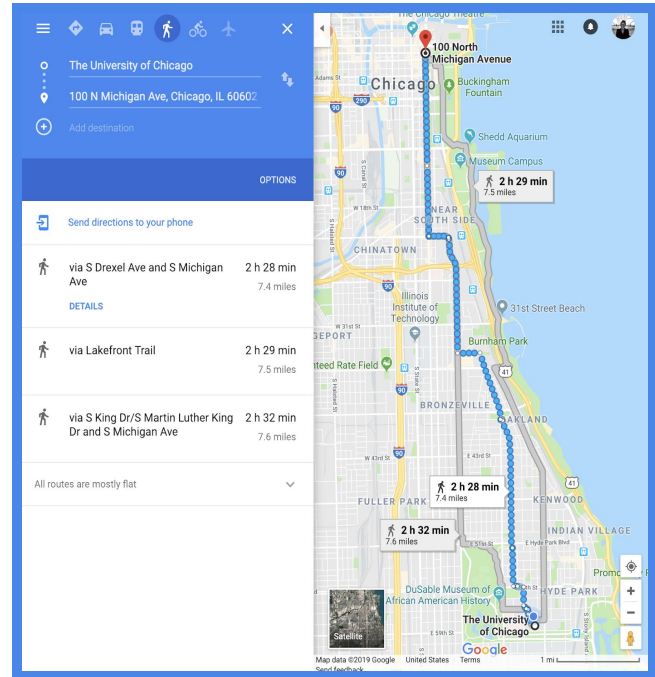


Safe Route

<https://github.com/aanyaj97/Safe-Route>

Overview + Goals

Google maps gives users the fastest route, but given the above average rate of crime and below average weather in Chicago, we wanted to build a website that provides users with the safest route and/or route with the best weather. Users would be able to select their priority (safety, weather, or both) and mode of transportation, and our website would provide the “best” route based on an algorithm.



We would first pull all routes from Google Maps, and then our algorithm would use pulled crime and weather map data to rank routes while also factoring in mode of transportation. For example, if the user selects driving as mode of transportation, the algorithm would prioritize vehicle related safety hazards (road accidents, car thefts, etc.) as inputs and give home robberies minimal importance. On the other hand, if our user is walking, car accidents would be ignored while issues like robberies would be given greater weight in the algorithm (we were originally hoping to also factor in icy roads, but there unfortunately doesn't seem to be data that granular available).

We haven't decided yet on if our algorithm will choose the absolute safest path without any regard to time, or it will pick the fastest path that is over a certain threshold of safety - we'll hash out the details of the algorithm once we better understand what data is available.

Data Sources

The primary data source for this project is the Crimes of Chicago dataset, which can be found at <https://data.cityofchicago.org/Public-Safety/Crimes-2001-to-present/ijzp-q8t2>.

The City of Chicago describes the data in the following way:

“This dataset reflects reported incidents of crime (with the exception of murders where data exists for each victim) that occurred in the City of Chicago from 2001 to present, minus the most recent seven days. Data is extracted from the Chicago Police Department's CLEAR (Citizen Law Enforcement Analysis and Reporting) system.”

For each crime reported, the dataset gives a plethora of information, most relevantly: date & time, type of crime, location of crime (both by city block and longitude/latitude), and whether an arrest was made.

For current road condition data we can use Illinois state data, found at

<https://www.gettingaroundillinois.com/WinterConditions/index.html>.

Because this source does not offer an API, part of our task will be extracting data from this source. Additionally, we will be using the Google Maps API for route information.

Tasks + Timeline

5th week:

1. Obtain and evaluate Crime & Weather Data + determine which aspects are most important for each mode of transportation
2. Determine high-level algorithm for how to pick "best" path--shortest, safest, or some kind of combination? Assign some "safety level" numerical value to each path in the end.

6th week (Progress Check-In Week):

3. Learn to navigate Google Maps API and determine best data type to store route information
4. Store Crime data in SQL database to some denomination (perhaps by single block or x block radius) to be searched when path is generated

7th week

5. Rank all paths generated by Google Maps API in terms of safety
6. Use Algorithm determined in (2) to pick "best" path
7. Backend functions should return path and maybe 3-4 more path options with all steps and safety score

8th week (Progress Check-In Week)

8. Develop Front-end:
 - a. Inputs: Start destination, end destination, travel methods (walk, public transport, driving)
 - b. Outputs: Image of Google maps route with highest safety score (this comes from the API itself)
 - c. If we have time: some map highlighting to show which areas are most to least safe based on records (with

9th week

9. Develop a user-friendly interface, potentially as a website
10. General cleaning up/streamlining of code
11. Compose write-up for submission and prepare slides for final presentation

Completed Software Due 5pm March 18th

Final Presentations 10th Week