Features

Path Finding

Acquire Map Data

Find Cycles in Graph & Plot Route

Find Intersections (Nodes) and Edge points

Create Graph representing Map Data
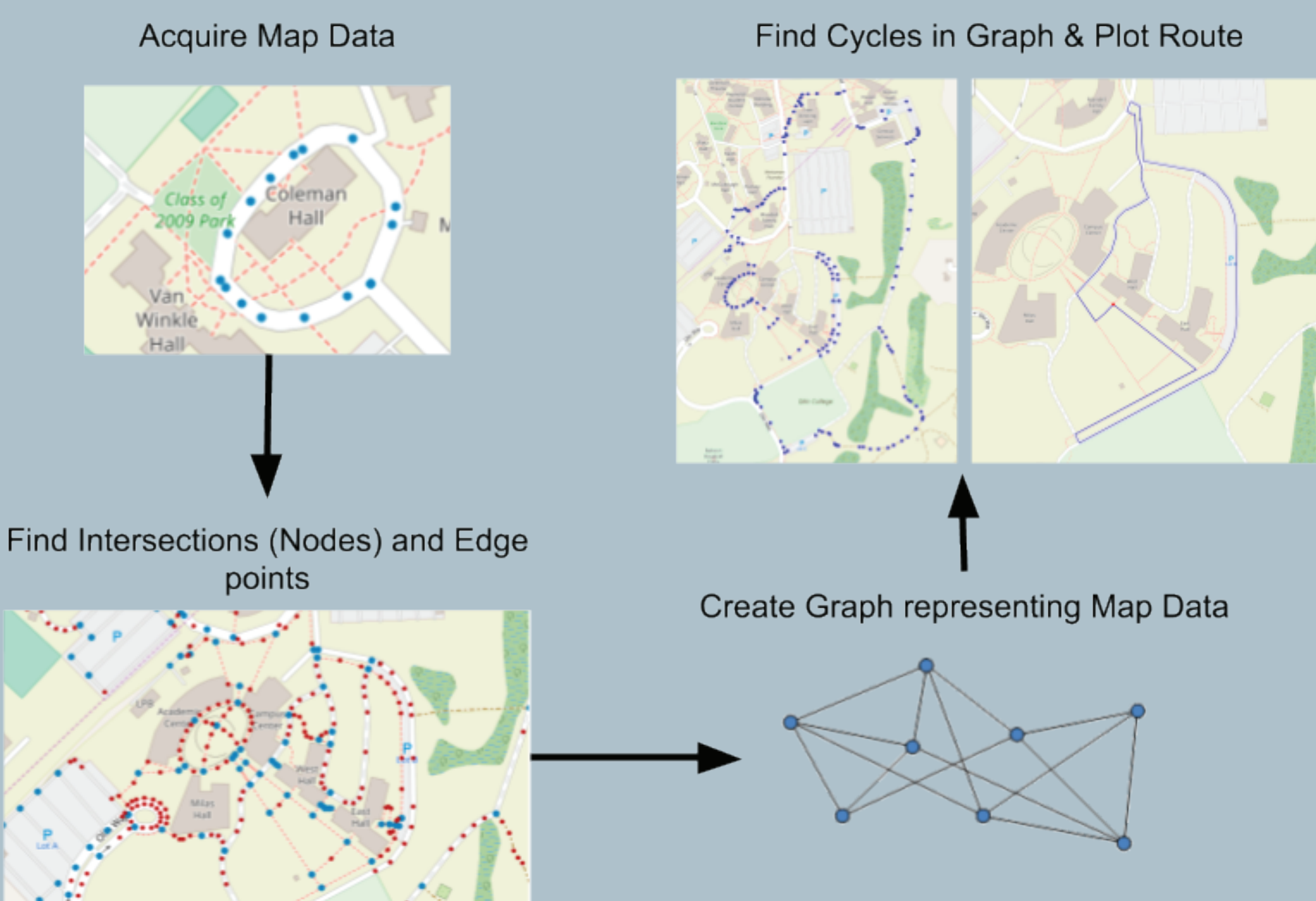
In order to find a route that never overlaps itself, we take data from OpenStreetMap and create a graphical representation of the map in terms of nodes and edges, making note of how each node connects to each of its neighbors. We then utilize a depth-first search to find cycles of a certain length in the graph, which we then choose from and plot on a map.

Weather Forecast

Today's weather will be Partly Cloudy and 83 F with a high of 75 F and a low of 62 F.
According to Yahoo weather on Fri, 04 May 2018 04:00 PM EDT.

Users can learn what today's forecast will be like for their run. The weather data is scraped from a Yahoo weather API.

Elevation Plot

We have also plotted the change in elevation for the path that we suggest. Elevation data is taken from the Google Maps Elevation API.

Trail Blazer
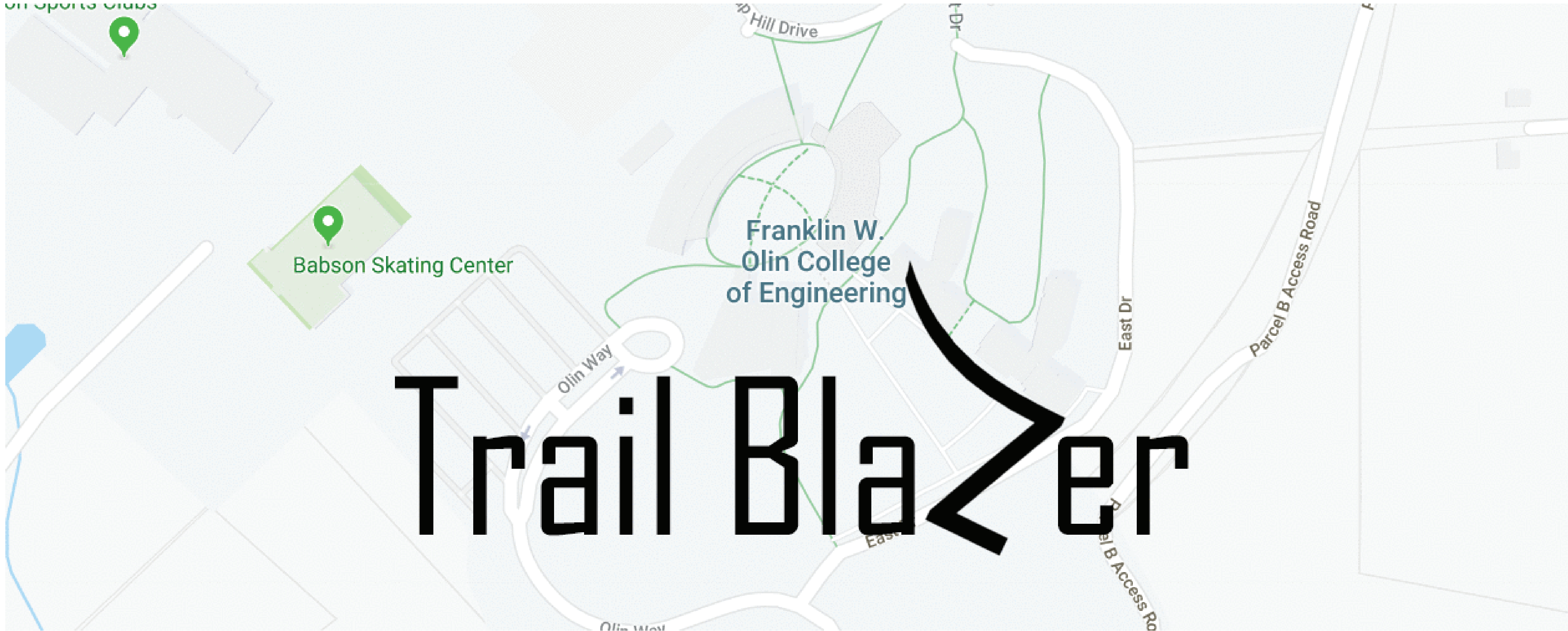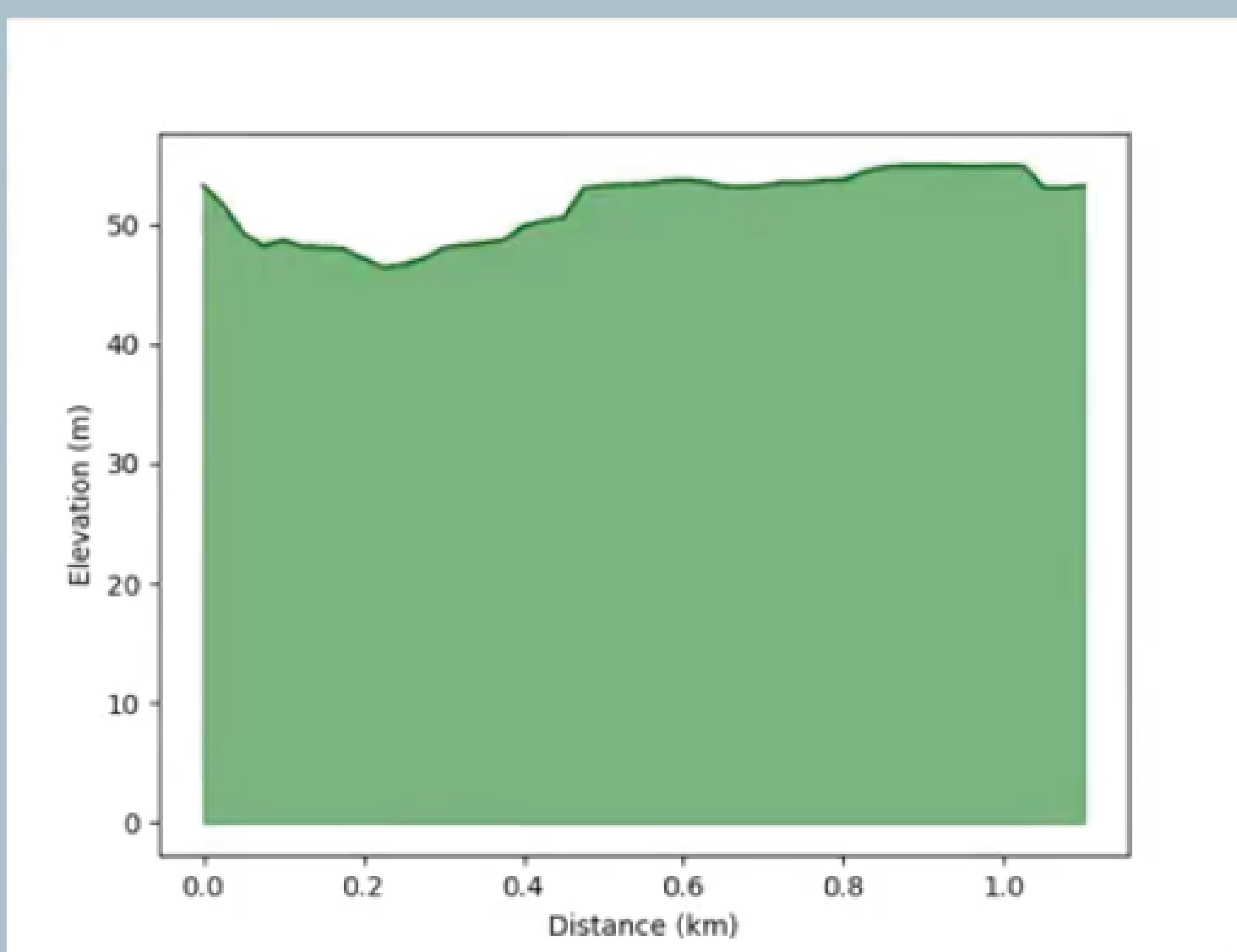
A Route Suggestion GUI for Runner

Created by : Dan Conolly, Raquel Dunoff and Lydia Hodges

Software Design 2018

Please log in to continue.

First Name = Lydia
Last Name = Hodges
Username = dra
Password = ***
Submit   Cancel

Hello! Welcome to your profile page!

Current Location = Olin College
Find Weather
Where would you like to go, Lydia Hodges?
Starting Location:
Latitude = 42.292922   Longitude = -71.263073
Distance(km) =   Maximum distance = 2
Find Route   View Elevation   Cancel

What is it?

Trail Blazer helps people on foot find new routes that never take them through the same location twice. Though some prefer to take the most efficient possible paths to every destination in life, Trail Blazer arose out of a deep-seeded desire for exploration. The team behind the GUI have worked tirelessly to create a route suggestor for running, walking, or biking routes that satisfy the distance and location specifications of users without ever routing you through the same point twice. With this project, we help people more fully realize their adventurer within.

See it in action at https://draconian9908.github.io/TrailBlazer/run.html

Implementation

Trail Blazer has several key components integrated into the GUI design. The GUI handles interactions between the users and the programs and controls how all of the visuals are displayed. When the GUI sends a request for a new route, the route-finding portion of Trail Blazer uses the Graph and Edge classes to create a route. At the same time, the GUI queries for and displays elevation and weather data from various API's.

A Meandering Path

In the beginning the team was excited to use an open source projects like OpenStreetMap but after some initial troubles, we shifted to using Google Maps API.
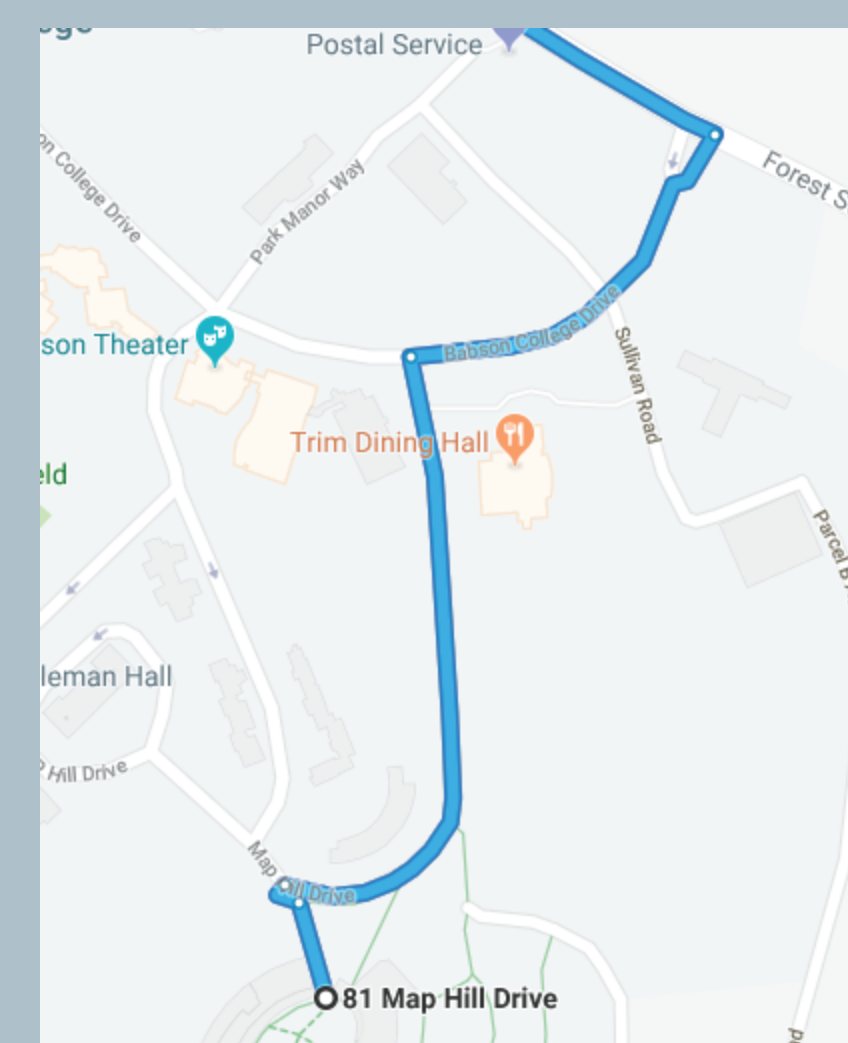
As a proof-of-concept, we then created a web app that generated a one way route using as-the-crow-flies distance in a randomized direction.

The Transition

Realizing the limitations of the Google Maps API, we pivoted to sourcing our data from OpenStreetMaps and building our own graphical represnetation of the map. This method was able to utilized cycle-finding algorithms to create a path that avoids overlapping.
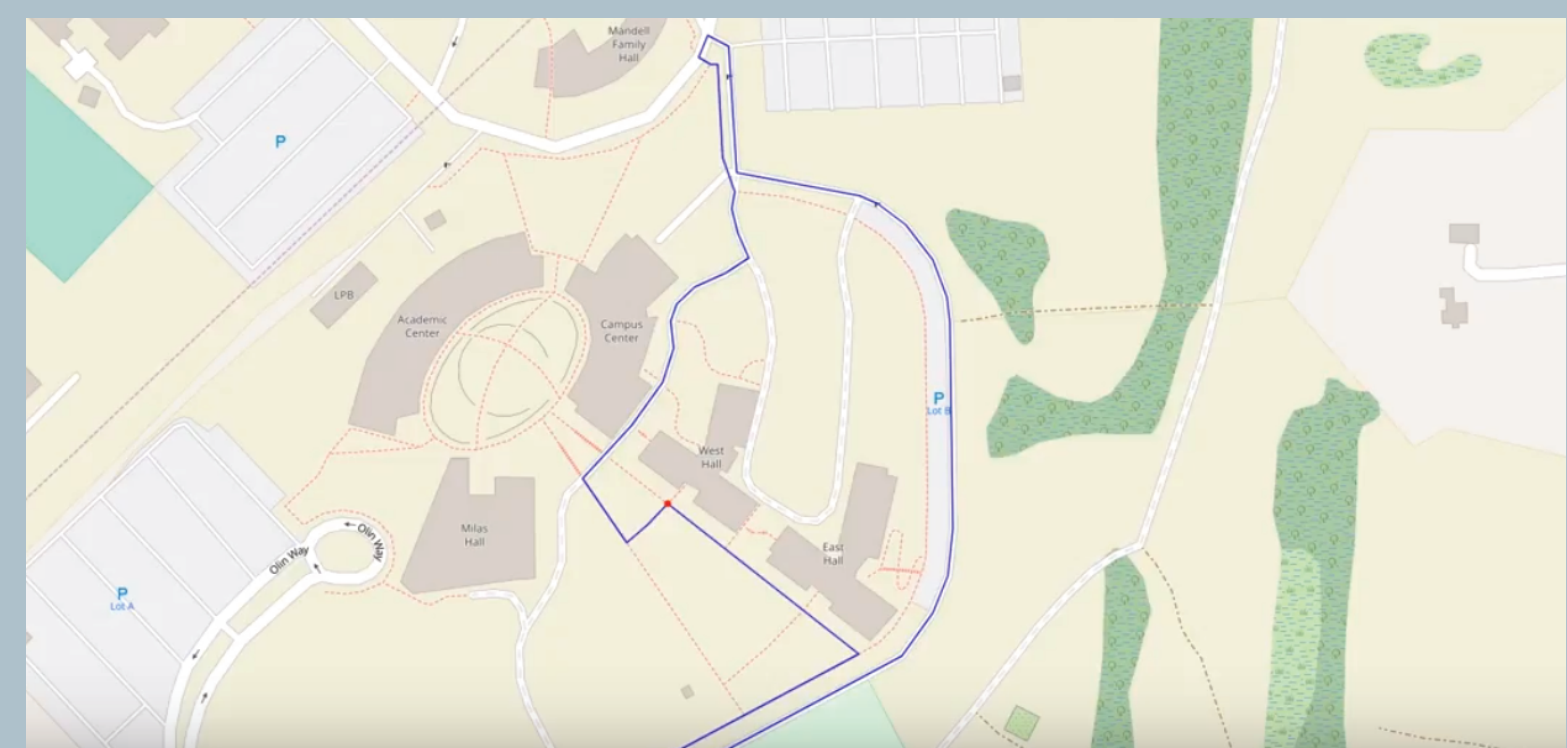
In Retrospect

Despite the fact that our product may be better suited for a web app than a GUI, the team found that creating a GUI better aligned with our learning goals. As a result, the team has painstakingly worked to incorporate more modern maps and web features with the rather out-of-date GUI toolkit that is tkinter.