

# **Society of Automotive Engineers of Japan Kanto Branch Student Committee**

## **Student International Exchange Program in Taiwan 2018 Report (Web)**

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### **1. Purpose of SIEP in Taiwan**

In SIEP in Taiwan, we carried out the following activity.

- Visit to Taiwan's automotive companies and research institute
- Experience a lifestyle and a culture different from Japan
- Participate in conference
- Interaction with Taiwanese students

By learning about foreign technology and culture, we aim to develop the global viewpoint necessary for engineers and to improve the English language skills indispensable for globalization.

### **2. Schedule of SIEP in Taiwan**

Friday, November 30

- The 23rd National Conference on Vehicle Engineering & 2018 Technology of New Energy Automotives, Taiwan, R.O.C.

Saturday, December 1

- The 23rd National Conference on Vehicle Engineering & 2018 Technology of New Energy Automotives, Taiwan, R.O.C.
- Sanyi Wood Sculpture Museum
- Shangxing Train Station
- Night market

Sunday, December 2

- Arwin Rose & Jasmin-orange Forest Park
- Lavender Cottage Mingde, Miaoli Country
- Nanchuang Old Street
- Siiangtian Lake

Monday, December 3

- Maxxis Tires
- ARTC(Automotive Research & Testing Center)
- Lukang Old Street

Tuesday, December 4

- YULON MOTOR
- NOVEL TEK
- Dahu winery

Wednesday, December 5

- ITRI (Industrial Technology Research Institute)

Taiwanese students who cooperated in SIEP

- National Taipei University of Technology student
- Two National United University : Two students

### **3. Activity report**

**Friday, November 30 to Saturday, December 1**

#### **OSAE Conference**

We participated in " The 23rd National Conference on Vehicle Engineering & 2018 Technology of New Energy Automotives, Taiwan, R.O.C." held at National United University in Taiwan. In the same session as other participants, we presented our research to Taiwanese teachers, students, automobile related company's engineers, received valuable questions and opinions. Also, Taiwanese students' research presentation was good stimulus for us. Participation in NCVE-2018 gave us a valuable experience.



The state of presentation at NCVE-2018

### ○Sanyi Wood Sculpture Museum

Sanyi Wood Sculpture Museum is a museum that displays various wood carving products such as large furniture, statues, works of art, and daily items. Sanyi wood carving began to develop from the Japanese rule, and reached its heyday in the 1960s and 1970s, and raised several masters. Sanyi is still at the center of Taiwan's wood carving art, and is known as Taiwan's best wood carving village.



Group photo at Sanyi Wood Sculpture Museum

### ○Shangxing Train Station

Shangxing Train Station is the highest point of the Western Railway and is the Taichung line station of Taiwan Railway Administration Bureau that was once in Sanyi Township, Miaoli County, Taiwan and it is a famous tourist destination of Miaoli. It started again as a train station for tourism exclusive from June 5, 2010. The altitude is 402.326 meters above sea level, which is the region with the most natural scenery in the west railway.



The landscape of Shangxing Train Station

The station building of Shangxing Train Station is a wooden building with a Japanese style wooden structure and no single nail. It is said that the design called “Tiger Fang Style” has the effect of talisman.



Group photo at Shangxing Train Station

### ○Night Market

We visited the night market which is one of the Taiwanese culture in "Taichung Night Market". A row of local dishes and fruit stalls in Taiwan helped me to understand Taiwan's food culture. The atmosphere was close to Japanese festivals, and was very crowded with many people.



The landscape of Taichung Night Market

**Sunday, December 2**

### ○Arwin Rose & Jasmin-orange Forest Park

The first tourist destination visited the “Arwin Rose & Jasmin-orange Forest Park” which is one of the tourist factories of the Taiwanese cosmetics manufacturer “Arwin Gamon”. This maker deals with products that use the scent of roses. There was a rose garden free of charge in the site there, and we was able to walk while enjoying



the scent. The maker's cosmetics and clothes were sold at the shop attached to the factory.



Group photo at Arwin Rose & Jasmin-orange Forest Park

### ○Lavender Cottage Mingde, Miaoli Country

We visited "Lavender Cottage Mingde" located on the lake side of Mingde water box. The walls and paths in the garden where the lavender field spreads are produced with a humorous decoration, and many people such as local couples and families have visited as well as tourists.



The landscape of Lavender Cottage Mingde

### ○Nanchuang Old Street

"Nanchuang Old Street" is a shopping district with an old town with an atmosphere resembling Taipei's Jiuzhai.



### The landscape of Nanchuang Old Street

There were many buildings during the Japanese rule, and it was a friendly city for Japanese people. There, various foods such as meat, salmon, and sweets were sold, and the city was wrapped in a good smell.

### ○Siiangtian Lake

"Siiangtian Lake" is a lake with a border with Saisiat people. Siiangtian Lake is located in a natural rich forest, with clear air and a very healing place. A festival called "Pastaai" is held once every two years, and many people visit at the time.



The land scape of Siiangtian Lake



Group photo at Siiangtian Lake

### Monday, December 3

#### ○Maxxis Tires

Maxxis Tires is the top brand of the Cheng Shin Rubber group founded in 1991. Tire manufacturers for bicycles and motorcycles are the roots, and even now the annual production of bicycles and motorcycle tires is top class. Currently, it is a tire manufacturer boasting the

ninth largest share of the world, OEM to famous tire manufacturers is also done, and in 2014 they have obtained quality certification.

First, we visited the Maxxis tire manufacturing factory and the tire production line.

In the factory, safety control such as separation of areas of people and vehicles and automatic stop of machines at abnormality occurrence was thorough. Also, in the manufacturing process, raw materials are managed by barcodes, so that it is not possible to move the machine unless the barcode is scanned for each process, so it is possible to manufacture various products on the same line. We felt the height of production technology.

Next, we visited R&D center of head office. At the research and development center, various tire performance tests such as tire running noise tests in anechoic room and rolling resistance tests. The tire testing machine was able to change the wheel load and slip angle of the tire and the road surface was also capable of measuring two patterns of low  $\mu$  path and high  $\mu$  path. In the showroom of the R&D center, there were exhibits such as tires for military use, tires for bicycles, spiked tires for Russia, and we realized that they are a global company with high technology.

## ○ARTC

Established in 1990, the Automotive Research & Testing Center (ARTC) has developed to date as a venue for testing various vehicles in Taiwan. In the facility, there are extensive test courses, equipment such as crash test, anechoic room, etc. Also, they correspond to the approved car inspection of import cars.

ARTC currently conducts research mainly on intelligence safety, connected car and EV. Specifically, they are working on the development of products such as obstacle detection system, emergency brake system, EV non-contact charging system.

We visited the environmental test facility and the collision test facility as the experimental equipment of ARTC. In environmental test equipment, there were test machines assuming various situations such as dust testing machine, temperature testing machine, vibration testing machine, etc. They were conducting research on durability performance. It was impressive that many Japanese test machines were introduced. In the collision test facility, we were got an explanation about the dummy

doll used in the collision test. There are many dummy dolls from adult male size dummy dolls to child size dummy dolls. Various measuring instruments such as load cells and acceleration sensors are mounted to dummy doll for each state quantity measurement at the time of a collision, and we felt it again that collision test was a costly test.

Finally, we went to see a charging facility for EV vehicles. Charging plugs of EV vehicles were deployed that compatible with various standards, and it was compatible with the charge of EV vehicles of various countries. Among the chargers, there was a charger that stretched the charging cable from the vehicle side, not from the charger side, from the viewpoint of preventing theft. That was very interesting.

## ○Lukang Old Street

Lukang Old Street is Taiwan's most important business port for the Netherlands and the Qing Dynasty, and it prospered for commercial development there. Lukang Old Street has a Taoist temple called Lugang Mazu Temple. In this temple, Taiwanese students taught us Taoism explanation and how to visit, and we actually visited the temple with them. Many of the views on religion and how to visit were similar to Japanese Buddhism, but the decoration of Lugang Mazu Temple Palace was fancy and we felt a different culture strongly.

## Tuesday, December 4

## ○YULON MOTOR

Yulon Motor Co., LTD is an automobile manufacturer belonging to the Yulon Group in Taiwan, with headquarters in Miaoli Sanyi. They are a local partner of Nissan Motor in Taiwan and have produced Nissan Motor's product since the start of a technical alliance with Nissan Motor since 1957. They have launched "LUXGEN" as their luxury brand, started development and production since 2009.

In this SIEP in Taiwan, we visited the Miaoli Sanyi factory that is the head office factory, and the "Yulon Experience Center" just opened in August 2018. In the tour of the factory, we learned about the production technology of Yulon Motor. Yulon Motor has installed the production method of Nissan Motor, which enables the production of Nissan's vehicles and LUXGEN vehicles

on the same production line by sharing the production process. AGV (Automated Guided Vehicle) has been introduced for transporting parts in the factory, and automation of production has been proceeding. In the tour of Yulon Experience Center, we learned about the history of Yulon Motor and the manufacturing process of automobiles (press, painting, assembly etc.) from explanation panel, actual parts and products.



The state of explanation about painting at Yulon Experience Center

## ○NOVEL TEK

NOVEL TEK is a leading manufacturer in Taiwan which produces transport equipment founded in 1990. The overseas market accounts for 82% of NOVEL TEK's share, and their products are exported to 38 countries around the world. Japan is the largest market among them. NOVEL TEK's transportation equipment is powered not only by electricity but also by fuel cells. They said they want to promote fuel cell production in the future. Also, they have been considering automating transportation equipment in order to improve the production efficiency at the factory. The company's product called ATT-60SW is an AGV that performs automatic operation by detecting a line on the road surface, and it was used at the factory of Yulon Motor.



Group photo at NOVEL TEK

All products of NOVEL TEK are painted in red. This is due to their thoughts that they want to provide transportation equipment with a beautiful appearance like a passenger car. Through the company tour, we felt their strong preference to NOVEL TEK's products.

## ○Dahu winery

Dahu Township, Miaoli Country is a famous tourist spot for strawberry production. Currently, about 90% of the strawberries are produced there in Taiwan. This time, we visited Dahu winery (Dahu Strawberry Central Center) in Dahu Township. Dahu winery has souvenir shops of strawberry products (sweets, wines etc), shops of strawberry shaken ice, and a museum that conveys the history of Dahu Township and strawberries. The strawberry fields are spreading around Dahu winery, and we could get to know that Dahu Township is a famous production area of strawberries.



The state of explanation about Dahu Township

## Wednesday, December 5

### ○ITRI(Industrial Technology Research Institute)

Founded in 1973, Industrial Technology Research Institute (ITRI) is Taiwan's largest and one of the world's leading high-tech applied research institutions. It is committed to utilizing its R&D results to drive industrial development and create economic value. Since its inception, ITRI has incubated more than 270 startups and spinoffs, accelerating the growth of Taiwan's industry.

In response to rapid changes in the industrial environment, ITRI launched its Open Innovation System Platform (OISP) to enhance systems, software, and services, facilitating the convergence of multidisciplinary innovations. It has been promoting forward-looking



technological advances in three major application domains: Smart Living, Quality Health, and Sustainable Environment. Meanwhile, ITRI is dedicated to commercializing R&D achievements, cultivating exceptional talents, and providing comprehensive industrial services, business consultancy, and professional assistance of the open lab and incubation center.

#### **4. Summary**

Visit automobile-related companies and research institute and exchange with Taiwanese students in this SIEP are unique to this activities. And we learned many valuable stuff by participating in this activities. Through tours of Taiwan's automotive-related companies and research institute, we learned about technology in overseas. We felt that it is necessary to differentiate technologies and create added value in order to lead the world with technology because Taiwan has research facilities and test facilities equivalent to Japanese ones. Through exchanges with Taiwanese students, we learned about Taiwanese culture. The university life in Taiwan is not much different from that in Japan, but we could find out the difference with Japan such as taking breakfast with their family and friends at restaurants and cafes, and going to school by motorcycle. We could also have a great understanding of Taiwanese food culture and history thanks to polite explanation by Taiwanese students. And It was very stimulating to know student life and research activities of international students of the same generation. Communication in English was difficult, but we could have experience the pleasures of telling own thoughts in English. We would like to utilize well what we learned this time our future student life.

We would like to thank you to three Taiwanese students who guide us for a week and Prof. Kan-Lin Hsueh of the Department of Energy Engineering and everyone in the laboratory. We would also like to express our gratitude for SAE-Taipei who cooperated with SIEP and all members of companies and research institute who accepted our visits.