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Summary

- Using KSW server, Setting of the web server was done.
- The application's screens were set by React-native.
- The abstract and introduction part of the paper was revised. And the draft of the related works part will be completed by next week.

What Chasing FOX completed this week:

- **Data analysis**
 - Of the 33 primary types in the crime dataset, 5 types of violent crime which were defined by the National Institute of Justice [1] were weighted higher than the other types of crimes (Fig 2). Violent crimes include rape and sexual assault, robbery, assault and murder.
 - Population normalization was applied to weighted crime density maps (Fig 3).

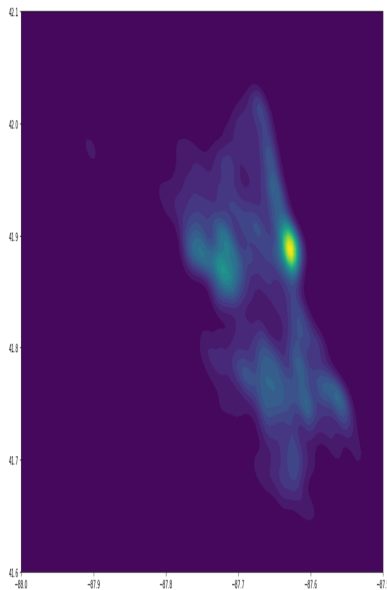


Fig 1. Crime density contour map without considering weight

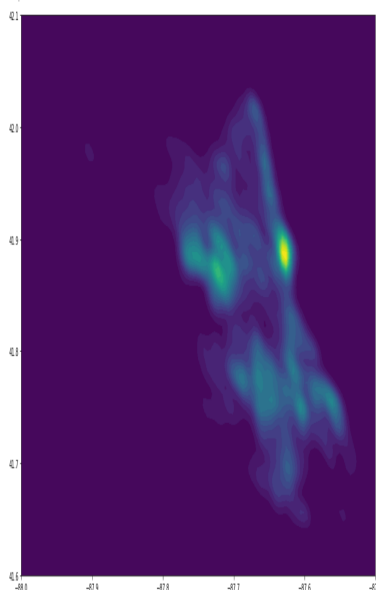


Fig 2. Crime density contour map considering weight

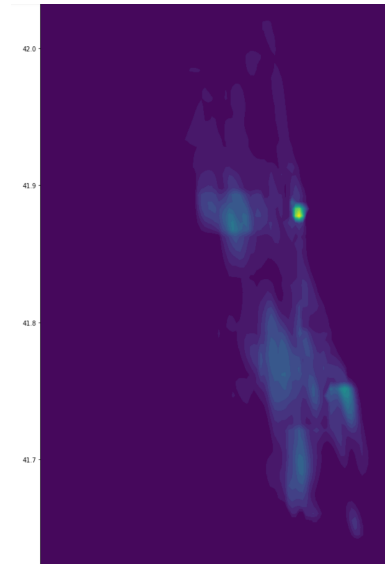


Fig 3. Crime density contour map considering weight and population distribution

- Kernel density estimation was applied to 12 types of city facility and service request dataset, and Correlation was calculated with weighted crime density map. (Fig 4)

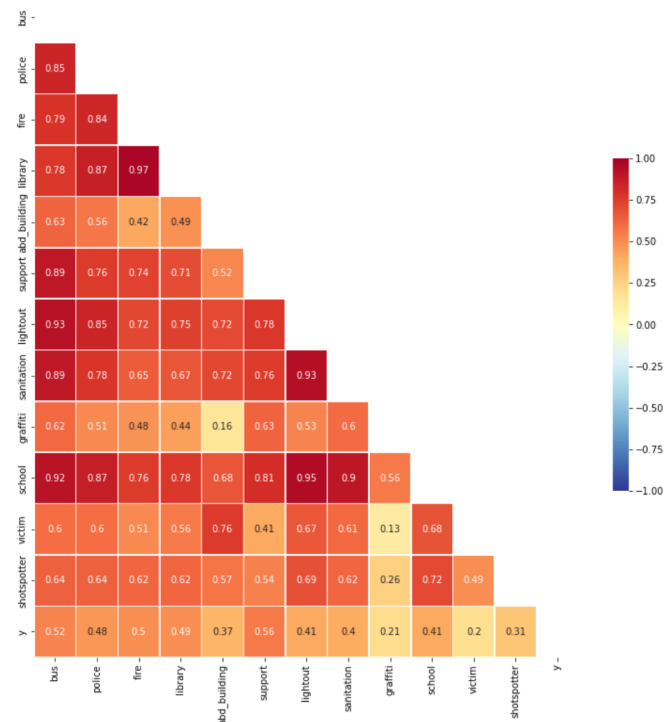


Fig 4. Correlation between density of weighted crime and density of facility and service request.

- **Front-end**

- Screens of Application were set by React-native. (Fig 5) [2]

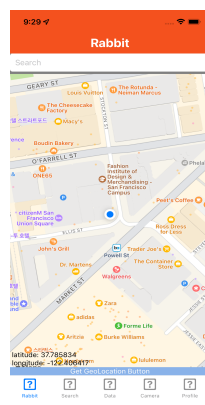


Fig 5. The map test page of the application

- UX/UI design have been changed continuously.

- **Back-end**

- Setting of the web server using KSW server was done.
- In the server, MySQL was installed for the database, JDK(openjdk version 1.8.0_342) and tomcat9 were installed for the web deployment.

- The API about users deployed on the web server. The example API is as follows.
- <http://192.168.2.117:8080/api/user>
 - Read all users in the database.
- <http://192.168.2.117:8080/api/user/1>
 - Read an user in the database whose id is 1.
- **Paper**
 - The abstract and introduction part of the paper were revised based on feedback.
 - The structure of the related works was organized. The summary of other papers [3] - [5] was done.

Things to do by next week

- The draft of the related works will be completed.
- UX design about the application's process will be completed.
- The standard of establishing the weight of each crime will be decided.
- In consideration of the Illinois' criminal sentences, a method of weighting based on the risk of crime will be devised.

Problems or challenges:

- This research was trying to establish the weight of each crime based on the guide handbook of the Illinois felony class. But this process was too complicated. To maintain this research's novelty, another method of establishing the weight of each crime will be found by next week.
- While writing the draft of the related works part, a paper [6] similar to this research was found.

References

- [1] "Violent Crime." National Institute of Justice. <https://nij.ojp.gov/topics/crimes/violent-crime> (accessed Oct 06, 2022).
- [2] "Maps JavaScript API." Google Maps Platform. <https://developers.google.com/maps/documentation/javascript> (accessed Oct 06, 2022).
- [3] E. Galbrun, K. Pelechris, and E. Terzi, "Urban navigation beyond shortest route: The case of safe paths," *Information Syst.*, vol. 57, pp. 160–171, Apr. 2016.
- [4] Y. Zhao, Y. Xie and S. Ahvar, "On Integration of Any Factor with Distance for Navigation : Walk Safely and Fast Enough," *2019 IEEE 23rd International Enterprise Distributed Object Computing Workshop (EDOCW)*, 2019, pp. 92-95, doi: 10.1109/EDOCW.2019.00026.
- [5] Soni, Venkatesh Gauri Shankar, and Sandeep Chaurasia, "Route-The Safe: A Robust Model for Safest Route Prediction Using Crime and Accidental Data", *Int. J. Adv. Sci. Technol.*, vol. 28, no. 16, pp. 1415–1428, Dec. 2019.
- [6] N. Goel, R. Sharma, N. Nikhil, S. D. Mahanoor, and M. Saini, "A Crowd-Sourced Adaptive Safe Navigation for Smart Cities," *2017 IEEE International Symposium on Multimedia (ISM)*, 2017, pp. 382-387, doi: 10.1109/ISM.2017.77.