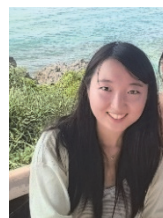# US Design Tour Report
アメリカデザインツアーレポート

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At the end of September, we went on a design tour in US. We visited two museums, several famous laboratories or companies. This article shows my experiences of visiting a company and a museum in the tour.

How Uber researchers use Visualization to improve their design processes

Among these places which I had been most interested in was Uber. Because in our seminar some students are doing research on driving behaviors, such as mind wandering detection which can be used to design driving support systems. I do believe that this kind of driving support systems can reduce traffic accident and benefit a lot of people. Uber drivers might be the most in need of driving support as they are usually not professional taxi drivers. Moreover, they often communicate with diverse customers while driving on a strange road. So I am curious about how Uber educate their drivers and how they do driving support through mobile devices.

However, the only team we have visited in Uber turned out to be the visualization team, they showed us nothing about driving behaviors but a lot of advanced and impressive visualization techniques which were far more interesting than I expected.
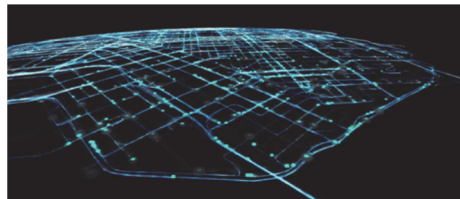
Things about Uber

As we know, Uber is an American worldwide online transportation network company famous as a smartphone app called "Uber", which provides us a new style private transportation service. Uber Co-Founder and CEO Travis Kalanick explains, "In the beginning, it was a lifestyle company. You push a button and a black car comes up. Who's the baller? It was a baller move to

get a black car to arrive in 8 minutes."

Resent years they have grown rapidly and have been extended to more than 527 Uber cities (in seven years since established in 2009). In addition to the ride business they also launched several new services such as UberEATS, a food delivery service.

Things they have done with Visualization

We visited Uber headquartered in San Francisco. When we entered the office area, a dynamic color map was displayed on a huge screen and immediately attracted our attention. They were just so amazing like a piece of art. (Photography is not allowed. Instead, we have pic.1, an online resource[i].) Then we immediately knew that these maps were developed by our host, the Uber Visualization Team. And soon they began their presentation including some details about how to make those amazing maps.

pic.1   Data Visualization at Uber

The first speaker mainly talked about basic visualization techniques. And he showed some examples on how to achieve a faster and efficient communication by using these techniques.

Next, they showed how to draw a map and tools they developed for other researchers to draw various information on a map, such as the direction of the flow of Uber rides or simply the traffic volume, etc.

In the final part, the topic was how to achieve efficient visualization as well as some application examples such as the visualization of neural networks during deep learning. Usually, the neural network training process is known as a black box; we are not able to observe what is happening on the neural networks until we get the training result. The technique may help researchers to detect problems in learning algorithms.

What I have learned from this workshop

Visualization can give us good looking pictures, and more important, it can offer us a huge amount of information summarized in a few figures. So it could be easier for us to learn from data and to find the hidden information from big data. Although they didn't mention anything about driving

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[i] https://eng.uber.com/data-viz-intel/

behaviors, I could still get enough information from those art-like visualization results to imagine the drivers' work environment.

Besides Uber we also visited another transport system, the San Francisco cable cars. After a short ride on cable cars, we got to the first stop of our design tour: the Cable Car Museum.

The Cable Car Museum — An impressive but unpopular museum

According to travel guidebooks, riding on cable cars is a must do in San Francisco. However, few of them mentioned the Cable Car Museum. And during our visit to the museum, in addition to our members there were only about 10 visitors, even less than we had expected. So what makes the museum of that famous Cable Car not so popular?
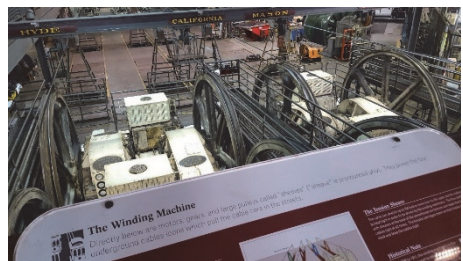
About the museum

The Cable Car Museum located on the corner of Washington Street and Mason Street (pic.2), in the same building with the cable car barn and the powerhouse (pic.3). So it's not just a museum but also an essential functioning part of the cable car system. Inside the museum, you can see the machinery that runs all the cable cars in San Francisco. The mechanical parts, car bodies, cables, are all shown as exhibitions. Also, they have many introduction boards, pictures, and videos to help visitors understand the whole system. The museum has a great range of history:

pic.2　Cable Car Museum

pic.3　Winding machine in the powerhouse

1). History about the older lines and their impact on San Francisco development. There were a lot more lines, once upon a time. You can see how they were laid out, and you can also see how the companies thrived or failed.

2). Andrew Hallidie, the engineer who made cables and was instrumental

in the mining technology. The story goes he saw a horse-drawn carriage slide backward down a steep muddy hill.

3). Friedel Klussmann, "The Cable Car Lady", who saved the Cable Cars from their potential final demise. She formed the Citizens' Committee to Save the Cable Cars and won a referendum in 1947.

4). Information about a great earthquake and massive restoration that took place in the early 20th.

Those mechanism and history were very impressive to me. I do believe the Cable Car Museum is worthwhile to visit.

One of the theme in this tour was to find out how the museum had been designed. Unfortunately, I couldn't find any special design method in this museum. It seemed that they only displayed what they had in the factory downstairs and then simply gave some explanation. However, they do provide enough information for visitors. So that they can find the cable car ride a lot more interesting. If the problem is not inside the museum, we should consider the design outside of the museum.

Some unappealing point

According to my observation, here are three unappealing points which may be the answer why the cable car museum is unpopular.

a. Inconspicuousness

Since the museum is not mentioned in guidebooks or even on the cable car tickets. Most tourists didn't even know there was a museum, especially for cable cars, despite the two main cable lines running in front of the museum.

b. Unexpected Cost

The admission is free, but if you don't have a passport pass, after visiting the museum you need to purchase another one-way ticket to go on their rides.

c. Noise

Because the museum is located right above the powerhouse, it is too noisy to stay for a long time.

Hope these suggestions can be helpful. So that more visitors can be

impressed by the Cable Car Museum and enjoy more on a cable car ride.

In the end

Back to something about drivers.

Unlike Uber drivers and other normal drivers, cable car drivers were standing in the middle of the cable car while driving. I took the photo (pic.4) right behind the driver, but I had no idea what the driver was doing. I was even not sure whether he was a driver; for me he was more like a conductor. After visiting the Cable Car Museum, I realized that the driver's work was much more complicated than I could see. They operate complex and cumbersome mechanical structures and also need to communicate with the on and off passengers, not to mention the safety while driving on those steep ramps in San Francisco.

pic.4　Cable car driver

So I came to the conclusion that it would not be possible to design a truly useful driving support system by just sitting at a driver's side. We also need to observe the environment in which the driver and the vehicle are located. In many cases, the environment is infinite, it is impossible to observe the whole thing, so we cannot find the optimal solution. But we still need to try hard to consider as many environment variables as possible in order to be as close as possible to the optimal solution.

Inquiry towards studies of design
+ Is there an optimal solution in the design?