

Interactive CSUB Multi-Level Campus Navigation



Team Rocket

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First Term Objectives

Functioning Outdoor Navigation

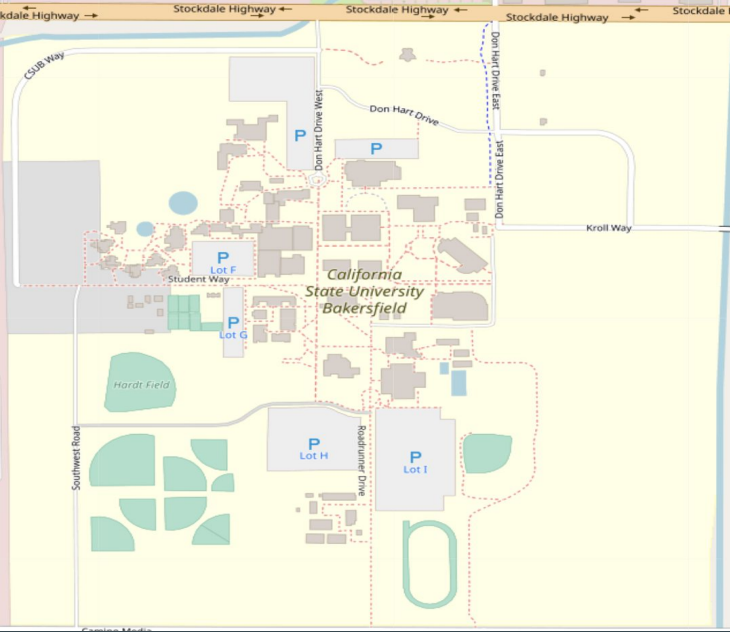
- Information/Permission Gathering
- Obtaining floor plans
- Gathering required permissions and licenses
- Familiarizing ourselves with languages and software

ArcGIS

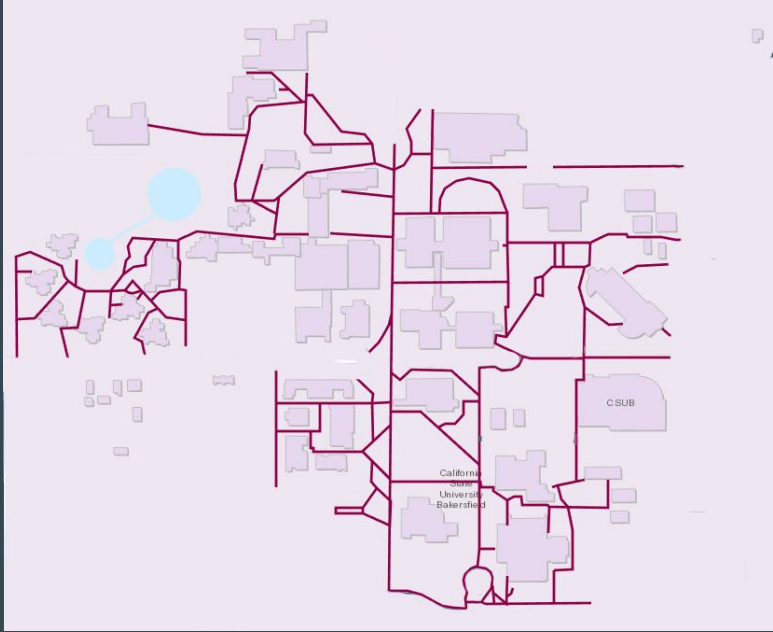
- ArcGis
 - A platform to create and manage spatial data
 - Build custom maps
 - Analyze map data
 - Calculate Distances
 - Navigations
- Outdoor Mapping
 - Mapping out the Campus
 - Entrances/Walkways/Paths
 - Pathing
 - Lines/Routes
 - Optimal Pathing
 - Tracking ETA
- Complications
 - Using Map Data to design navigation
 - Determining best method to calculate ETA

Map Layouts

2D Overview of CSUB



CSUB Walkways



Programming Application and Languages

- **Android Studio**

- Basic platform to create the mobile app
- Front-end Application
- Location Manager library
- Implement Map data, floor plans, navigation, and other features

- **Programming Languages**

- Java for mobile application
 - Middleware software creation
- JavaScript for web application

- **Complications**

- Familiarize with Android Studio
- Familiarize with Java and JavaScript
 - Understand the use of the Leaflet library for JavaScript
- Connecting map data from ArcGIS

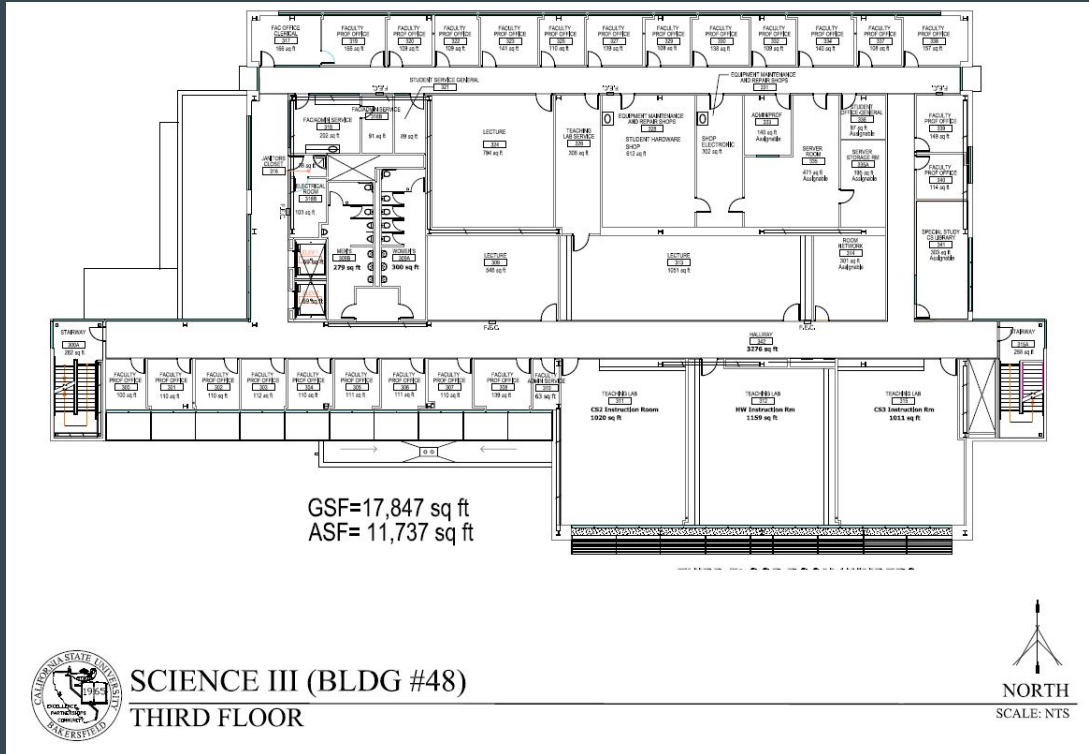
Second Term Objectives

- Indoor Mapping
- Directory
- Gather locations of classes and offices
- Implement additional features

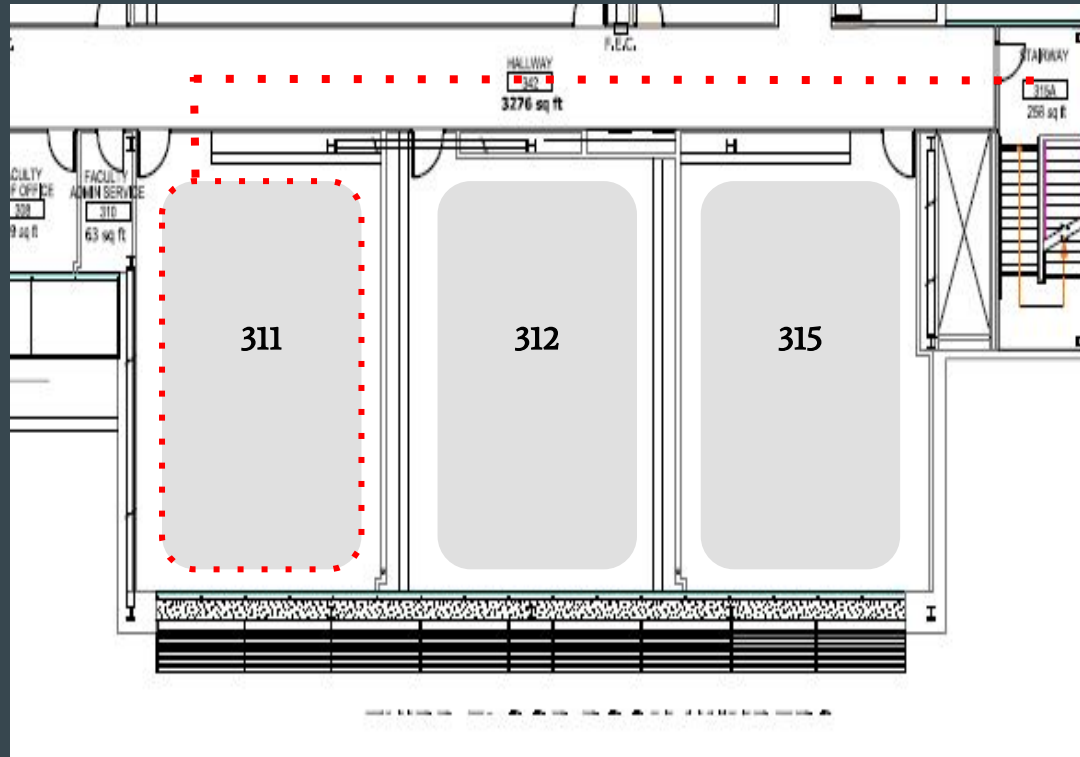
Indoor Navigation

- Indoor mapping
 - Floor plans
 - Entrances, exits, classrooms, elevators, stairs, bathrooms, walls.
- Room Directory
 - CSV file with relevant information
- Layering model
 - Stacking floor plans
- Complications
- Transitioning between indoor and outdoor navigation
- Supplement our old floor plans

Floor Plans



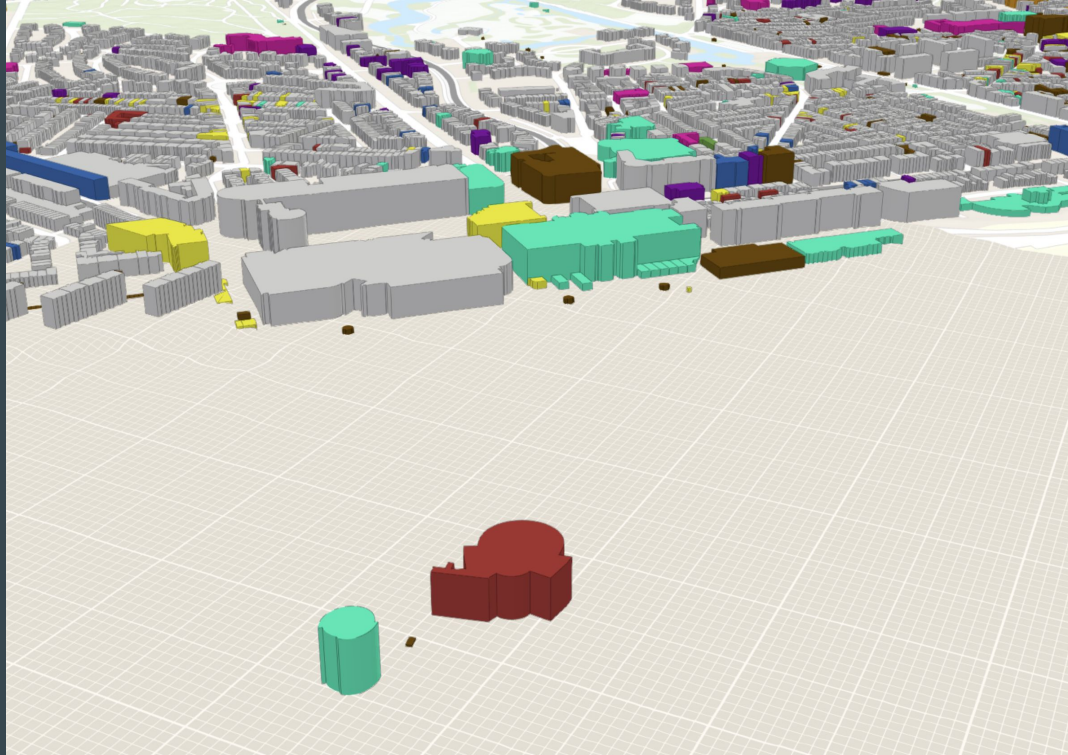
Floor Plans



Additional Features

- Ping System
 - Quick pathing to desired location
 - Save locations (vehicle)
- Method of Transportation
 - Choice will give slightly different paths
 - Handicap accessibility
- Notifications for Campus Events
- Emergency/Alert System
- 3D map of campus
- Complications
 - Save locations after application is closed
 - Redirecting user to elevator (when needed)
 - Obtaining information about events before they occur
 - Issues with 3D
 - Building a 3D model of the whole campus would be a lot more work
 - Display Lower Floors effectively

Envisioned 3D in ArcGIS



Conclusion

● First Term

- Obtain access to ArcGIS
- Obtain permission to use eduroam
- Learning ArcGIS
 - Get map data
- Learning Android Studio
 - Use Java and its built-in Library Leaflet library to build a base app
- Map out every buildings' entrances.
 - Update map data
 - Update base app
- Use JavaScript to build a web version of CSUB map for additional testing

● Second Term

- Implement 3D building layout
 - Obtain indoor flooring map data
 - Indoor navigation through eduroam (or alternative options)
- Implement user transportation method
 - Optimal pathing for selected transportation
 - Estimated Time Arrival
- Additional features
 - Ping function
 - Notification system
 - Ongoing campus events
 - Upcoming drills and alerts