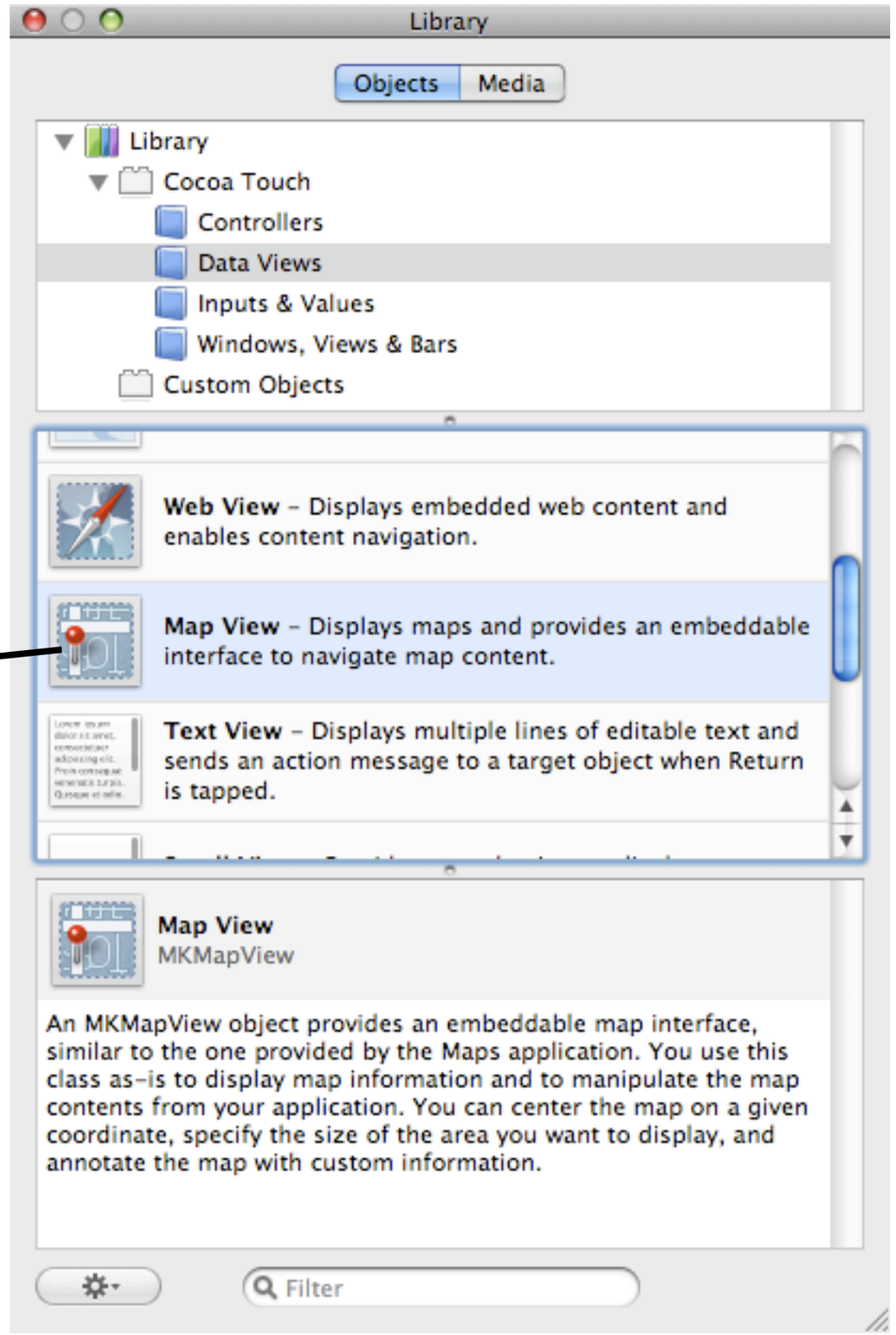
Adding Maps

Adding Maps Steps

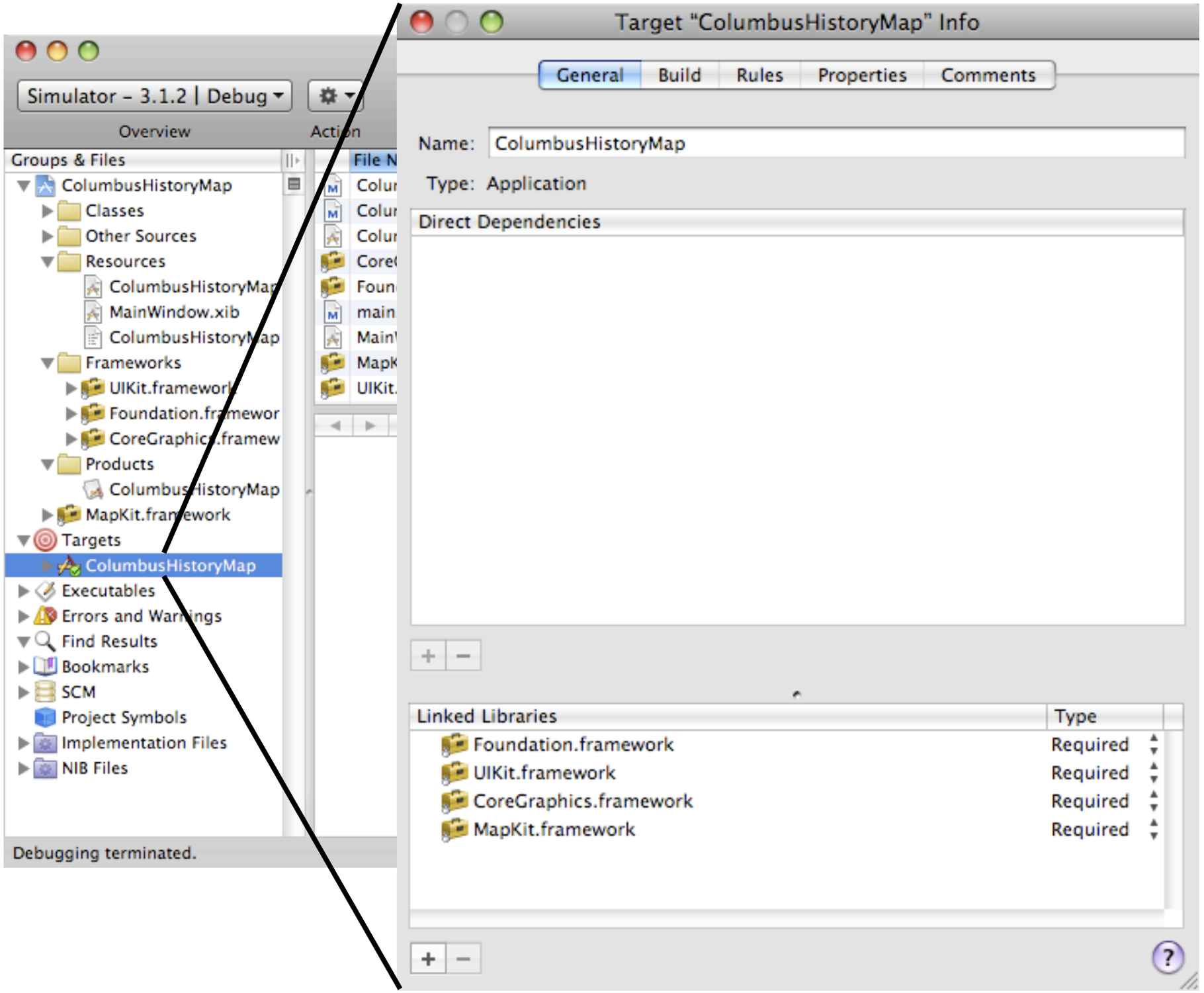
1. Add MapView component to view 
2. Add MapKit Framework to target libraries 
3. Run Application 

Add Map View Component





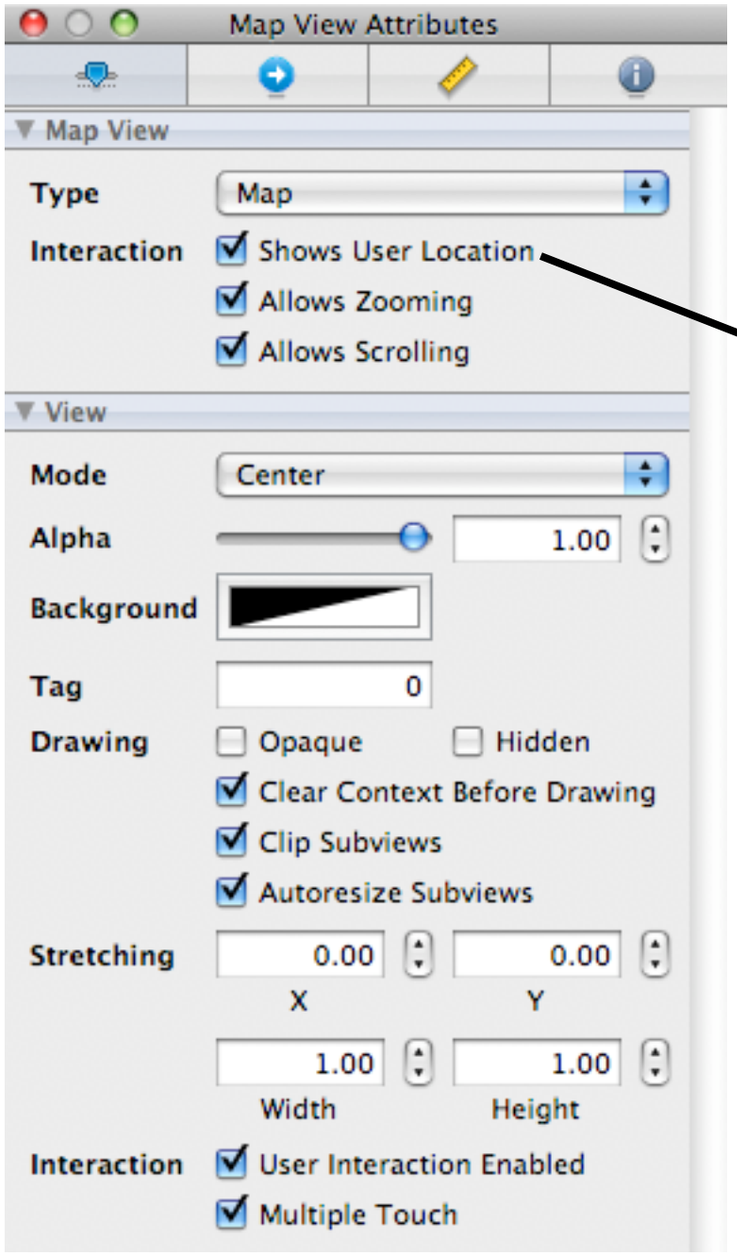
Add MapKit Framework

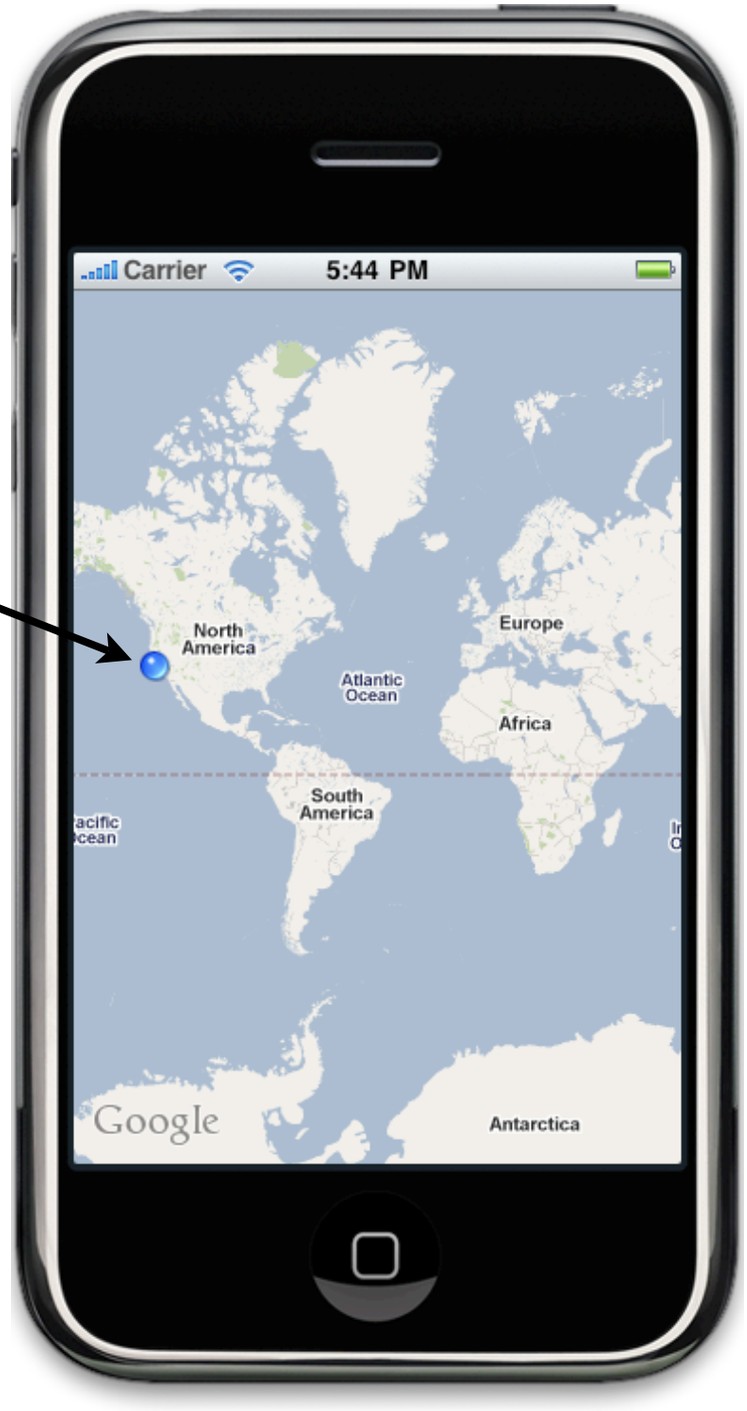


Run Application

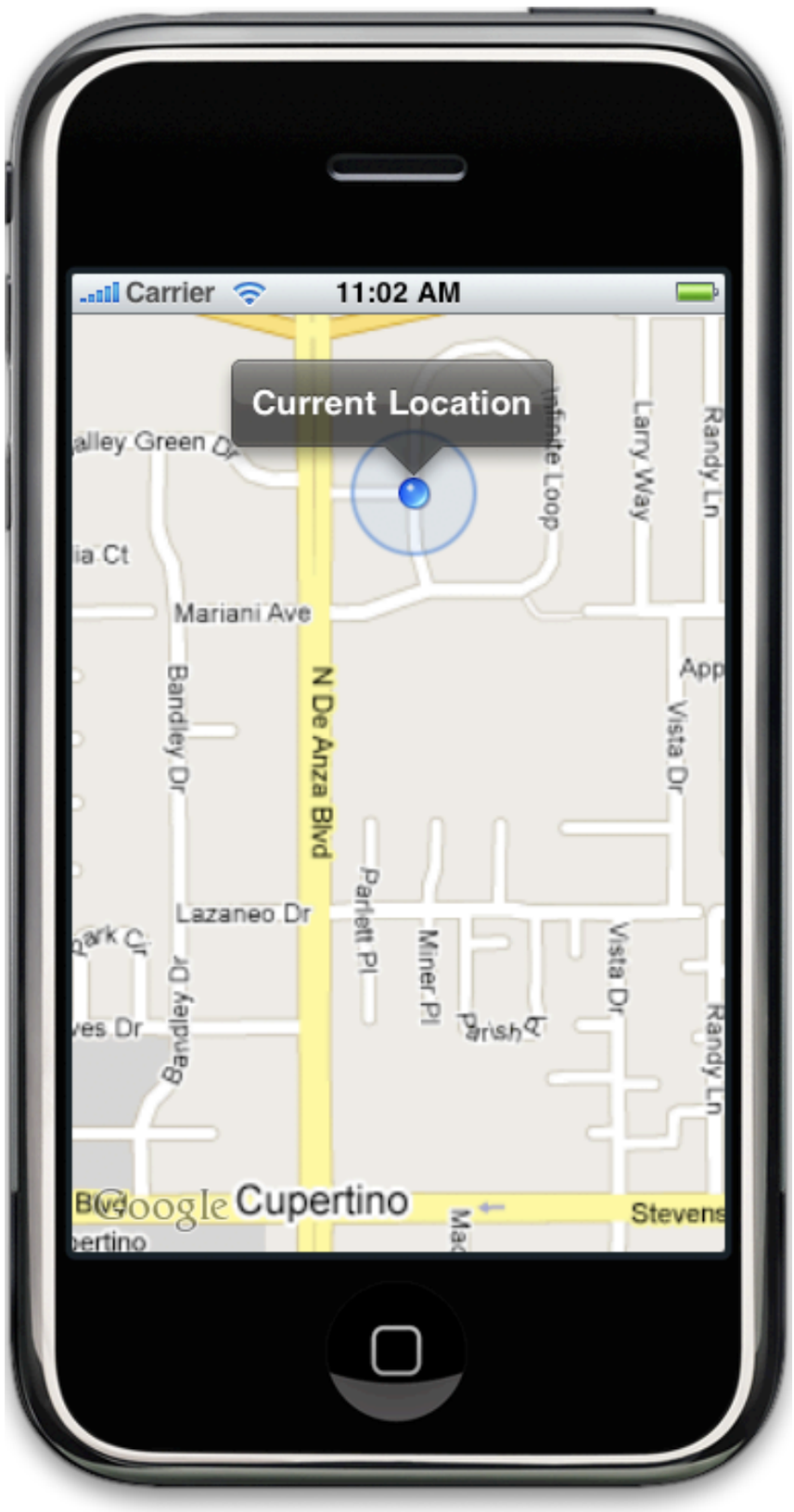
Display Current Location

Show User Location

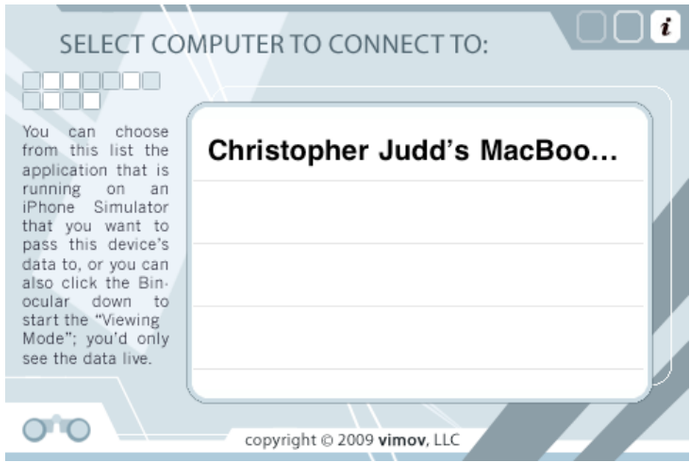


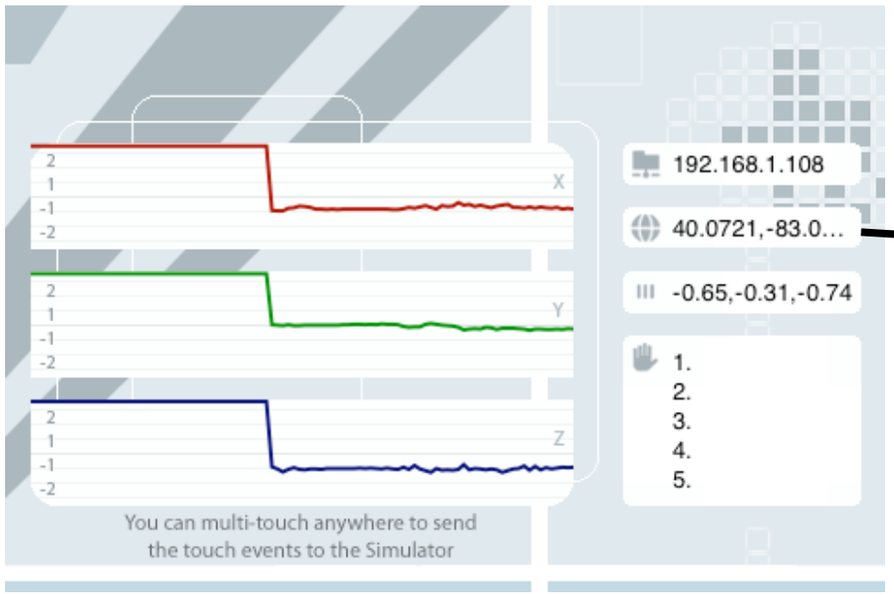


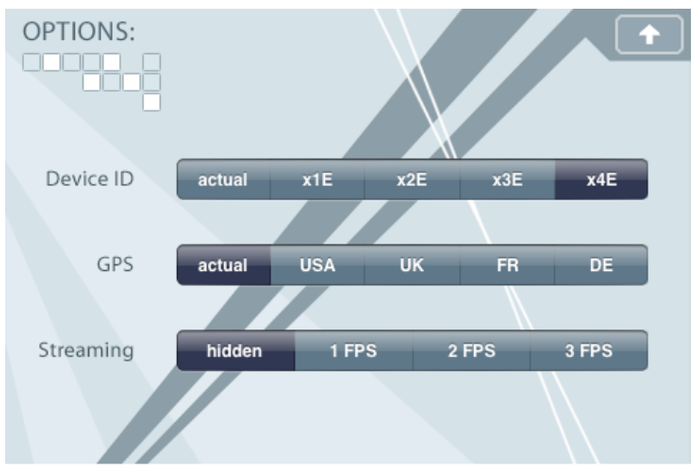
Simulator Location



iSimulate

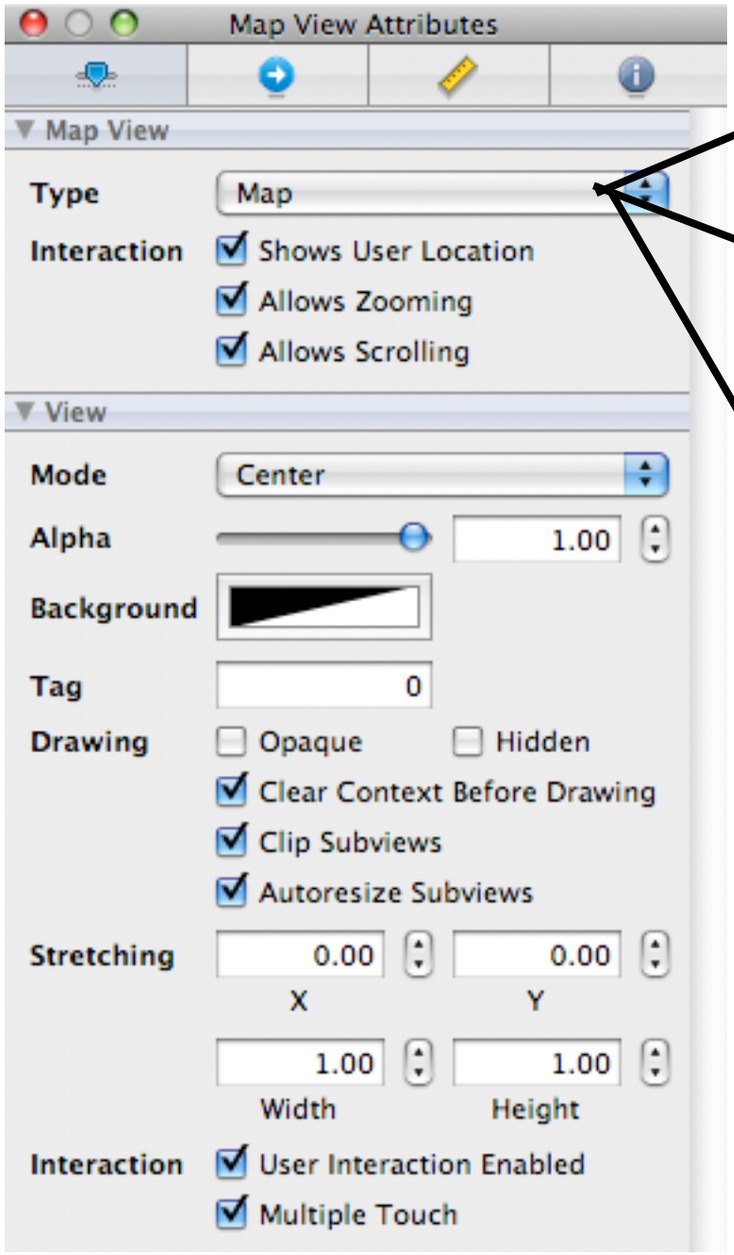






$9.99 in App Store

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

Basic Custom Annotation

HistoryMarker.h

Extend MKAnnotation

```
@interface HistoryMarker : NSObject <MKAnnotation> {
   CLLocationCoordinate2D _coordinate;
}
```

Implement required coordinate property

```
@property (nonatomic, readonly) CLLocationCoordinate2D coordinate;

- (id)initWithCoordinate:(CLLocationCoordinate2D)coordinate;

@end
```

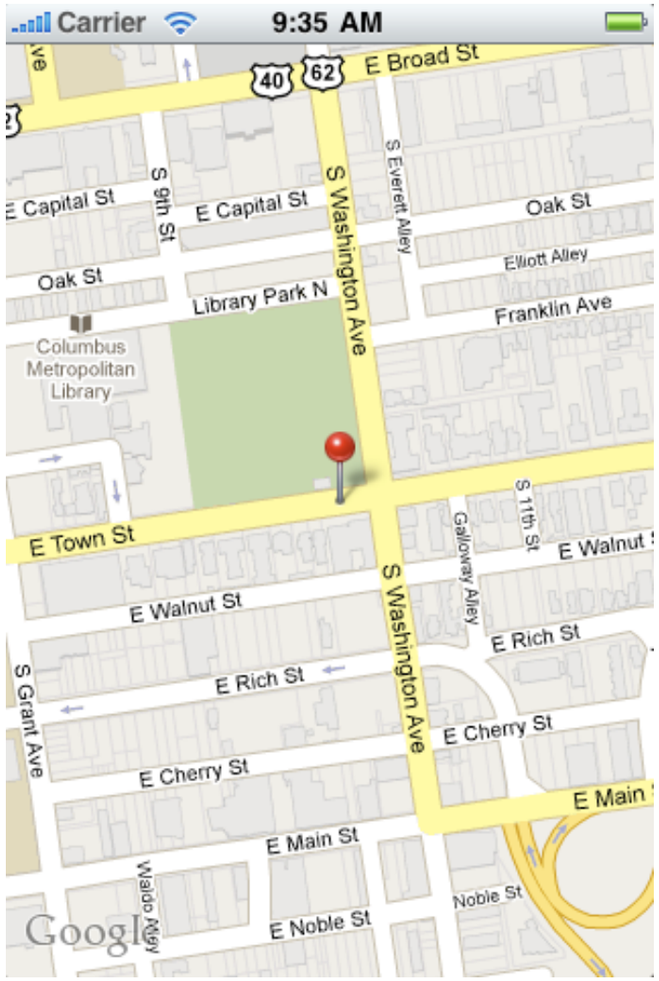
HistoryMarker.m

```
@implementation HistoryMarker

@synthesize coordinate = _coordinate;

- (id)initWithCoordinate:(CLLocationCoordinate2D)coordinate {
   if((self = [super init])) {
         _coordinate = coordinate;
   }
   return self;
}

@end
```

Add Annotation

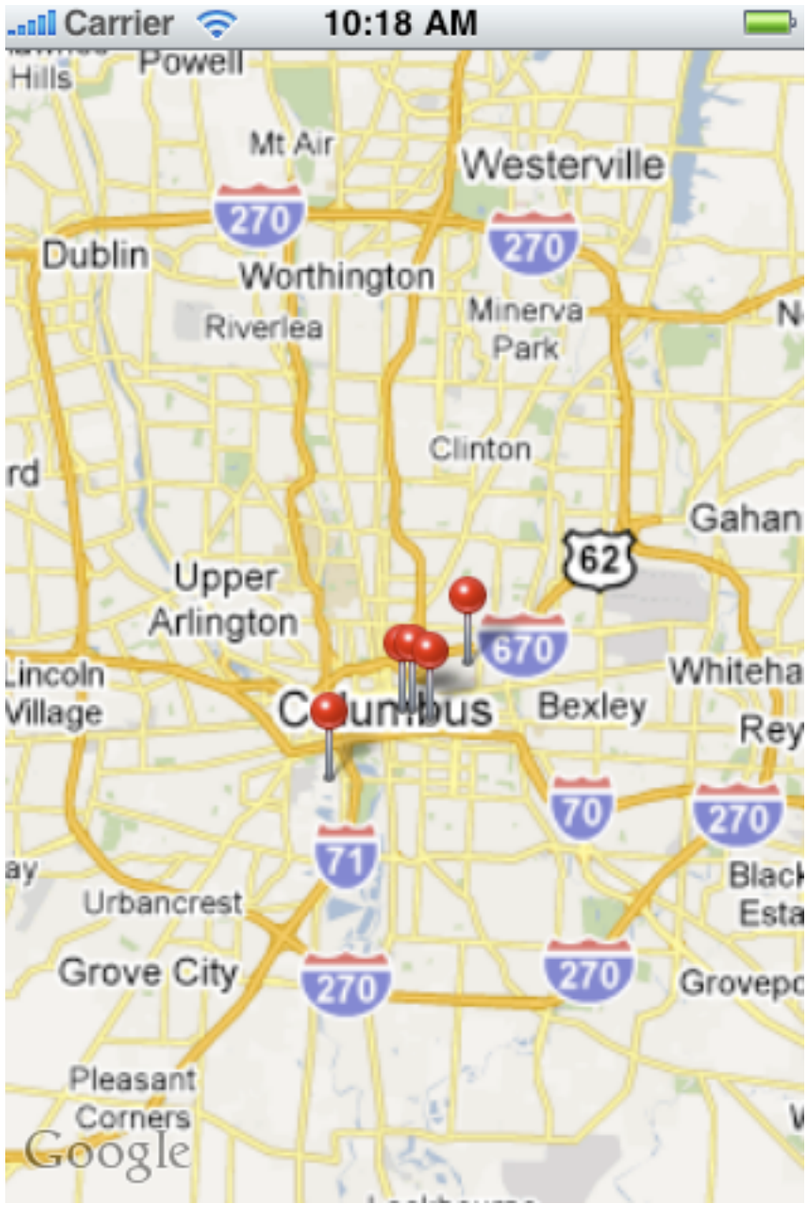
*Controller.m

```
- (void)viewDidLoad {
    [super viewDidLoad];

  CLLocationCoordinate2D coordinate = {39.960307, -82.98685};
  HistoryMarker* marker = [[HistoryMarker alloc] initWithCoordinate:coordinate];

  [_mapView addAnnotation:marker];
}
```



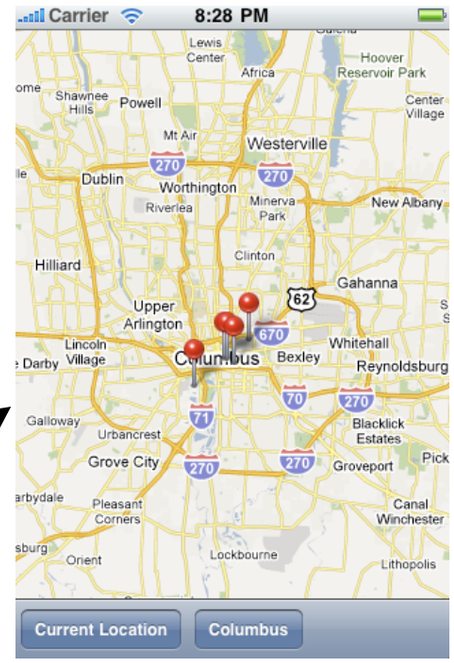
Positioning Map

Multiple Pins Can be hard to see from far away



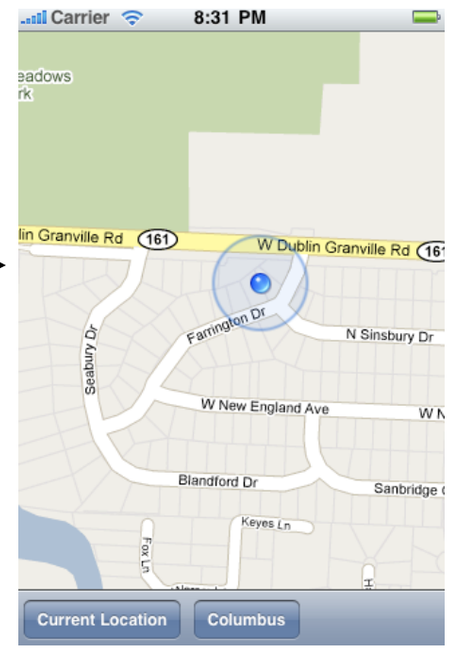
Applications with a geographical focus should frame the region

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];
}
```

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

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

}
```



Decorating Annotations

Changing Annotation Appearance

*Controller.h

Implement MKMapViewDelegate protocol

```
@interface ColumbusHistoryMapViewController : UIViewController <MKMapViewDelegate> {
   IBOutlet MKMapView* _mapView;
}

@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
```

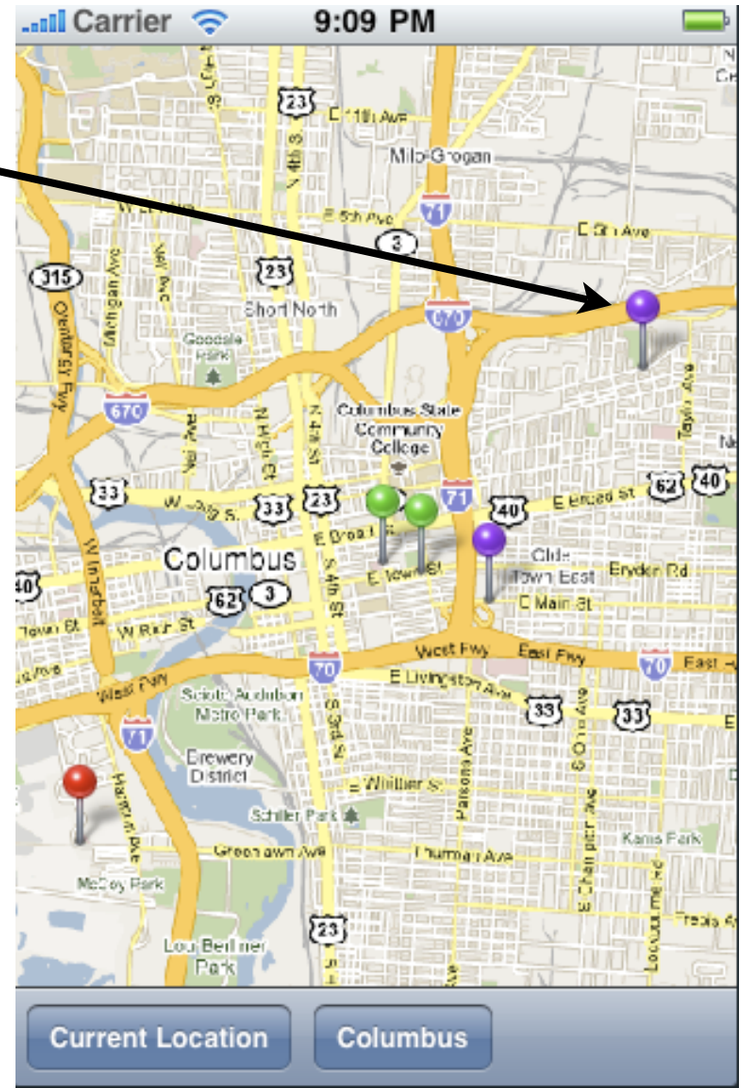
Assign delegate

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;
}
```

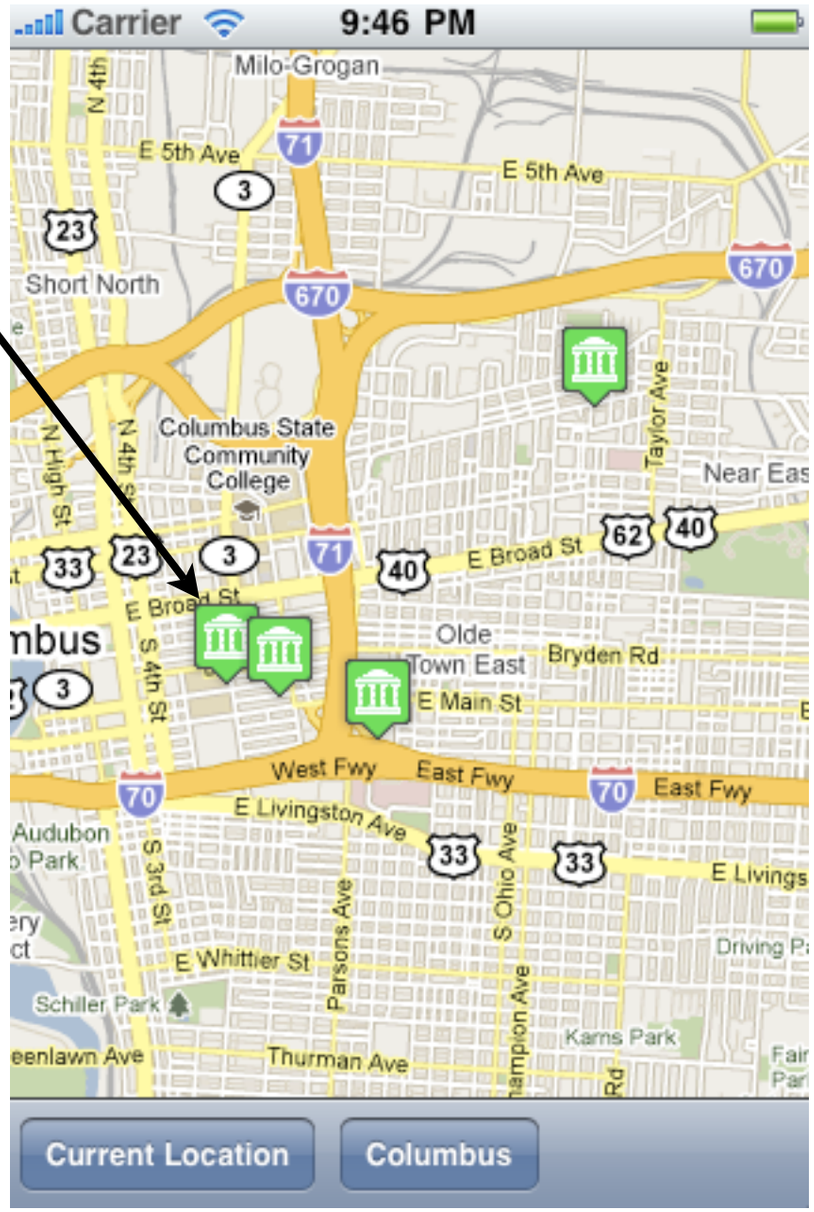


Limited to 3 colors

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

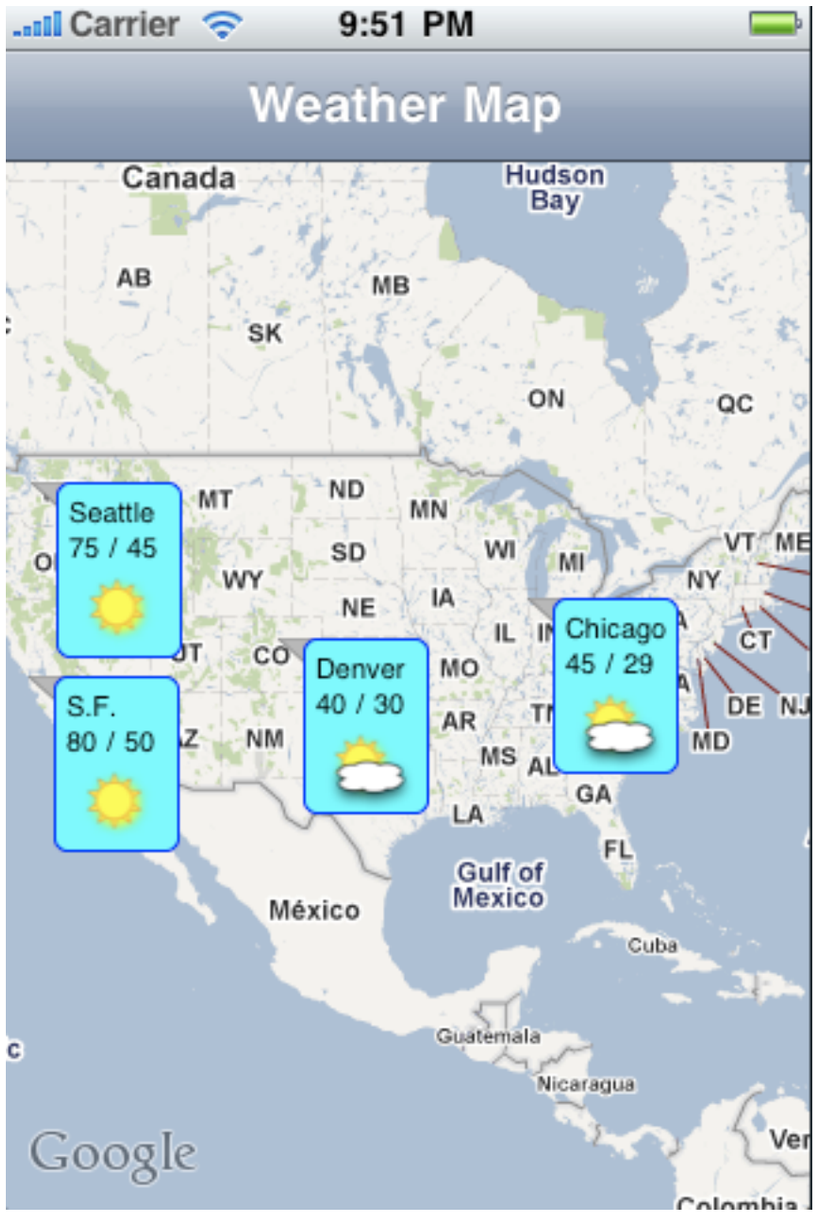
All the icons described and tagged.

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
CO
Denver
40 / 30
MO
AR
MS
AL
GA
DE
NJ
MD
NM
LA
FL
S.F.
80 / 50
Gulf of Mexico
México
Cuba
Guatemala
Nicaragua
Google


AT&T
9:53 PM
Toledo
Findlay
Lima
Springfield
Dayton
Cincinnati
Mansfield
Zanesville
Parkersburg
Mayville
Portsmouth
Ashland
Teays Valley
Huntington
Charleston
West Virginia
Lexington-Fayette
Morehead
Richmond
Beckley
Google

Be Creative

Callouts

Enable Callouts

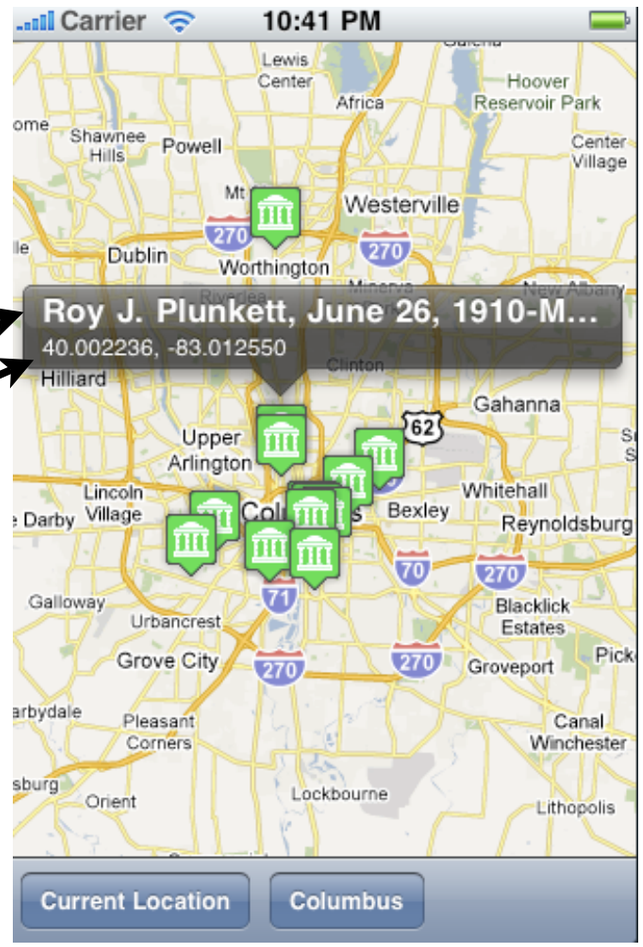
```
- (MKAnnotationView *)mapView:(MKMapView *)mapView viewForAnnotation:(id <MKAnnotation>)annotation {
   if(annotation == mapView.userLocation) { return nil; }

   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
```



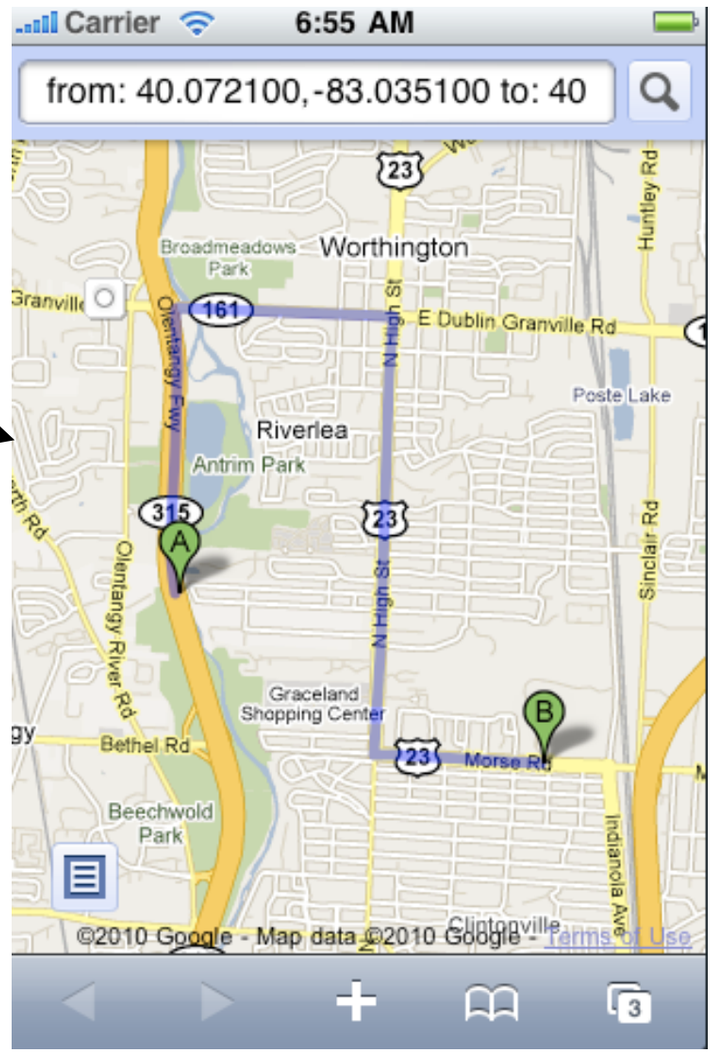
Add Behavior to Callouts

```
- (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...

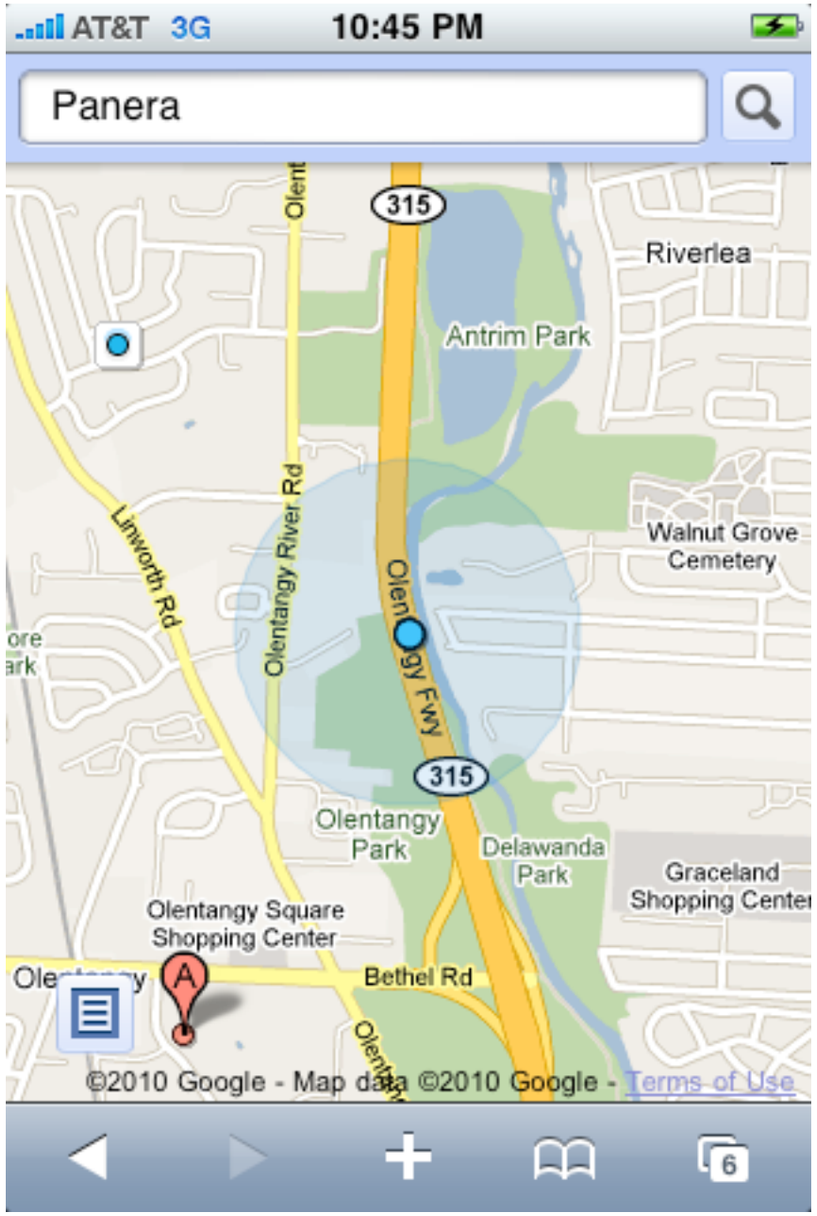
Includes:

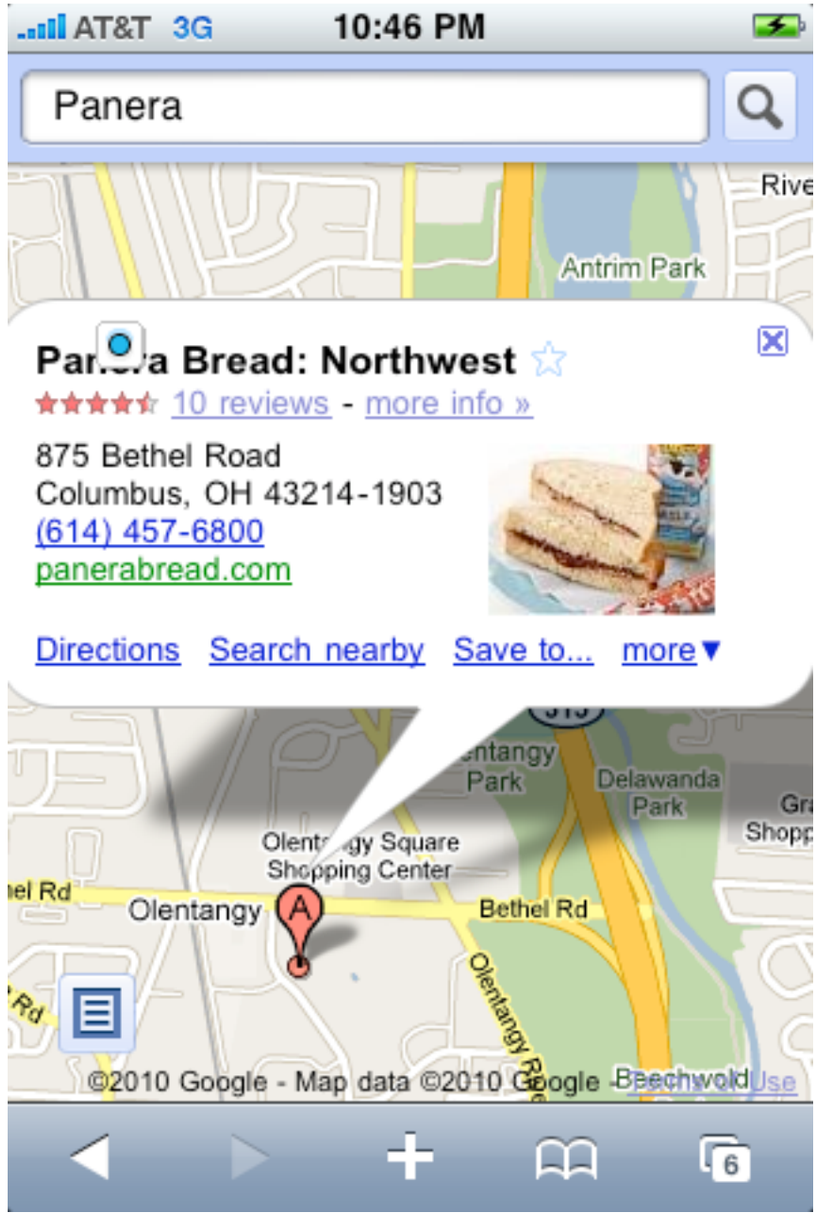
- Native support
- Sponsored Points of Interest and more...

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

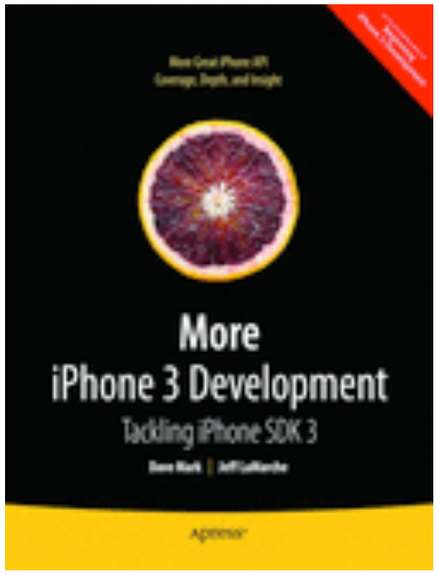
http://developers.cloudmade.com/projects/show/iphone-api

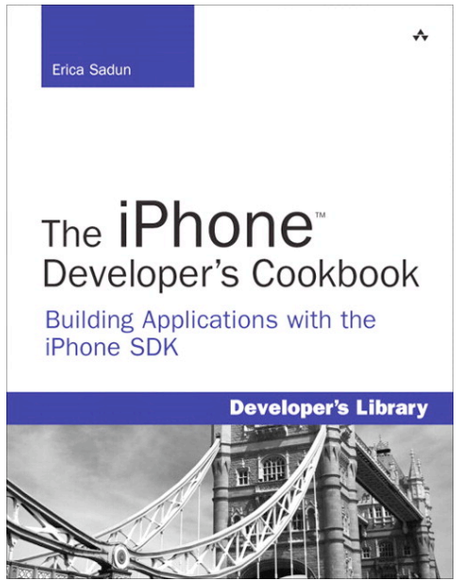
Google maps

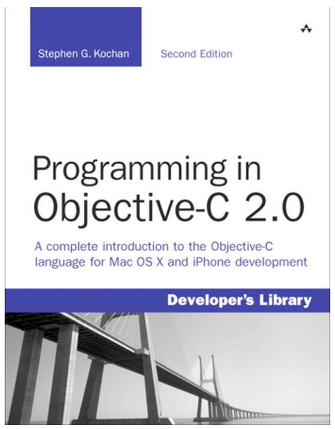

AT&T 3G
10:45 PM
Panera
315
Riverlea
Antrim Park
Olentangy River Rd
Linworth Rd
Olentangy Fwy
Walnut Grove Cemetery
Olentangy Park
Delawanda Park
Graceland Shopping Center
Olentangy Square Shopping Center
Bethel Rd
©2010 Google - Map data ©2010 Google - Terms of Use

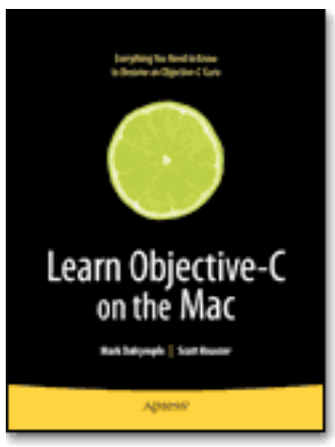

AT&T 3G
10:46 PM
Panera
Antrim Park
Bread: Northwest
10 reviews - more info »
875 Bethel Road
Columbus, OH 43214-1903
(614) 457-6800
panerabread.com
Directions
Search nearby
Save to...
more
Delawanda Park
Olentangy Square Shopping Center
Olentangy
Bethel Rd
©2010 Google - Map data ©2010 Google - Beechwold

Resources









The Objective-C Programming Language

Christopher M. Judd

Judd Solutions

President/Consultant/Author

email: cjudd@juddsolutions.com

web: www.juddsolutions.com

blog: juddsolutions.blogspot.com

twitter: javajudd