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Summary

- For the data analysis part, the result of the algorithm was checked. Moreover, all data analysis processes were organized and merged. The Data Analysis part is complete.
- For the algorithm part, the route was drawn in the two different map types to verify that the four routes reflected the riskiness.
- For the front-end part, The main functions that route recommendation page and polygon function have been developed.
- The data analysis part's python code was added to the Flask API for the back-end part. The process of data analysis for the user in the API can be run with a 100 by 100 or 1000 by 1000 riskiness matrix.
- For the paper, The whole paper was checked, and the part where it needed editing was finished.

What Chasing FOX completed this week:

- **Data analysis**
  - Check the result for the algorithm.
    - Select the starting points and destination points.
    - Find the path of risk and distance ratio 0:10, 3:7, 7:3, and 10:0.
    - Check the average distance and riskiness of the 0:10, 3:7, 7:3, and 10:0 paths.
  - As expected, when the distance ratio became larger at the weight, the shorter path was recommended, but riskiness became larger. And when the ratio riskiness became larger at the weight, the distance became larger, but the riskiness became lower.
  - All data analysis processes were organized and merged into one file. The application used this file.
  - The Data Analysis part is complete.

- **Algorithm**
  - The route calculated considering the length and the risk score was drawn in the folium map as figure 1 and in the riskiness map as figure 2.
  - Red, brown, blue, and green lines each represent a risk and distance ratio of 0:10, 3:7, and 7:3. 10:0.
  - In figure 2, the green line, the safest route, avoids the yellow part, which means the dangerous area.

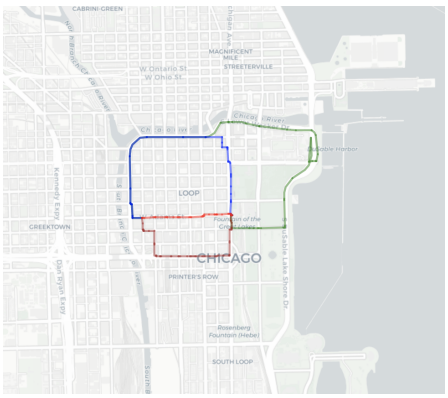

Figure 1. Folium Map

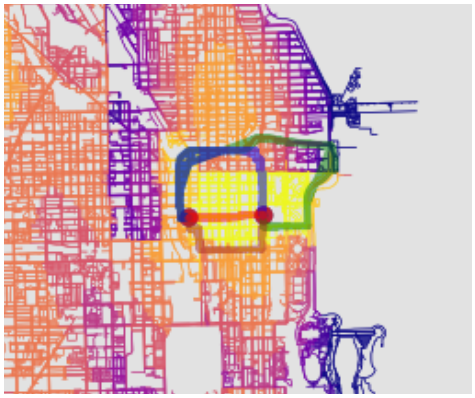

Figure2. Riskiness Map

- **Back-end**
  - In the Flask API, the sign-up request and the profile revision request were developed.
  - When a user requests sign-up, this API will respond to upload the user's custom crime weight graph.
  - When a user requests profile revision, this API will respond to change the user's custom crime weight graph pickle file id in Google Drive.
  - The 400 Exception process was added in the Flask API. This exception will be responded to if a user inputs the wrong coordinates. For this, the Shapely library was used. [1]

- **Front-end**
  - Polygon function development on the main page has been completed.
  - The waypoint received from the server was saved using the global storage.
  - The development of the route recommendation function on the main page has been completed.
  - Communicated with the back-end server, branching out the number of cases where errors occur. For example, if a login fails, It shows why it failed using an alert component.

- **Paper**
  - Additional information was added throughout the paper, including the figure in the methodology part.
  - The whole paper was checked, and the part where it needed editing was finished.

Things to do by next week

- All the figures will be added to the paper, and the paper's content will be edited by next Friday.
- For the algorithm part, the figure, for example, of the route will be drawn for the paper.
- The overall UI/UX elements will be modified for the front-end part, and The splash screen will be developed. Finally, the App development will be completed and will be tested.
- For the back-end part, the Flask API will be completed and tested with the front-end.

Problems or challenges:

- In the back-end part, the data analysis code applied 1000 by 1000 riskiness matrix was too slow to test for application. So, the 100 by 100 riskiness matrix was used for the application test.

References

[1] "The Shapely User Manual." Shapely. https://shapely.readthedocs.io/en/stable/manual.html [Accessed: Dec 1, 2022].