

# 東京工業大学 工系3学院

## 超短期留学報告書

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## **Report of Taiwan Summer School Program**

**August 16<sup>th</sup> -26<sup>th</sup>, 2017**

The Taiwan Summer School program was hosted by National Taiwan University of Science and Technology (NTUST) and it ran for two weeks. This program brought students with different engineering backgrounds, culture and nationalities from four different universities in Japan and NTUST together for the two weeks long program. The participating universities from Japan were Tokyo Institute of Technology, Tokushima University, Osaka Institute of Technology and Shizuoka University.



### **Taiwan Summer School Participants**

The program focused on cooperative work within students from different background, university and nationality to resolve engineering problems as well as inter disciplinary and cross-cultural exchange. The basic purpose was to promote and enhance the intensive theoretical and experimental approach to study of various engineering knowledge.

The studying projects, goals and extra curricula activities were as follows:

- Fundamental knowledge of science and technology for smart society
- Product design thinking and presentation skills
- Factory visit to Fuel Cell Company (APFCT) and Machining Manufacturing Company (FFG)
- Adventure Taiwanese culture and Chinese Language
- Taipei sightseeing

The participants were divided into seven groups of about six students each. Each group included a participant from the host university and the different universities participating in the program and mostly of different engineering background.



### **Group Discussions**

Various lectures by professors from different engineering fields were delivered and after each lecture group discussions were held with subsequent presentation by each group on each lecture. The following generic and engineering topics were discussed:

- **Development of Thermoelectric Materials**

This lecture was delivered by Professor Y. W. Chai, a professor at Tokyo Tech. In his lecture he explained the principles of thermoelectric effects as well as giving practical applications of thermoelectric material. Thermoelectric effect is basically the phenomena by which a temperature difference creates and electric potential or vice versa. He went further to explain the challenges of developing this kind of material and strategies to tackle such challenges.

- **Smart Factory by Industrie 4.0**

In this lecture we learned about the industrial revolution from the water powered and steam-powered mechanical manufacturing facilities to the now and fourth generation Industrie 4.0. This involves the use of Cyber Physical System (CPS), the inter-networking of physical devices, vehicles, buildings and other items embedded

with electronics or Internet of Things (IoT) as it is known and cloud computing to form a smart factory. The professor also discussed briefly about Big Data Analytics and the current researches on this topic at NTUST. We also visited the Industrie 4.0 laboratory at KNUST.



**NTUST Industry 4.0 Lab**

- **Presentation Skills**

In this lecture a professor from a NTUST gave us a step-to-step practical guideline on presentation skills. He went further to explain the importance of each component of a presentation outline. It was interesting to note that presentation principles are basically similar in all fields of science. This gave me us valuable knowledge on the purpose and construction of a good presentation.



**Group Presentations**

- **Fuel Cell Technology**

Here we were given a brief introduction of Electrochemistry and Fuel Cell. Electrochemistry is basically the reaction involving charge transfer usually electron across an interface between two phases. Fuel Cell is the use of this process to create electricity. It operates like a battery and only emits heat and water which makes it a green source of energy.



- **Manufacturing Process Design**

This lecture took us through the journey of understanding design thinking and its applications. The design thinking process includes understanding of what people want, bringing clarity and focus to the design space, brainstorming storming with a team to bring ideas together, designing of a prototype and testing of the product. The lecture was follow by an activity of making a design by each group.



**Activity: Product Design**

- **Application of Color Technology**

In this lecture we learned the history and principles of color technology. This included the naming of colors and choices of application. A basic exercise on the application was also conducted.

## Factory Tour

One day of the two weeks program was dedicated to factory visit. We visited two companies in Taiwan. The first company was a fuel cell technology company called Asia Pacific Fuel Cell Technologies Ltd and their focus is on developing fuel cell powered motors such as scooter, vehicles, and generators and so on. We were later given the opportunity to test some of their products.



### Asia Pacific Fuel Cell Technologies Ltd

Later, we visited Fair Friends Group, an international company that develops machining parts for automobiles. Here we saw the application of Industry 4.0 and visited the machining center of the company. We also saw a display of many of their products ranging from airplane parts and car parts. This was an interesting experience which gave us the opportunity to see how the industries work.



### Fair Friends Group

## **Taiwanese culture**

It's usually said that Taiwan is pro-Japanese and we had the same feeling during our period of stay. The people who came to Japan in the past and those who intend to study at a Japanese university in the future were part of this summer program, and there was a person who speaks fluent Japanese too. They are also very familiar with Japanese culture, music comedy, animation, and so on. The stores that I come across in Japan existed in many case of a sightseeing tour of the city, and there was a shop assistant who answers with Japanese, too.

Many people are using a scooter in Taiwan. Many of the scooter runs near the pedestrian on the sidewalk and the small road felt a little bit dangerously for us. A train also runs through Taiwan like Japan. The Taiwanese subway is called MRT and is really similar to the Japanese subway. While train tickets in Japan are paper made, it's mentioned that in Taiwan tickets are made of plastic coin and eating and drinking is prohibited within the train stations in Taiwan. It is commonly said that the Japanese trains are punctual, but Taiwanese trains as punctually effective too.



## **Taiwanese traffic**

I think night market can be named as the feature of the Taiwanese culture. Many street stalls are opened every night, and it's possible to buy a lot of kinds of food and drink at the low prices. Most Taiwanese foods and drinks are very delicious. But the Taiwanese tea was rich in sugar in spite of it being black tea, oolong tea and green tea. Japanese people find it quite strange to drink.



## **Taiwanese drinks and foods**



## Sightseeing in Taiwan

The two weeks stay in Taiwan was amazing. Of course, there are a lot of reasons for this feeling. If I pick out one, it is the amazing sightseeing with fantastic friends. We had classes on weekdays, but every night and weekend Taiwan Tech students took us various places like night markets, sea-side, old streets and so on.

- **Night markets –Gongguan, Raohe Street, Shilin**

In Taipei city, there are a lot of night markets. Almost every night we went to night markets to eat dinner, enjoy games and shopping. There are not only static shops but also a lot of food carts. We can eat any kinds of Chinese food at cheap prices. We ate dumplings, poke sausages, beef noodles, and other fantastic foods.

There are game spots, either. Our friends enjoyed pinball and gunshots. In Japan, there are few spots like that anymore, so we enjoyed it a lot.

I need to mention that each night market has different features and below is what I think about the differences:

- **Gongguan night market**

Gongguan night market is nearest night market from NTUST. There is National Taiwan University opposite NTUST and next to the night market and here prices are relatively cheap. Actually, it's not a big market, but it became our most familiar market while we stayed in NTUST.

- **Roahe Street night market**

Roahe Street night market is near from Songshan St. From NTUST, it takes 30 minutes to get there by bus. This night market is composing mainly of one street, Roahe Street. In the middle of the street, food carts or other carts are making lines. We can enjoy all shops if we just follow the stream, so I think it is elementary night market for tourists.

One special thing to write here is pepper pie. Pepper pie is one of Taiwanese local foods. In the pie there is pork meet seasoned by pepper.







Roahe Street

➤ **Shilin night market**

Shilin is the most famous and popular night market among tourists. In the center of the area, there is the permanent mall with a ground floor and an underground floor. On the ground floor, there are lots of game spots. Gun shootings and darts are mainly played. On the underground floor, there are Chinese restaurants with fresh fish or other seafood.



● **Sea-side –Tamsui**

Tamsui is on the north of Taipei city, and is a sea side area. It is very romantic place and there were a lot of tourists. Here, I will introduce some places.

➤ **Tamsui Old Street**

Tamsui Old Street is a mall from near Tamsui St. We can enjoy souvenir shops, snacks, tea. I enjoyed a hot pot and ice cream around. There are old buildings like Tamsui church beside the street and as a memory of the journey, our team asked local girls to take a photo with us. I know it was hitting on them, and if it was in Japan, we cannot do that

because we are SERIOUS students. We could do that because we were on a journey, and I'll never regret it.



Local cute girls

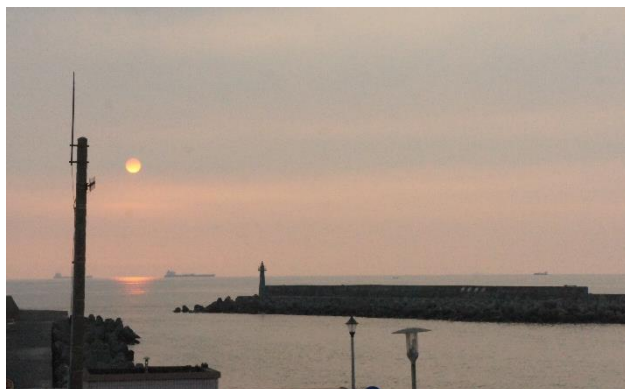
➤ **Fort San Domingo (紅毛城)**

Fort San Domingo is an old fort built by Spanish and had been used as English Consulate. The scenery is beautiful, because it stands on a river side hill. We can feel comfortable wind, so it was good place to take a rest. From here, We can learn history of Taiwan, especially Tamsui, by exhibits.



➤ **Tamsui Fisherman's Wharf**

To get Fisherman's Wharf, we need to board a ship for about 15 minutes from Tamsui main area. Tamsui is famous for sunset viewing spot; especially Fisherman's Wharf is the best place to view from. Actually, there are not so many shops or restaurants there, but we can see the beautiful sunset from the wharf or the romantic bridge. Many tourists and lovers come here in the twilight.





**Boat to Fisherman's Wharf**

- **Shifun**

Shifun must be the most famous sightseeing spot in Taiwan. In Japan, it is fondly known as it became a model of Japanese famous animation "Spirited Away" (千と千尋の神隠し). In Shifun, the roads are very complex and ornamented with red lanterns.

- **Taro ball (芋圓)**

A taro ball is made by eddoes, chewy and a bit sweet. I ate it with shaved ice and condensed milk. As you know, Taiwan is a very hot place, and the day we visited Shifun was a very hot day. So a cool taro ball with shaved ice was very delicious.



- **Tea shop**

Originally, Taiwan is famous as a habitat of Chinese tea. So in every city and town have many tea shops especially shifun. There are several popular shops like 阿妹茶酒館 which is believed as the base of Spirited Away. Actually my team didn't visit any of them, but I heard that some team visited tea shops, and enjoyed drinking Chinese tea.





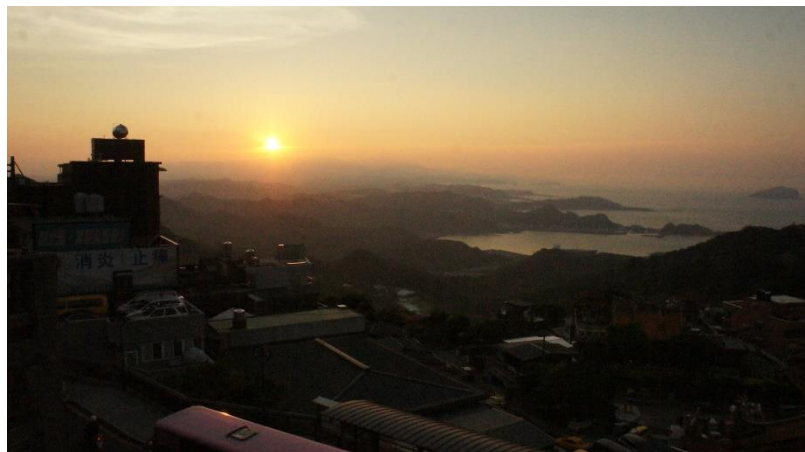
阿妹茶酒館 and the ornamented road



We can test taste

➤ **Landscape**

Shifun is beside the Pacific Ocean and it is on the mountainside so one can see the beautiful ocean from there.





- **Jiufun**

Actually, Jiufun is a small town, but many tourists visit there.

- **Sky lantern**

Because of the famous traditional event called the sky lantern festival. At the festival people make lantern with written wishes, and put fire on the bottom of the lantern to make it fly to the sky. Originally, the festival is held at the beginning of the year, but nowadays days we can make sky lanterns every season.

At the middle of the town there is the rail way and a main street is beside the railway. People make sky lanterns by rail and fly it while standing on the rail. Of course, trains sometime come to the rail, and then people need to get out from the rail. Train passes through just beside people and after it goes people go back to the rail.



- **Jiufun cascade**

Jiufun is mostly famous for its cascade. We can enjoy the fall from several points near the cascade. It was beautiful. However, we couldn't enjoy the powerful cascade enough, because there were few rains in Taiwan those days and the amount of the water was small.



Jiufun cascade

- **Taipei 101**

Taipei 101 is one of the highest buildings in the world. It is on the east part of the Taipei and from the view floor we can enjoy whole Taipei city. At night, the attraction becomes bigger. I visited Taipei 101 around the end of my Taiwan visiting. So I enjoyed looking for places where I had visited like NTUST, night markets, and so on. The building has high speed elevators and the huge damper ball. Most of us were student majoring technology, so we were interested in them and stopped for a long time to read the descriptions of the elevators and the damper. It was a wonderful place to visit.



**Damper ball, prevents Taipei101 shake by strong wind or Earth quakes**



**Taipei's Night from Taipei101**

### **Summary**

Overall the program was a valuable experience because we garnered a lot new knowledge in other engineering fields from both professors and fellow students while also improving our collaborative, management and presentation skills by interacting with people of different disciplines and cultures. We also got to learn more about the beauties of Taiwan and Asia at large. Through this program we were able to make a lot of new friends and build a wider network which would be valuable for our futures. Such kinds of programs are very valuable for development of oneself and students should be encouraged to participate in such programs at least once during their studies.