

International Internship Program
Report, 2014
Graduate school of Engineering
Mie University, Japan

From 1st April to 19th May, 2014

Faculty of Electrical Engineering

Kasetsart University, Thailand

Rapeepat Chumnuan

BIOGRAPHY



Name	Rapeepat Chumnuan
Nickname	Tide
Age	21
Year	3rd Student
Major	Power and Control
Faculty	Electrical Engineering
University	Kasetsart University
E-mail	rthaiza@gmail.com
Program	International Internship Program between Thai Partner Universities and Mie University

Acknowledgement

This program is a good program for me to find work experience. I joined this program because I want to learn the workings of the Japanese people, the discipline in organization, and also include the culture, economic and Japan is a modern technology. I work in electro mechanical systems laboratory in Mie university, MIE electronic and CKD corporation. Where I was working I got the new experience, the new social, and also the new inspiration to do the better thing in the future. And I have been here for 1 month and a half, I learned to lives of people here and I have known Japanese cultures. I would like to thanks Mie University and Kasetsart University who establish this course and gave me this great opportunity. Thank Member of Center for International education research (CIER) who manage and help about this program. And I thank Prof. Junji Hirai and his students, my colleague in CKD who help, teach and take care me as well. The end I thank all the people in Japan who help take care me. At any time that is here

Rapeepat Chumnuan

Introduction

Host professor Prof. Junji Hirai
My boss in CKD Mr. Yoshida Shigekazu
Tutor in CKD Mr. Katsuyuki Naganuma and his colleagues
Tutor in Mie Mr. Haruki Matsumoto and his friend
Duration From 1st April to 19th May, 2014
Place 1.) Graduate school of Engineering, Mie University
 2.) CKD Corporation, Head Plant (Komaki City), Japan
 3.) Mie Electronics Co., Ltd.



Graduate school of
Engineering Mie University



Head Plant/CKD Corporation
(Komaki City, Aichi Prefecture)



Mie Electronics Co., Ltd.
(Tsu City, Mie Prefecture)

Schedule for Internship program

- March 31, 2014

16.30 Arrive at Chubu Centrair International Airport, Nagoya by TG646

18.00 Arrive at Mie University Foreign Student' House

- April 1, 2014

09.00 Go to Center for International education research (CIER),
Mie University

13.00 Go to Graduate school of Engineering, Mie University

- April 2-18, 2014

**Join Internship Program of Graduate school of Engineering, Mie
University**

- April 18, 2014

14.00 Go to CKD at Komaki City, Aichi Prefecture

15.30 Arrive at CKD, introduce about CKD Corporation

17.00 Go to Ogawa Leoplace21 Apartment adjacent to the
Komakiguchi station.

- April 21- May14, 2014

Join Internship Program of CKD Corporation

- May14, 2014

Come back to Mie University for made report

- May16, 2014

last day for internship program at Mie University

- May19, 2014

17.25 Come back to TG647

Graduate school of Engineering, Mie University

While I belong to Graduate school of Engineering, Mie University. I'm internship in electro mechanical systems laboratory. Laboratory which have Prof. Junji Hirai is a professor. In this lab. I have studied the electrical controls such as motion control, sequence control And they also show me more R&D overview especially in motor and energy field underway in their laboratory.

In laboratory, I study and Programming PLC. Mr. Haruki teach me about Input contact, output contact, Timer, counter and internal relay, sequential function chart and other things.

I have been practiced simulated the traffic light signal control and I Programming PLC simulated the traffic light signal control.

I have been practiced simulated the elevators signal control and I Programming PLC simulated the elevator signal control.

They explained me about the Motion Control Technology which Motion Control Technology is very useful because can make moving objects as needed for example attitude control of the airplane, control system of paper, movement of ASIMO robot and other things.



Attitude control of the airplane
by Motion Control Technology



Control system of paper
by Motion Control Technology



Movement of ASIMO robot by
Motion Control Technology





I learn about PLC



I Programming PLC in laboratory



I have been practiced simulated the traffic light signal control



I have been practiced simulated the elevator signal control

They show me about R&D of them.

1.) Model-based controller design

Mr. Haruki and his friend explain me about Model-based controller design. process for Model-based controller design step1 Get the data of system step2 plot a frequency response step3 model of the control step4 design of the controller step5 control in real condition but step3 is cause modeling error between actual and formula. Their research by cutting step3 change step4 to step3, step5 to step4. find step3 design of the controller by PID design. Actual equipment such as tension and speed control system (multi-input-output system), inverted pendulum (gain scheduling control)

2.) Data-driven controller design

Mr. shogo explain me about data-driven controller design difference between model-based and data-driven is model-based controller have time

and effort is very long modeling but data-driven controller using design the controller parameters directly.

3.) reconfigurable robot.

Their research about Construction of fault-tolerant control system.

4.) Image Processing for Visual-Haptic Communication,

Their research develops an image processing method to reduce the delay caused by the visual data.

5.) Saving and Loading of Writing Motion in Three-dimensional Work Space which The aim of this research is to automate human's writing motion using a hard pen

6.) A study of a quick charger with highfrequency links using MC

In present quick charger is large-sized, high current and short time. Their study the possibility of improvement in charge efficiency and a miniaturization by using MC.

7.) Three phase four-wire Boost type Matrix Converter

Their theme focus on AC/AC Converter for stand-alone power source.

8.) Electrical power tracking controlmethod of small wind power generation system

9.) Generator of the small size wind power generating system

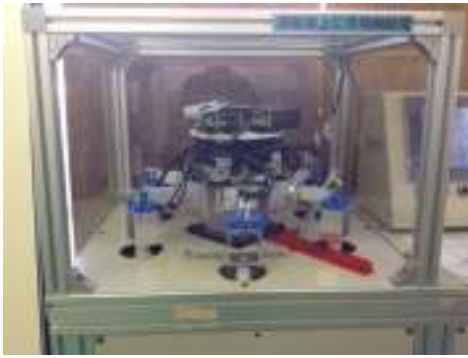
10.) Development of photovoltaic cell emulator using the small scale wind turbine

MIE ELECTRONICS CO.,LTD.

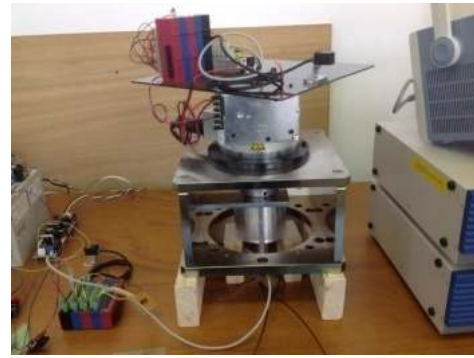
Mie Electronics is located near Mie university. It is not big company. Mr. Shuhei Takazakura is Mie Electronics is Manager and Mr. Toshikazu Mukai is assistant manager who become my trainer in this program at Mie Electronic.

I learn about 360' rotation table non-contract type and contract type. Which contract type complicated structure than non-contract type.

I learn about linear motor non-contract type and contract type. Which contract type complicated structure than non-contract type and contract type have belt.



360' rotation table contract type



360' rotation table non-contract type
product by CKD corporate

CKD Corporation, Head Plant (Komaki City), Japan

Corporate data

Establishment	April 2, 1943
Paid-in capital	11.016 billion yen
Number of employees	3,228 (as of March 31, 2011)
Annual sales	72.020 billion yen (as of March 31, 2011)
Stock exchange listing	First section of the Tokyo Stock Exchange and the Nagoya Stock, Exchange
Line of business	Development, manufacture, sales, and export of automatic machinery as well as functional components such as labor-saving components, pneumatic control components, pneumatic actuators, pneumatic components, fine system components, and fluid control component.

My work at CKD

In CKD corporation. I am working in electric actuator department. My boss is Mr. Yoshida Shigekazu. Mr. Katsuyuki Naganuma is my trainer in this program.

Their introduction me about Electric Actuator as ETS series, ESD series, ERL series, ESSD series, KBB series, KBZ series, KSA series etc. introduction about Direct drive actuator, Air bearing actuator, Indexman (Mechanical index).

I learn electric actuator ERL series, ESD series, ETS series, THK and HIWIN. ERL series, ETS series, THK, HIWIN is actuator slider type. ESD series is actuator rod type. I study structure of electric actuator

ERL/ESD series product by CKD corporate which have component is servo motor actuator (ERL/ESD series), controller, and teaching pendent. I study structure actuator ETS-10 series and I study difference of structure between actuator ETS-10 series, EST series and ESD series product by CKD corporation.

I assemble ERL/ESD series of CKD and operated teaching pendant control electric actuator ERL/ESD series.

I study and assemble actuator ETS-10 with servo motor product by Mitsubishi, Yaskawa, Panasonic and Omron.

I study and operate PCSOFT such as ASDA_SOFT of Delta servo motor drive, MELSOFT of Mitsubishi servo motor drive, Sigmawin+ of Yaskawa servo motor drive, Cx-one of Omron servo motor drive and Delta Engineer taught me to use operate ASDA_SOFT.

I research actuator ETS-10 with Delta and Mitsubishi servo motor. I check condition motor speed change acceleration constant and deceleration constant found Gain and motor speed is direct variation which actuator ETS-10 is smooth and not vibration, Delta and Mitsubishi servo motor is same condition. I check condition motor speed constant acceleration change and deceleration change found Gain and motor speed is reverse variation which actuator ETS-10 is smooth and not vibration, Delta and Mitsubishi servo motor is same condition. EST-10 smooth when FFT between 0-100.

Working experiences

- learn about Electric Actuator
- Servo motor practice
- Understand the Japanese working system such as be on time etc.
- Practice in industrial

Japan left

My accommodations in Japan

In Graduate school of Engineering, Mie University. I stay Mie University Foreign student' House, Room208. There are many students from abroad. I have Thai friend 3 person in dormitory. Sometime we have dinner together.

In CKD. I stay Ogawa Leoplac21 apartment. My apartment is adjacent to the Komakiguchi station, Komaki city, Aichi prefecture. I know

Japanese people in apartment. They help me in some matters if I need help.
Morning, I walked to work in CKD for 15 minutes and back in the evening.
I practiced garbage separation in dormitory and apartment.



My apartment at Komaki, Ogawa Leoplace21 apartment



Mie University Foreign student' House, Room208

Food

Japan is different foods from Thailand. They use chopsticks to eat and I use it for eating. Japan food I like Tonkatsu. I eat Tonkatsu very often. Sometimes I went shopping at Aeon for cook in the dormitory with my friend. lunch time in CKD 11.35-12.10 for April and 12.25-13.10 for May.



I like Japanese Food.



Some time I cook Thai food in dormitory.

Travel

In Japan. I travel by train and car. Mr. Haruki and his friend take me to Nara and Osaka city in holiday. Mr. Yamada In Nagoya I travel by train. And in different places, feel the difference. I like every place in Japan.



I travel by train and car.



I meet Thai friend in Japan.

PROBLEM

Sometime speaking different language makes a problem. But to me, it is not too trouble. And sometimes we used to write on paper for conversation. We enjoy using it therefore we can solve the problem together. Sometimes I stay in Nagoya alone. I have a problem with the Japanese lifestyle such as Japanese use for shopping and travel.

CONCLUSION

This program is very good opportunity for me to learn work in industrial and understand the Japanese working system, life style, cultures new social, new experience and also new inspiration. I think this program make me better thing in the future. I thank everyone involved with this program, both in Thailand and Japan.

Thanks you very much
Mr. Rapeepat Chumnuan
Faculty of Electrical Engineering
Kasetsart University, Thailand