

# Johns Hopkins Engineering

## **Location Services and Frameworks**

Module 4



JOHNS HOPKINS

WHITING SCHOOL  
*of* ENGINEERING

---

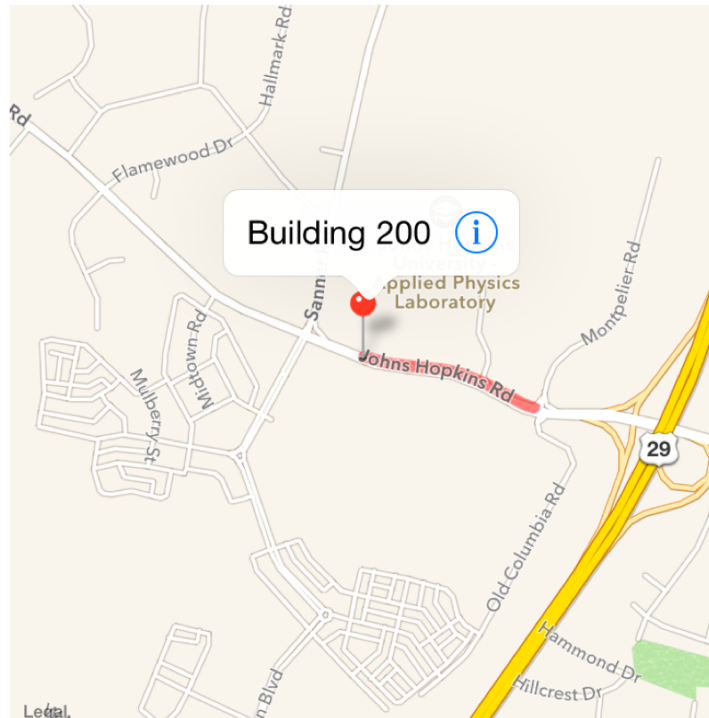
## MapKit

The material in this video is subject to the copyright of the owners of the material and is being provided for educational purposes under rules of fair use for registered students in this course only. No additional copies of the copyrighted work may be made or distributed.

# MapKit

MapKit is the framework in iOS that allows you render maps in a view. In addition to maps, you can display:

- Satellite imagery
- Points of interest
- Placemark information
- Transportation paths



# MKMapView

- Provides an embeddable map similar to the one provided by the Maps application
- You can use this class to display and manipulate a map:
  - Center on a coordinate
  - Specify the size of the area to display
  - Annotate the map
  - The region to view (via the map's region property)
- You also get scrolling and zooming for free (these can be disabled)

# MKMapViewDelegate

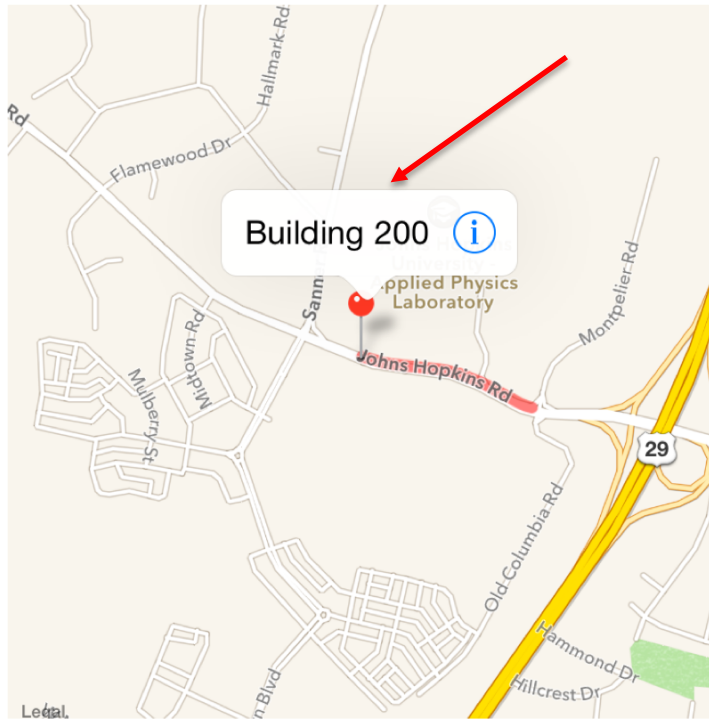
- Like other UI classes, MapView uses a delegate, of type MKMapViewDelegate, to handle work on its behalf. The delegate can:
  - Respond to map position changes
  - Loading map data
  - Tracking user location
  - Managing Annotations
  - Managing Overlays

# MKMapItem

- Includes a geographic location and any interesting data for that location (e.g. an address)
- A special MKMapItem represents the user's current location
- The class method `openMaps(with:launchOptions:)` can be used to launch Maps, prepopulated with an array of MKMapItems

# Adding Annotations

- You can annotate specific map coordinates (e.g. your favorite restaurant) with an `MKAnnotationView`
- Annotations can contain an image, a label, and a disclosure button, which can be used to show more details
- Annotations are dequeued like `UITableViewCell`s to better manage memory usage



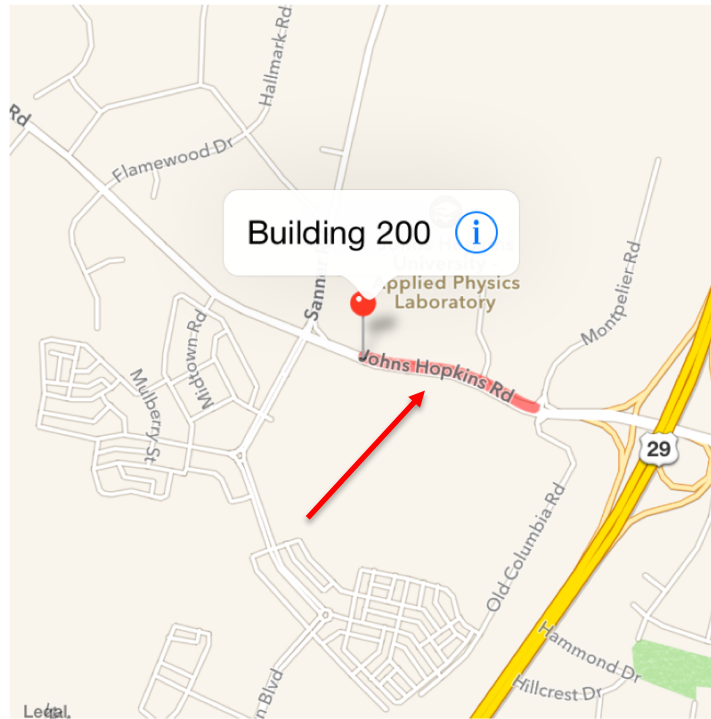
# Getting Directions

- You have access to Apple's directions API to generate routes between MKMapItems
- MKDirectionsRequest allows you to configure the parameters for such a request – the transportation type, the start and end points, and whether to request alternate routes
- MKDirections then takes that request, and upon calling `calculateDirectionsWithCompletionHandler`, you get an array of routes you can add as overlays to your map



# Rendering Overlay Paths

- You can take an overlay object (e.g. from a directions request) and render it with the MKMapView's `add(_, level:)` method
- You can define the level at which you want to render the overlay (aboveRoads or aboveLabel)



# Map Snapshots

- You can ask MapKit to take a snapshot of the current MKMapView if you wish to use it elsewhere (e.g. a thumbnail)
- MKMapSnapshotter generates an MKMapSnapshot based on the options specified in MKMapSnapshotOptions
- Note: overlays or annotations are NOT captured in a snapshot!



JOHNS HOPKINS

WHITING SCHOOL  
*of* ENGINEERING