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Eiji Kamioka

Technical Training on Information and Communication Technologies towards Industry4.0 Activation
--- Collaborative ICT training program with UPM, IITG and KLS GIT ---

Summary

This technical training program was held at Toyosu Campus, Shibaura Institute of Technology (SIT), from November 18 to November 27, hosted by Department of Information and Communications Engineering, College of Engineering. It was financially supported by JST (Japan Science and Technology Agency) Japan-Asia Youth Exchange Program in Science (SAKURA Exchange Program in Science), inviting 25 university students with 3 faculty members from Malaysia and India. From SIT, 46 students, nine faculty members, the president, four staff members of International Programs & Initiatives Section and four GSS (Global Students Staff) members participated in the program. It was a very large scale activity, involving 92 people with 11 nationalities in the program.

The program was mainly divided into three activities, which are AgPBL, Tutorials and Observation tour of research laboratories. AgPBL stands for "Advanced" Global PBL (Problem Based Learning). PBL is a teaching method in which students create ideas to solve a given problem and evaluate the ideas in a group discussion manner. AgPBL includes two additional aspects. Firstly, problems to be solved in the activity are not provided in advance, hence, students will find the problems existing in a specific topic. Secondly, the students will actually develop a system based on their ideas to show the feasibility and to evaluate the effectiveness. Through the AgPBL activity, the students will learn how to clarify research issues and how to acquire practical skills. These abilities are indispensable in engineering research. This viewpoint focusing on research is different from a general PBL. That is why this is called "Advanced" Global PBL. In this program, four tutorials with different topics, (1) IoT, (2) AI/Big data, (3) Multimedia and (4) Network Robot, were provided. Besides the tutorials, a research observation tour in which participants visited two Japanese research laboratories was conducted in order to acquire general knowledge about the topics.

The participants of this program were divided into 10 groups and each group achieved the mission, clarifying problems in a specific topic, proposing a system, developing the proposed system, evaluating the effectiveness and making the presentation with demonstration. Furthermore, the assessments of each participant's activity and achievement as a group were conducted on the final day.

In this program, two types of the AgPBL promotion video were produced. They will be uploaded to YouTube server after checking the adequacy of the content.

[Participants]

UPM: Universiti Putra Malaysia, Malaysia (16 people)

IITG: Indian Institute of Technology Guwahati, India (6 people)

GIT: KLS Gogte Institute of Technology, India (6 people)

SIT: Shibaura Institute of Technology, Japan (63 people)

1. Aims of program

AI, IoT, Big data and Robotics technologies are regarded as key technologies for the fourth industrial revolution (Industry4.0). Tackling with the decrease of working-age population in Japan, the implementation of Industry4.0 into our society is an urgent need, leading to Society5.0 (Cyber Physical Society). Cyber Physical Society is also called “Data-driven Society” in which three processes, (1) digital data acquisition, (2) intelligent data analysis and (3) control/service execution are cyclically operated, resulting in the intelligent society. In such a social requirement, the generation of technological innovations in ICT (Information and Communication Technologies) domain is indispensable. In this program, the participants will grasp how to effectively create new information and communication systems using ICT and how to implement the systems into the society, and finally will learn the research scheme to generate technological innovations.

2. Program at a glance

The participants from UPM, IITG and KLS GIT arrived in Japan on Nov. 18 in 2018. The program was conducted from Nov. 19 to Nov. 26, including the opening ceremony, ice-breaking, welcome party, AgPBL sessions, Tutorial sessions, cultural exchange activities, closing ceremony and farewell party. The participants from overseas departed from Japan on Nov. 27.

Table 1 Program at a glance

Date	A.M. (9:00–11:30)		PM (13:00–18:00)		
Nov. 18 (Sun)	-		Arrival at NRT (All)		
Nov. 19 (Mon)	Program Guidance + Opening ceremony	Ice-breaking (ORIGAMI) + Welcome party	AgPBL orientation	Tutorial session 1 (IoT/Multimedia content creation)	
Nov. 20 (Tue)	AgPBL session 1 (Brainstorming for theme decision)		Tutorial session 2 (AI/IoT security)	AgPBL session 2 (Scheduling of activity)	Cultural exchange 1 (YUKATA Workshop)
Nov. 21 (Wed)	AgPBL session 3 (System development)		AgPBL session 4 (System development)		
Nov. 22 (Thu)	Cultural exchange 2 (for visitors) Observation of NTT Laboratory		Cultural exchange 3 (for visitors) Observation of NICT Laboratory		
Nov. 23 (Fri)	AgPBL session 5 (System development)		AgPBL session 6 (System development)		
Nov. 24 (Sat)	AgPBL session 7 (System development)		AgPBL session 8 (System development)		
Nov. 25 (Sun)	Cultural exchange 4 (for visitors, optional) (Miraikan, etc.)		AgPBL session 9 (optional) (Preparation of presentation)		
Nov. 26 (Mon)	AgPBL session 10 (Preparation of presentation)		AgPBL session 11 (Presentation with demonstration)		Closing ceremony + Farewell party
Nov. 27 (Tue)	Departure from NRT (IITG, GIT)		Departure from NRT (UPM)		

3. Details of program

(1) Welcoming participants at Narita

15 students and Dr. Azizol Bin Abdullah from UPM, 5 students and Assist. Prof. Charu Monga from IITG and 5 students and Assoc. Prof. Swetha Indudhar Goudar from KLS GIT arrived at Narita International Airport on Nov. 18, 2018. Prof. Kamioka, Adjunct Assoc. Prof. Assoc. Prof. Khaironi Yatim Sharif and three GSS (Global Student Staff) members exchanged greetings with them and took them to Hotel Ann Tsukiji.



Fig. 1 Participants from UPM, IITG and KLS GIT arrived at Narita

(2) Program guidance and opening ceremony

Three GSS members brought 28 participants from UPM, IITG and KLS GIT to Toyosu campus from their hotel. Firstly, the program guidance was carried out by Ms. Mayuko Sudo from International Programs & Initiatives Section, instructing how to use Guest ID-card, campus Wi-Fi, and so forth. Subsequently, the opening ceremony started, where the president Prof. Dr. Masato Murakami gave an address of welcome, the representative of each university made a brief talk and the introduction of Faculty members of Department of Information and Communications Engineering was conducted.



Fig. 2 Program guidance and welcome address by the president, Prof., Dr. Masato Murakami



Fig. 3 Making brief talks by Dr. Khaironi Yatim Sharif from UPM (also SIT Adjunct Assoc. Prof.), Assist. Prof. Charu Monga from IITG and Assoc. Prof. Swetha Indudhar Goudar from KLS GIT



Fig. 4 Participants group photo in the opening ceremony

(3) Ice-breaking

After the opening ceremony, Ice-breaking was conducted to become better acquainted with each other by performing “ORIGAMI” which is a traditional Japanese crafting. One of SIT graduate students explained the procedure in video instructions. Basically, Japanese students taught international students how to make ORIGAMI crafts. This was a good exercise for Japanese students to make English conversations.



Fig. 5 Ice-breaking: Teaching how to make ORIGAMI crafts through English conversations

(4) Welcome party

Welcome-party was held at 3F GLC (Global Learning Commons). HALAL and Vegetarian foods were catered from a restaurant.



Fig. 6 Welcome party at 3F Global Learning Commons

(5) Tutorials

Four tutorials related to the AgPBL topics were given to the participants. The titles were “IoT”, “how to create attractive video content”, “AI technology – machine learning –“ and “IoT security”. The lecturers were Assis. Prof. Phan Xuan Tan from SIT, Assist. Prof. Charu Monga from IITG, Prof. Yuchi Kanzawa from SIT and Dr. Azizol Bin Abdullah from UPM.



Fig. 7 Four tutorials were given by Assis. Prof. Phan Xuan Tan, Assist. Prof. Charu Monga, Prof. Yuchi Kanzawa and Dr. Azizol Bin Abdullah

(6) AgPBL session – Brainstorming -

At the beginning of AgPBL, each group did a brainstorming about the topic in order to clarify the problems. This process is the most important for “Advanced” Global PBL.



Fig. 8 Brainstorming in AgPBL session to clarify the problems on the topic

(7) YUKATA workshop

YUKATA workshop was performed at 3F Global Learning Commons as a cultural exchange. Both International and Japanese students really enjoyed wearing YUKATA and taking their photos.



Fig. 9 YUKATA workshop at 3F Global Learning Commons

(8) Observation tour of research laboratories

Research observation tour was conducted as a cultural exchange. Participants visited two Japanese research laboratories, which are NTT and NICT research laboratories, in order to acquire general knowledge about the AgPBL topics.



Fig. 10 Observation tour for NTT and NICT research laboratories

(9) AgPBL session – System development -

Each group developed the system based on the proposal to show the feasibility and to evaluate the effectiveness.



Fig. 11 System development in AgPBL session

(10) Final presentation

Presentation session of AgPBL was conducted to evaluate their achievements. Each group made a presentation with demonstration videos. The achievement was assessed by faculty members and the best achievement award was decided.



Fig. 12 Final presentation was conducted and BEST Achievement Award was decided

(11) Closing ceremony

In the closing ceremony, all the participants got the certificate which show they completed this program. In addition, BEST Achievement Award was also given.



Fig. 13 Certificate of completion and BEST Achievement Award were given in the closing ceremony

Appendix A: Participants list

University	Grade	Name	Nationality	Laboratory
GIT	Faculty member	Assoc. Prof. SWETHA INDUDHAR GOUDAR	India	—
	B2	ADITYA THAKKAR	India	
	B2	AMOGH HUILGOL	India	
	B2	ANAY KULKARNI	India	
	B2	BADRINATH MADHAV KULKARNI	India	
	M1	SAMARTH PRAKASHRAO KULKARNI	India	
IITG	Faculty member	Assist. Prof. CHARU MONGA	India	—
	M2	BITOPAN KALITA	India	
	M2	BHAVNA NAGPAL	India	
	B4	VINIT GARG	India	
	M1	THONGAM DEBIKA DEVI	India	
	B3	ANIKET MANISH MANDLE	India	
UPM	Faculty member	Dr. AZIZOL BIN ABDULLAH	Malaysia	—
	D2	FARA BINTI JAMAL	Malaysia	
	D2	MD SAIFULLAH BIN RAZALI	Malaysia	
	D4	SITI SUHAILA BINTI ABDUL HAMID	Malaysia	
	D2	ENG KAI LUN	Malaysia	
	M3	MOHAMMAD ALIF BIN MOHAMMAD ALLAUDIN	Malaysia	
	D1	FAZLINA BINTI MOHD ALI	Malaysia	
	D3	GUNAVATHI DURAISAMY	Malaysia	
	D3	JOHANNA BINTI AHMAD	Malaysia	
	D3	SITI NURLIANA BINTI JAMALAI	Malaysia	
	D2	MUHAMMAD NAJIB BIN RAMLEE	Malaysia	
	D2	MUHAMAD SUFRI BIN MUHAMMAD	Malaysia	
	D1	SITI DHALILA BINTI MOHD SATAR	Malaysia	
	M2	NUR FATIN BINTI MOHD HAMRAN	Malaysia	
	M1	ATHIMAHENDRAN PANNEERSELVAM	Malaysia	
M1	HAZURAINI BINTI MOHD SUFFIAN SOO	Malaysia		

University	Grade	Name	Nationality	Laboratory
SIT	President	Prof. Dr. Masato Murakami	Japan	—
	Faculty members	Prof. Dr. Eiji Kamioka	Japan	—
		Prof. Dr. Koichi Gyoda	Japan	
		Prof. Dr. Yuchi Kanzawa	Japan	
		Prof. Dr. Syuji Kubota	Japan	
		Assoc. Prof. Dr. Hiroaki Morino	Japan	
		Assoc. Prof. Dr. Ryota Horie	Japan	
		Assoc. Prof. Dr. Sumiko Miyata	Japan	
		Assist. Prof. Dr. Phan Xuan Tan	Vietnam	
	Adjunct. Assoc. Prof. Dr. Khaironi Yatim Sharif	Malaysia		
	D3	Mohamad Sabri Bin Sinal	Malaysia	Kamioka Lab.
	D1	Manami Kanamaru	Japan	
	M2	Kahil Mustafa Jamal Salem	Saudi Arabia	
	M2	Alharbi Fahad Abdulkarim DhaifAllah	Saudi Arabia	
	M2	Alharbi Abrar Abdullah DhaifAllah	Saudi Arabia	
	M2	Othmar Othmar Mwambe	Tanzania	
	M2	Fatin Amanina Ahmad Tarmizi	Malaysia	
	M1	Yuhi Kaihoko	Japan	
	M1	Yoshihiro Nagano	Japan	
	M1	Zhang Jiaqi	China	
	M1	Min Hyun Ki	Korea	
	M1	Tran Minh Chanh	Vietnam	
	M1	Nguyen Duc Tho	Vietnam	
	B4	Shota Kawana	Japan	
	B4	Kei Koyama	Japan	
	B4	Yamato Okada	Japan	
	B4	Erika Kojima	Japan	
	B4	Kodai Tsukahara	Japan	
	B4	Zheng Weijia	China	
	B4	Kosuke Murata	Japan	
	B4	Ryohei Morikawa	Japan	
	B4	Daiki Yamakami	Japan	
	D3	Muhammad Luqman Bin Mahamad Zakaria	Malaysia	
D1	Omuwa Oyakhire	Nigeria	Gyoda Lab.	
M2	Tadahiro Sano	Japan		
M2	Shinichi Furusawa	Japan		
M1	Masato Abe	Japan		
M1	Kiichi Ishijima	Japan		
M1	Satoru Inazu	Japan		
M1	Ryoma Sato	Japan		
B4	Hiroaki Ueno	Japan		
B4	Yota Uchimura	Japan		
B4	Tadaaki Kuramoto	Japan		
B4	Ryosuke Suzuki	Japan		
B4	Naoki Nemoto	Japan		
B4	Norihisa Watanabe	Japan		
B4	Hiroshi Watanuki	Japan		
M2	Masaki Nishizaka	Japan	Morino Lab.	
M1	Yuki Shibuya	Japan		
B4	Satoshi Watanabe	Japan		
M1	Shohei Kobayashi	Japan	Horie Lab.	
B4	Kouhei Sato	Japan		
B3	Kazuki Ito	Japan		
M1	Hiroshi Shibayama	Japan	Miyata Lab.	
B4	Naoto Suzuki	Japan		
B3	Serika Yamamoto	Japan		
International Programs & Initiatives Section	Ms. Mayuko Sudo	Japan	—	
	Mr. Takaaki Toguchi	Japan		
	Ms. Keiko Kaneko	Japan		
	Ms. Reiko Kageyama	Japan		
GSS	Muhammad Ilham Perkasa	Indonesia	—	
	Gustavo Akira Gondo	Brasil		
	Wang Ziyang	China		
	Kengo Yamamoto	Japan		

Appendix B: Assessment sheet for participants

Advanced Global PBL Assessment Sheet

Pre AgPBL: November 19, 2018
Post AgPBL: November 26, 2018

Group No.: University (GIT/IITG/UPM/SIT): **Name:** _____

Personal outcomes

Assessment by yourself and peer students (High: 5, 4, 3, 2, 1 : Low)

Learning Outcomes	Competency	Self Assessment		Peer #1		Peer #2		Peer #3		Peer #4		Peer #5		Peer #6		Peer #7		Peer #8		
		Pre AgPBL	Post AgPBL	Student Name																
General Communication	Speaking and listening skills in a group discussion																			
Information Retrieval	Searching skill to understand unknown information																			
Problem Presentation	Ability of clarifying problems in current technologies																			
Solution Proposal	Ability of creating new ideas to solve problems																			
Leadership	Ability of managing group members to conclude discussions																			

Group Outcomes

Assessment by yourself (High: 5, 4, 3, 2, 1 : Low)

Project Outcomes	Description	Self Assessment	
		Pre AgPBL	Post AgPBL
Creativity	Novelty of proposal		
Effectiveness	Usefulness of proposal		
Completion	Perfection in solving problems		
Feasibility	Technically, socially and economically feasible		
Presentation	well-organized and convincing presentation		

What you have learnt from the AgPBL

Comments and Suggestions on the AgPBL

Appendix C: Assessment sheet for presentations

Evaluation Sheet for Advanced Global PBL Presentation

Nov. 26, 2018

Group No.: _____ University (GIT/IITG/UPM/SIT): _____ Name: _____

Evaluation (High: 5, 4, 3, 2, 1 : Low)

Group No.	Topic of AgPBL discussion	Creativity		Effectiveness	Completion	Feasibility	Presentation
		Novelty of proposal	Usefulness of proposal				
Group 1						Technically, socially and economically feasible	Well-organized and convincing presentation
Group 2							
Group 3							
Group 4							
Group 5							
Group 6							
Group 7							
Group 8							
Group 9							
Group 10							

Comments: