Team Rocket: The Interactive Multilevel Campus Navigation Application

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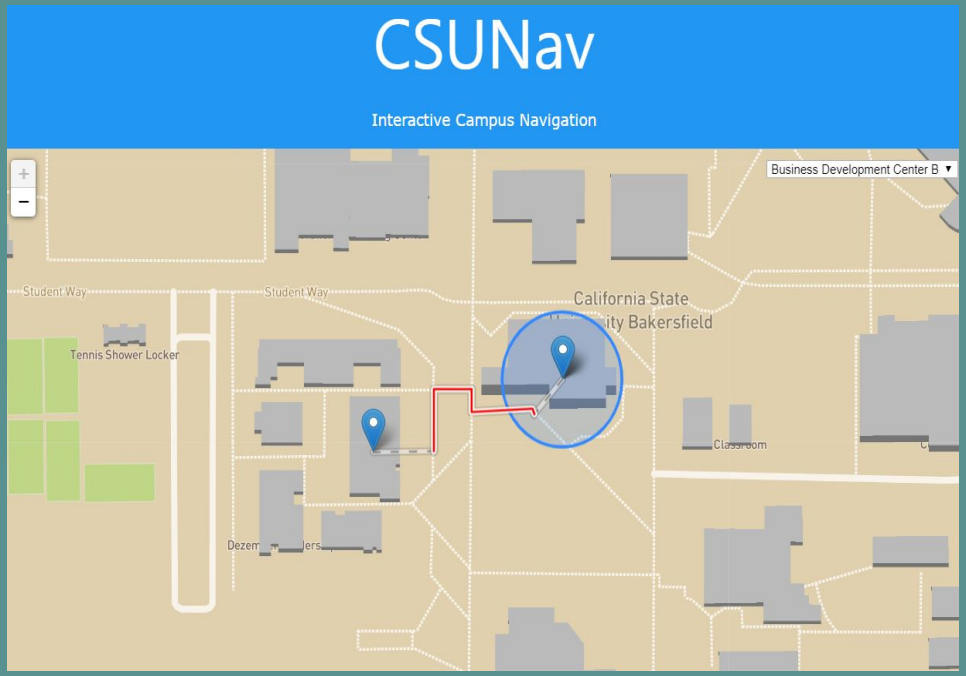
Concept

- Indoor/Outdoor GPS Navigation Application
- Android Studio
- Mapbox
- Java/JavaScript
  - Leaflet
- Real-time user location tracking
- Location search
- Map constraining



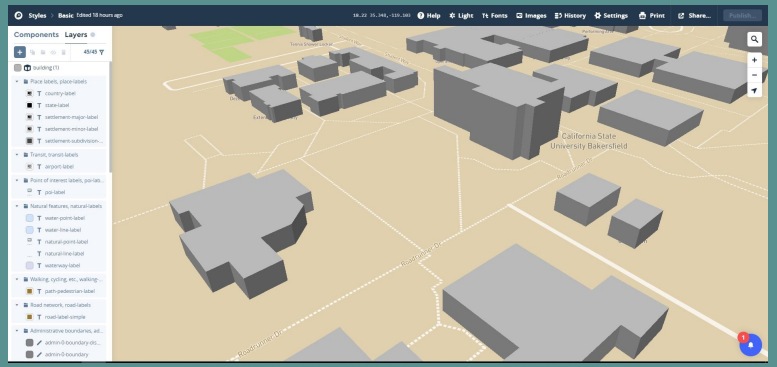
Revisions to plan

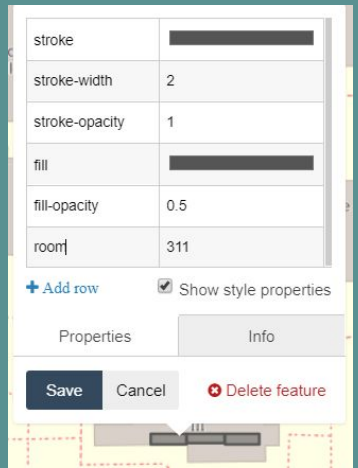
- Transition to mobile friendly web-based application
- Using bluetooth low-energy beacons
  - 4 would be optimal for triangulation
- Project would now be split in two:
  - Outdoor navigation (as we currently have it)
  - Indoor navigation (proof of concept on a smaller scale)

Outdoor Progress: Mapping and Goals

- Now hosted on Odin Server
- Mapbox Studio
  - Combine Leaflet Navigation Engine with Mapboxes maps
  - 3D extrusion of buildings
  - Learning to import custom tileset
  - Create tileset for each building

- More work to do:
  - Incorporate bootstrap to make it mobile friendly
  - Find a way to connect indoor positioning
  - Create Indoor slides
  - Use clickable links to move transfer to indoor maps





Indoor GPS Positioning via Bluetooth Low-Energy Beacons

- Use doorways as entry points to buildings that transition from outdoor navigation to indoor navigation
  - Proof of Concept
    - Develop a program to connect and track device location through a building
- Trilateration via BLEs
  - Trilateration: Determines distances by using range of devices and measures location where all devices intersect
  - Tracking device position via multiple beacons within range
- BLEs will currently only work with Androids, as that is what our application is built for
  - iBeacon and Eddystone are Apple and Google's beacon protocols respectively, but we would like to use Eddystone

Primary Goal

- Have CSUB partner with us in developing this application to better student's quality of life on campus.
- Present our project to the CSUB IT department
- Suggest to implement our mobile friendly app with the CSUB app
- Have a completed project for our portfolios

Alternate Solution

- Present it to other schools' IT department
  - Bakersfield College/Taft College
- Places that are difficult to navigate through
  - i.e. Valley Plaza Mall, Tejon Outlets, Hospitals, etc.
- Personal Use or Open-Source

Timeline

- February
  - FInish Tweaking the Outdoor Navigation
  - Create a responsive, mobile-friendly Web Page
  - BLE connection to device established
  - Create Indoor maps from our blueprints
- March
  - BLE connection and device tracking
  - Finalize proof of concept for indoor navigation
- April
  - Bug-testing and fixing
  - Senior Expo