

sdmay19-18: Real time Route Optimization

Week 7 Report

October 27 - November 4

Team Members

Junjie Wen — *Backend Developer; Data Analytics Lead*

Zhanghao Wen — *Product Manager; Technical Writing; Weekly Status Report*

Yuhang Xie — *Web Developer; UI Lead*

Xinhe Yang — *Web Developer*

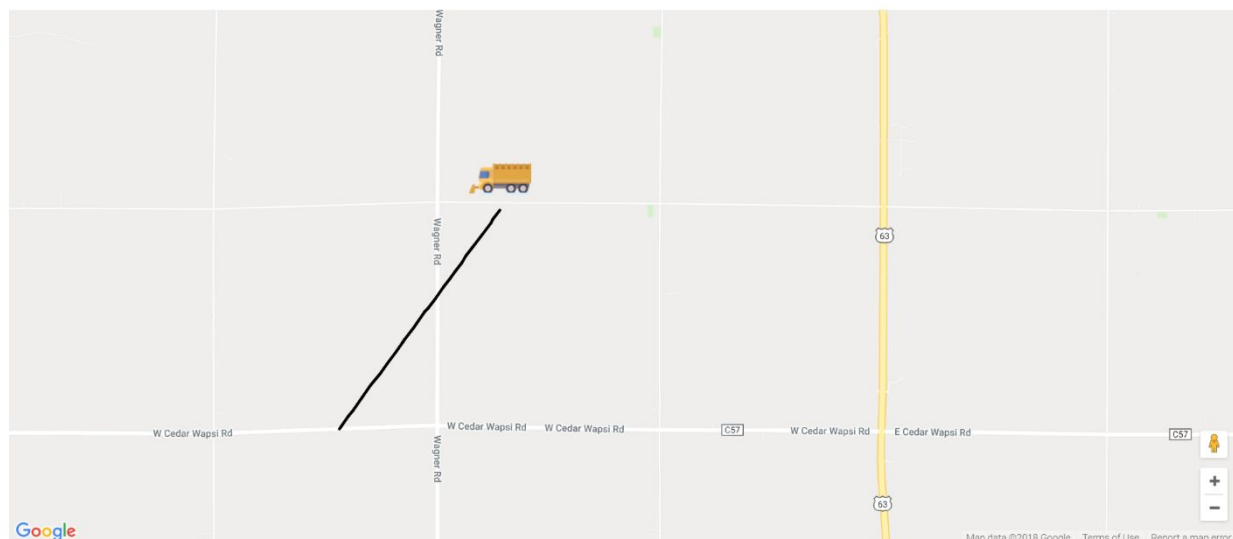
Tianhao Zhao — *Communication Leader*

Summary of Progress this Report

- Represent the path of a truck based on given GPS information
 - Refined Login web application interface
 - Analyze real situation and practical meaning of our project – how our products can help fleets performance.
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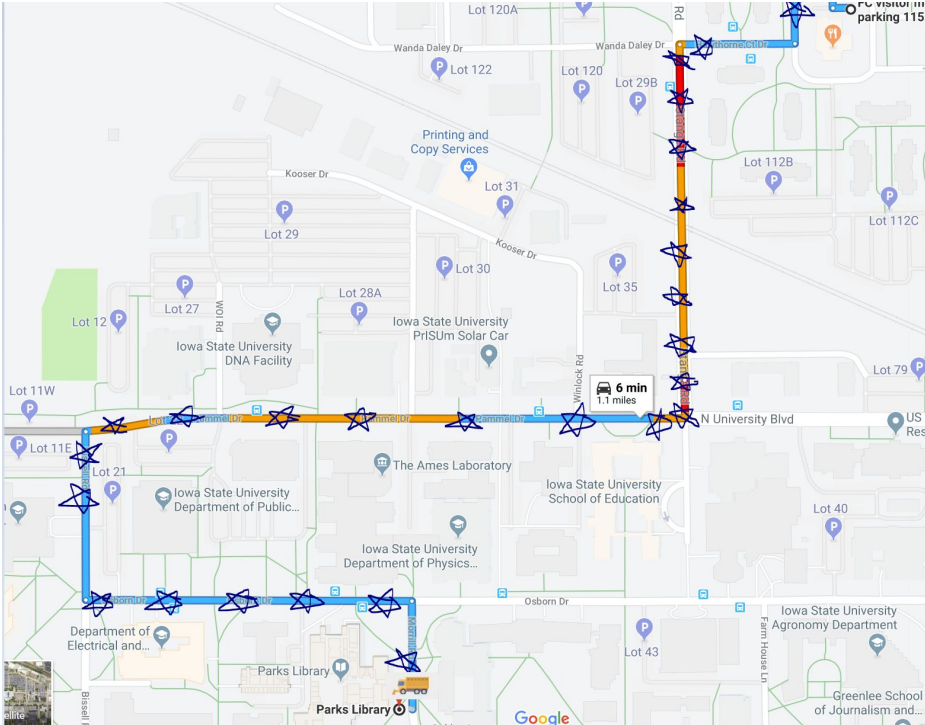
Past Week Accomplishments

Currently, we can show the path of one truck based on its GPS information that is sent from simulator in server. The figure below is what we got.



One problem we are facing is that, the GPS data is generated from simulator which cannot match the real road coordinates shows on the map. So we can see that the path location of truck above is a bit unrealistic. However, we believe this is easy to test when real GPS information will be sent from actual sensor, and that would look more realistic.

Another issue is that, currently we cannot represent historical path information. We will continue to develop showing truck conditions along with the path. So once you click a certain dot you can know truck's information like plow up/ down, equipment rate, direction, speed information, etc.



The above figure shows a scenario we assumed, that in snow operation a snow plow drives from FC to Parks Library. The pentagram symbol represents the data dots along with path which user can click to view the truck's condition. We assume that every time of update one pentagram will record the truck position. The actual (expected) updating rate for dots is 5 seconds per dot.

As you can see, because of various speed of truck, which depends on traffic, the pentagram will be displayed with different length of segments. Right now the color of the path represents traffic info. Once we get the acceleration data from sensors on the truck, we can calculate the speed of truck, and adjust the spreading speed of truck (provides the spreading speed calculation) in order to reduce waste and maximize the operation efficiency. We will implement the data type in the server and write relative algorithm to it in order to make this possible. For the color of the path, we will put emphasis on the road snow conditions, whether the road needs second time of snow operation or the road is clear.

We can calculate the truck speed based on GPS information, if we are also provided the recommended spread rate at each certain road condition or weather condition, we can give truck driver (if applicable) a real-time analysis of dispenser rate. Therefore, we can improve fleets operation efficiency, clean road effectively, and reduce waste of materials.

Pending Issues

1. Showing multiple dynamic vehicles in web frontend interface.
 2. Store and present historical path truck data.
 3. Login information for 3 different groups of users: public, member/driver, full access/manager/dispatcher.
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Plans for Upcoming Reporting Period

We will continue working on simulator as well as trying sample data as our input instead of simulator. We will also implement our web application interface.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Junjie Wen	Improve the simulator for front-end testing purpose	5	52
Zhanghao Wen	Modify project plan, weekly report, and manage Trello.	4	63
Yuhang Xie	Web UI for displaying truck and its data.	6	56
Xinhe Yang	Polishing Login web interface	6	53
Tianhao Zhao	MoM recorder, meeting with client, help with project	5	47

Gitlab Activity Summary

Code is committed to members' local repository.
