



2019 Asia Pacific Information Technology Conference

# **2019 Asia Pacific Information Technology Conference (APIT 2019)**

**January 25-27, 2019**

**Jeju Island, South Korea**

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<http://www.apit.net>



## **Welcome Message from Organizing Committee**

It is our great pleasure to invite you to join our international conferences - 2019 Asia Pacific Information Technology Conference (APIT 2019). This event will provide a unique opportunity for editors and authors to get together and share their latest research findings and results. We look forward to welcoming you at Jeju, South Korea.

We're confident that over the two days you'll get the theoretical grounding, practical knowledge, and personal contacts that will help you build long-term, profitable and sustainable communication among researchers and practitioners working in a wide variety of scientific areas with a common interest in Information Technology.

On behalf of all the conference committees, we would like to thank all the authors as well as the technical program committee members and reviewers. Their high competence, their enthusiasm, their time and expertise knowledge, enabled us to prepare the high-quality final program and helped to make the conference become a successful event.

We truly hope you'll enjoy the conference and get what you expect from the conference.

Organizing Committee  
January 25, 2019

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# Conference Introductions

Welcome to 2019 APIT Jeju Island conference. This conference is organized by ACM Chapter Singapore. The objective of the Singapore conference is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Information Technology.

**Papers will be published in the following proceeding:**

International Conference Proceedings Series by ACM (ISBN: 978-1-4503-6621-2), which will be archived in the ACM Digital Library, and indexed by Ei Compendex, Scopus and submitted to be reviewed by Thomson Reuters Conference Proceedings Citation Index (ISI Web of Science).

**Conference website and email:** <http://www.apit.net> and [apit.conference@gmail.com](mailto:apit.conference@gmail.com)

## Conference Venue



### Hotel Regent Marine the Blue

Add: 20, Seobudu 2-gil, Jeju-si, Jeju-do, 63276, Korea



Located in front of Tap-dong Square just a 15-minute drive from Jeju International Airport, Regentmarine The Blue features a 24-hour front desk with currency exchange service, an outdoor swimming pool as well as business meeting facilities. WiFi is offered throughout the entire property, free of charge. Guests will also find free on-site private parking.

The property swimming pool is on the 3rd floor and offers stunning ocean views. There is a convenience store on site. The hotel also features a banquet hall and a business meeting room with high-speed wired and wireless internet, featuring a whiteboard, microphone and a sound system. Breakfast, brunch and light meals are offered at dinner time at restaurant Latif, located on the ground floor of the hotel.

Jeju Port International Ferry Terminal and Jeju Intercity Bus Terminal are both 10-minutes by car, while Yongduam Dragon Head Rock is a 5-minute drive to the west. Samyang Black Sand Beach is a 20-minute drive to the east.

Jeju City is a great choice for travelers interested in mountains, friendly locals and sightseeing. This hotel is also rated as the best value in Jeju!

# Registration Guide

**January 25, 2019 (Friday)**

**Time: 11:00~17:00**

**Venue: Lobby of Hotel Regent Marine The Blue**

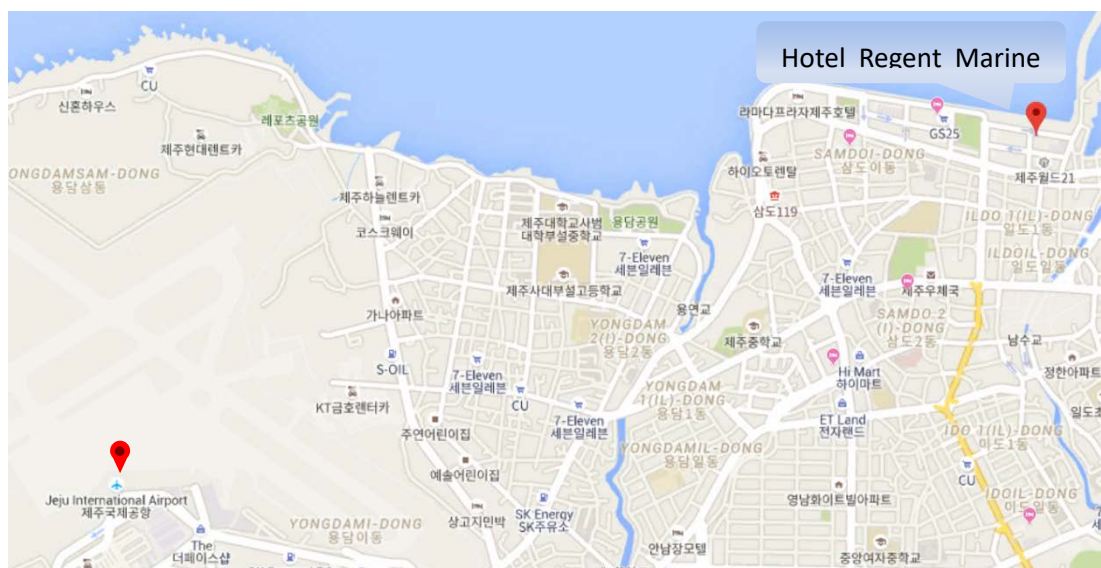
## Registration Steps

1. Arrive at the Lobby of Hotel Regent Marine The Blue;
2. Inform the conference staff of your paper ID;
3. Sign your name on the Participants list;
4. Sign your name on Lunch & Dinner requirement list;
5. Check your conference kits: (1 conference program, 1 lunch coupon, 1 dinner coupon, 1 receipt, 1 name card, 1 flash disk, 1 laptop bag);
6. Finish registration.

**Tips:** Please arrive at the conference to upload or copy PPT into the laptop room 10 minutes before the session begins.

### Note:

- (1) The organizer doesn't provide accommodation, and we suggest you make an early reservation.
- (2) One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on January 26, 2019.
- (3) One day tour includes lunch but does not include attractions tickets, and participants need to take care of themselves.





# **Presentation Instructions**

## **Instructions for Oral Presentations**

### **Devices Provided by the Conference Organizer:**

Laptop Computer (MS Windows Operating System with MS PowerPoint and Adobe Acrobat Reader)  
Digital Projectors and Screen  
Laser Sticks

### **Materials Provided by the Presenters:**

PowerPoint or PDF Files (Files should be copied to the Conference laptop at the beginning of each Session.)

### **Duration of each Presentation (Tentatively):**

Regular Oral Presentation: about 12 Minutes of Presentation and 3 Minutes of Question and Answer

## **Instructions for Poster Presentation**

### **Materials Provided by the Conference Organizer:**

The place to put poster

### **Materials Provided by the Presenters:**

Home-made Posters  
Maximum poster size is A1  
Load Capacity: Holds up to 0.5 kg

## **Best Presentation Award**

One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on January 26, 2019.

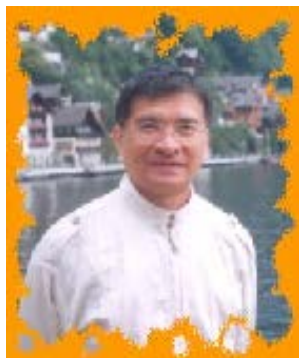
## **Dress code**

Please wear formal clothes or national representative of clothing.



# Keynote Speakers Introductions

## Keynote Speaker I



**Prof. Chin-Chen Chang**

Feng Chia University, Taiwan

**Prof. Chin-Chen Chang** obtained his Ph.D. degree in computer engineering from National Chiao Tung University. He's first degree is Bachelor of Science in Applied Mathematics and master degree is Master of Science in computer and decision sciences. Both were awarded in National Tsing Hua University. Dr. Chang served in National Chung Cheng University from 1989 to 2005. His current title is Chair Professor in Department of Information Engineering and Computer Science, Feng Chia University, from Feb. 2005.

Prior to joining Feng Chia University, Professor Chang was an associate professor in Chiao Tung University, professor in National Chung Hsing University, chair professor in National Chung Cheng University. He had also been Visiting Researcher and Visiting Scientist to Tokyo University and Kyoto University, Japan. During his service in Chung Cheng, Professor Chang served as Chairman of the Institute of Computer Science and Information Engineering, Dean of College of Engineering, Provost and then Acting President of Chung Cheng University and Director of Advisory Office in Ministry of Education, Taiwan.

Professor Chang's specialties include, but not limited to, data engineering, database systems, computer cryptography and information security. A researcher of acclaimed and distinguished services and contributions to his country and advancing human knowledge in the field of information science, Professor Chang has won many research awards and honorary positions by and in prestigious organizations both nationally and internationally. He is currently a Fellow of IEEE and a Fellow of IEE, UK. On numerous occasions, he was invited to serve as Visiting Professor, Chair Professor, Honorary Professor, Honorary Director, Honorary Chairman, Distinguished Alumnus, Distinguished Researcher, Research Fellow by universities and research institutes. He also published over 1,100 papers in Information Sciences. In the meantime, he participates actively in international academic organizations and performs advisory work to government agencies and academic organizations.

## Keynote Speaker II



**Prof. Yong Jin Park**

University Malaysia Sabah, Malaysia

**Prof. Yong Jin Park** received B.E., M.E., and Ph.D. degrees in Electronic Engineering from Waseda University, Tokyo. From 1978 to 2010, he was a Professor at Hanyang University, Seoul. He was also a Professor of Waseda University, Tokyo, during 2010-2016. He joined University Malaysia Sabah in 2016, where he is now a Professor of Faculty of Computing and Informatics. In addition, he was a Visiting Associate Professor from 1983 to 1984 in the Department of Computer Science, University of Illinois, Urbana-Champaign, and a Research Fellow at the Computing Laboratory, University of Kent, England, from 1990 to 1991. He joined to deploy Research & Development Network in Korea from the early stage in 1980s. Furthermore, he was one of founding members of the Open Systems Interconnection Association, which promoted standardization activities of communication networks in Korea, and the President from 1991 to 1992. He was the Chairman of the IEEE Seoul Section from 1999 to 2000 and the President of the Korea Institute of Information Scientists and Engineers (KIISE) in 2003. As international academic activities, he was the Director of the Secretariat of the Asia Pacific Advanced Network (APAN) from 1999 to 2003 and the Director of IEEE Region 10 concurrently holding a member of IEEE Board of Directors from 2009 to 2010. He served successively various IEEE committees such as Nominations and Appointment Committee, Conference Committee, Public Visibility Committee, and Ethics & Member Conduct Committee, and is now a member of Life Member Committee, Service Award Committee, Theodore W. Hissey Outstanding Young Professional Award Committee member, and Teaching Award Committee in IEEE as well as IEEE Region 10 Nominations & Advisory Committee. Currently he is a Professor Emeritus of Hanyang University and IEICE fellow. His research interest is the area of Computer Networks, especially Future Internet Architectures.

## Keynote Speaker III



**Prof. Tatsuya Yamazaki**  
Niigata University, Japan

**Prof. Tatsuya Yamazaki** received the B.E., M.E. and Ph.D. degrees in information engineering from Niigata University, Niigata, Japan, in 1987, 1989 and 2002, respectively. He joined Communications Research Laboratory (at present, National Institute of Information and Communications Technology) as a researcher in 1989. Since August 2013, he has been with the Faculty of Engineering, Niigata University, Niigata, where he is currently a Professor. Currently, he is also the director at the Big Data Activation Research Center of Niigata University. From 1992 to 1993 and 1995 to 1996 he was a visiting researcher at the National Optics Institute, Canada. From 1997 to 2001 he was a senior researcher at ATR Adaptive Communications Research Laboratories. His research interests include pattern recognition, statistical image processing, sensing data analysis, and communication service quality management. He served as general co-chair of IEEE Workshop on Knowledge Media Networking (KMN'02) and general chair of the 5th International Conference On Smart Homes and Health Telematics (ICOST 2007). He is a member of the IEEE, the Institute of Electronics, Information and Communication Engineers, the Information Processing Society of Japan, the Institute of Image Information and Television Engineers, and the Japanese Society for Artificial Intelligence.

## Schedule for Conference

January 25, 2019 (11:00-17:00)		
11:00-17:00	<b>Arrival and Registration</b>	Lobby
January 26, 2019 (9:20-17:30)		
9:20-9:30	<b>Opening Remark:</b> Prof. Yungcheol Byun, Jeju National University, South Korea	Regent Room
9:30-10:10	<b>Keynote Speech I:</b> <b>Title: A Steganographic Algorithm Based on (7,4) Hamming Code</b> Prof. Chin-Chen Chang, Feng Chia University, Taiwan	Regent Room
10:10-10:50	<b>Keynote Speech II:</b> <b>Title: Information-Centric Networking and its prospects for IoT and 5G</b> Prof. Yong Jin Park, University Malaysia Sabah, Malaysia	Regent Room
10:50-11:20	<b>Coffee Break &amp; Group Photo</b>	Regent Room
11:20-12:00	<b>Keynote Speech III:</b> <b>Title: Ubiquitous Sensing: from Home to Farm</b> Prof. YAMAZAKI Tatsuya, Niigata University, Japan	Regent Room
12:00-13:00	<b>Lunch</b>	Restaurant Latif
13:00-15:30	<b>Session I: Information System Design and Visualization Technology</b> Session Chair: Prof. Yong Jin Park	Regent Room
15:30-16:00	<b>Coffee Break</b>	Regent Room
16:00-18:00	<b>Session II: Computer and information security</b> Session Chair: Prof. YAMAZAKI Tatsuya	Regent Room
10:50~16:00	<b>Poster session</b> Session Chair: Prof. Chin-Chen Chang	Regent Room
18:00-19:00	<b>Dinner</b>	Restaurant Latif
January 27, 2019 (9:00-17:00)		
9:00-17:00	<b>One-Day Tour</b>	



2019 Asia Pacific Information Technology Conference

## Morning Session

**Morning, January 26, 2019 (Saturday)**

**Time: 9:20~12:00**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Opening Remarks (9:20~9:30)**

Addressed by **Prof. Yungcheol Byun** from Jeju National University in South Korea

**Dr. Yungcheol Byun** is a full professor at the Computer Engineering Department (CE) at Jeju National University (<http://www.jejunu.ac.kr>). His research interests include the areas of Pattern Recognition & Image Processing, Artificial Intelligence & Machine Learning, Pattern-based Security, Home Network and Ubiquitous Computing, u-Healthcare, and RFID & IoT Middleware System. He directs the Machine Laboratory at the CE department. Recently, he studied at University of Florida as a visiting professor from 2012 to 2014. He is currently serving as a director of Information Science Technology Institute, and other academic societies. Outside of his research activities, Dr. Byun has been hosting international conferences including CNSI (Computer, Network, Systems, and Industrial Engineering), ICESI (Electric Vehicle, Smart Grid, and Information Technology), and serving as a conference and workshop chair, program chair, and session chair in various kinds of international conferences and workshops. Dr. Byun was born in Jeju, Korea, and received his Ph.D. and MS from Yonsei University (<http://www.yonsei.ac.kr>) in 1995 and 2001 respectively, and BS from Jeju National University in 1993. Before joining Jeju National University, he worked as a special lecturer in SAMSUNG Electronics (<http://www.samsung.com>) in 2000 and 2001. From 2001 to 2003, he was a senior researcher of Electronics and Telecommunications Research Institute (ETRI, <https://etri.re.kr/eng/main/main.etri>). He was promoted to join Jeju National University as an assistant professor in 2003.



2019 Asia Pacific Information Technology Conference

# Morning Session

Morning, January 26, 2019 (Saturday)

Time: 9:20~12:00

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Keynote Speech I (9:30~10:10)**

A Steganographic Algorithm Based on (7,4) Hamming Code

**Prof. Chin-Chen Chang**

Feng Chia University, Taiwan

*Abstract*—Diverse data hiding schemes have been proposed in recent decades. Among them, data hiding schemes in the compressed domain have attracted more attention since the compressed image format is one of the most frequently transmitted formats over the Internet. Specifically, among various compression algorithms, Absolute Moment Block Truncation Coding (AMBTC) is a good choice due to its low complexity and acceptable distortion. In this talk, I will introduce a novel data hiding method using (7, 4) Hamming code to conceal secret data into AMBTC compressed bit-stream. Experimental results show that this scheme outperforms the other four existing BTC-based data hiding approaches in terms of embedding capacity, bit rate, and hiding efficiency.

# Morning Session

**Morning, January 26, 2019 (Saturday)**

**Time: 9:20~12:00**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Keynote Speech II (10:10~10:50)**

Information-Centric Networking and its prospects for IoT and 5G

**Prof. Yong Jin Park**

Faculty of Computing and Informatics, University Malaysia Sabah, Malaysia

*Abstract*—Information Centric Networking (ICN) has been being inspired as a promising future Internet architecture. The recent network usage has changed from host-centric to information-centric. ICN accesses information by using its object name, instead of a location address such as IP address. This revolutionary paradigm makes ICN a promising network architecture, as it also provides content-based security and in-network data caching. This talk includes the background and technological features of ICN as well as its latest research development. As its prospects, it is shown that ICN makes a good fit for a wide range of IoT applications and that the flexibility of 5G next generation architecture facilitates adopting ICN as one of their network architectures.



**Coffee Break & Group Photo Taking 10:50~11:20**

# Morning Session

**Morning, January 26, 2019 (Saturday)**

**Time: 9:20~12:00**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Keynote Speech III (11:20~12:00)**

Ubiquitous Sensing: from Home to Farm

**Prof. YAMAZAKI Tatsuya**

Niigata University, Japan

*Abstract*—Ubiquitous computing is a concept where computing can occur using any device, in any location, and in any format. Recently, computing devices become smaller and smaller as well as computing resources are easily available thanks to cloud computing technologies. Thus we are already encompassed by the ubiquitous computing pervasively. Consequently, services or applications that make use of context are easily able to realize; that is so-called context-aware services.

Realization of the context-aware services under the ubiquitous computing environments owes to sensing technologies and data analysis. Sensors have a role to connect a cyber space and a physical space, because they can measure object location data and environmental data in the physical space that are utilized for further computing and analysis. Therefore, the ubiquitous computing research focusing on the sensing technologies is called the ubiquitous sensing in this context.

In this speech, two applications of the ubiquitous sensing are introduced. The first application is a context-aware application in home environment. We constructed a real-life test bed, called the "ubiquitous home," for home context-aware service experiments. It was a housing test facility where devices, sensors and appliances were linked by means of a data network. a basic definition of context is proposed and implementation of context-aware services in a real-life test bed is presented. A couple of husband and wife experimented context-aware services for 16 days in this test bed. The second application is construction of a ubiquitous sensing environment in a real fruit planting field. Since ICT (information and communications technology) has not permeated into every farmer, many farmers considerably depend on his/her experience and intuition to grow farm products. Namely, it is implicit context-awareness. We are introducing several kinds of sensors in a field of pears trees to make the implicit context explicit and visible.



**Lunch**

**12:00~13:00**

**Venue: Restaurant Latif, 1st Floor, Hotel Regent Marine The Blue**



# Oral Presentation Abstracts

## Session 1- Information System Design and Visualization Technology

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 13:00-15:30**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. Yong Jin Park**

**AP0011** Presentation 1 (13:00~13:15)

Customer Intelligence on Customer Retention

**Marylene Eder**

Asian Institute of Technology, Thailand

*Abstract*—Customer retention offers many benefits but despite of the importance of retention to business profitability, it was found out that generally appear, financial institutions not to have fully embraced the retention concept, practices and strategies (6). As cited from previous studies that across industries it is more expensive to acquire new customers than to retain the existing one. It is critical to company's decision makers how they go about it in order to retain customers as it increases sales. The researcher used a dummy public dataset from telco company for simulation and it has been analyzed using different machine learning techniques. Based on the findings, logistic regression and random forest techniques are recommended as both gave the best accuracy. Logistic regression achieved the highest score for accuracy approximately 79.1 % followed by random forest 78.5 % accuracy, Naïve Bayesian 74.3% and Decision Trees 73.5%. Furthermore, other performance metrics: AUC and ROC were presented for performance evaluation. Therefore, the study concluded that there is a significant relationship between customer retention and customer intelligence. Customer Intelligence are being introduce to the companies that help in producing insight into customers that is not only smart but useful and crucially about action. It helps the company to stay competitive, and understand exactly what their customers want and expect from the company and holds tremendous value by knowing customers' preferences that serve as vital driving sales. But far beyond that, customer intelligence has the potential to reveal new demand, additional profit centers, new tools and open up an avenue to increase the number of retaining customers rather than customer attrition.

## Session 1

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 13:00-15:30**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. Yong Jin Park**

**AP0031** Presentation 2 (13:15~13:30)

Visual Perception Games for Autistic Learners: Design & Development

**Che Ku Nuraini Che Ku Mohd**, Faaizah Shahbodin and Azni Haslizan Ab Halim

Universiti Teknikal Malaysia Melaka, Malaysia

*Abstract*—The use of information communication technologies (ICTs) in therapy offers new perspectives for treating many domains in individuals with autism spectrum disorders (ASD) because it is used in many different ways and settings and they are attractive to the patients. Students with autism have a high incidence of visual perception problems. They often have difficulty recognizing, remembering, organizing and interpreting visual images. As a result, they are easily confused in situations that involve using written or pictorial symbols for learning. The paper report the design and development autism diagnostic tool using serious games technique. It is a tool for special education teachers to diagnose visual perception problems among autistic students. The game is called as Vi-Per Games. A diagnostic tool known as Vi-Per Games was developed based on ADDIE model. Vi-Per Games was able to diagnose autistic students without the needs for teachers to have some experience and knowledge of diagnosing visual perception. This prototype will be a high-tech solution to diagnose visual perception problems designed for autistic children.



## Session 1

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 13:00-15:30**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. Yong Jin Park**

**AP0040** Presentation 3 (13:30~13:45)

Analytical visualization of higher education institutions' big data for decision making

**Christianne Lynnette Cabanban-Casem**

Commission on Higher Education, Philippines

*Abstract*—Key reforms in education increased access and improved the quality of basic education, improved the competencies of the workforce, and produced high-quality graduates. As the mandate of Commission on Higher Education (CHED), given the national government's commitment to transformational leadership that puts education as the central strategy for investing in the Filipino people, reducing poverty, and building national competitiveness and pursuant to Republic Act 7722, CHED aims to achieve the following objectives, "efficiently and effectively manage the higher education system ensuring transparency and integrity in its programs and activities as its commitment to moral ascendancy and strengthen the Commission on Higher Education and other major stakeholders. With the tremendous growth in the amount of data generated in CHED, arising problems in volume, velocity, variety and veracity of data, it has become almost impossible to process these data with the existing storage techniques and plain queries because of underlying problems in huge data size, slow processing of data, various data sources and reliability of data.

This research proposal outlines opportunities and challenges associated with the implementation and governance of Big Data in higher education through the development and implementation of a data analytics tool.

## Session 1

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 13:00-15:30**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. Yong Jin Park**

**AP0044-A** Presentation 4 (13:45~14:00)

Anime Colorization with End2End pixel-wise color palette based classification from line sketch

**Dong Heon Cho** and Byung Do Chung

Yonsei University, South Korea

*Abstract*—Colorizing anime sketch is laborious work for the artist especially drawing similar objects like serializing webtoons. Colorization algorithm requires a user guide to choosing the proper color which designer commonly using. In this research, we focus on to end-to-end colorizing with the color palette which is highly used by an artist to represent a similar style for the outcome. The colorization model has two processes for producing the result: the color template extractor calculates high-frequency color set from previous anime series and the coloring model choose the proper value from color palette which is calculated from the extractor. For the coloring model, we adopt the neural network and generative adversarial structure for achieving solid result and training efficiency to our result. With this approach, our proposed model can choose similar concept of colors which are compared with the previous set of anime and more consistent coloring than RGB channel generation without a human guide.



## Session 1

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 13:00-15:30**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. Yong Jin Park**

**AP0047** Presentation 5 (14:00~14:15)

Mobile Medical Question and Answer System with Improved Charlevel based Convolution Neural Network and Sparse Auto Encoder

**Guokai Yan** and Jianqiang Li,

College of Computer Science and Software Engineering, Shenzhen University, China

*Abstract*—Last few years, China has entered into an open and comprehensive two-child era which cause the demand for medical resources of elderly pregnant women more scarce. And the accuracy will be effected by the accuracy of Chinese word segmentation during the classification of questions. To solve those problem above, we are presenting a Chinese Mother-to-Child Domain Question Answering System . We propose a improved end-to-end convolutional neural networks with Sparse Auto Encoder(SAE) layer to extract information at Char-level. It has achieved a significant effect both in accuracy and avoiding over-fitting.

## Session 1

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 13:00-15:30**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. Yong Jin Park**

**AP0012** Presentation 6 (14:15~14:30)

Illumination Classification based on No-Reference Image Quality Assessment (NR-IQA)

**Syed Mohd Zahid Syed Zainal Ariffin<sup>1</sup>** and Nursuriati Jamil<sup>2</sup>

1.Asia Pacific University of Technology and Innovation, Malaysia, 2.Universiti Teknologi MARA, Malaysia

*Abstract*—In this paper, we propose an approach to classify image illumination using no-reference image quality assessment metric (NR-IQA). Two NR-IQA metric (image entropy (IE) and standard deviation (SD)) and mean of the pixel value (Mean) were used to classify the illumination. The proposed technique is tested using DIAST Variability Illuminated Thermal and Visible Ear Images Datasets. Images in the dataset are categorized into three illumination categories namely dark, average and bright. Based on quantitative analysis of the database images, the metric value of IE, SD and Mean are always highest for bright illumination compared to average illumination (intermediate) and dark (lowest). Further experiment was done to automatically categorize the image using commonly used classifiers, k-Nearest Neighbour (k-NN), Multinomial Regression (MR), Support Vector Machine (SVM), Naïve Bayes (NB) and Random Forest (RF). Classification based on combination of IE+SD+Mean achieve the highest accuracy of 83.92%. This is a promising result for further study on illumination classification.

## Session 1

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 13:00-15:30**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. Yong Jin Park**

**AP0017** Presentation 7 (14:30~14:45)

Prediction Framework for Potential Tuna Fish Zone in Indonesia

**Devi Fitrianah**<sup>1</sup>, Remmy A.M Zen<sup>2</sup> and Nursidik Heru Praptono<sup>3</sup>,

1. Universitas Mercu Buana, Indonesia, 2.National University of Singapore, Singapore, 3.Universitas Indonesia, Indonesia

*Abstract*—As the promising and futuristic commodity, tuna fish catching becomes one of the most important activities that holds significant impacts for the people life. One of the problem to maximize the efficiency of fishing is to predict appropriately, which area belongs to potential or non-potential. This paper proposes a framework utilizing regression process and classification method to predict potential tuna fishing zones. We would like to predict the potential area  $A$  given time  $t$ , or  $A(t)$ . On the other words, by using only the time as the input, we can predict whether the area is potential or non-potential. The regression process, in this case, is to predict the feature value at the given time. We try several regression functions and find that the logarithmic function achieves the best result. In addition, the classification method is performed to decide whether an area belongs to potential or non-potential zone. The result of the experiment shows that for some cases prediction gives the high accuracy, while there are some low accuracy values. The highest accuracy reaches 92.75% by using SVM classifier. Several experiments achieve low or even zero results, because of data limitations causing an under-fitting regression. However, our proposed framework can be utilized to predict the potential tuna fishing zones.

## Session 1

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 13:00-15:30**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. Yong Jin Park**

**AP0032** Presentation 8 (14:45~15:00)

Visual Perception Games for Autistic Learners: Findings

**Faaizah Shahbodin**, Che Ku Nuraini Che Ku Mohd and Azni Haslizan Ab Halim

Universiti Teknikal Malaysia Melaka, Malaysia

*Abstract*—Early identification and diagnosis of autism is the key to minimizing its negative effects and to getting the child on the right road. Furthermore, early diagnosis of autism in children is an important key to reducing adult autism. Autism detection games are important because millions of children with autism go through the school system undetected. The paper report the findings of autism diagnostic tool using serious games technique. The game is namely as Vi-Per Games. It is a tool for special education teachers to diagnose visual perception problems among autistic students. The development of the game is based on ADDIE model. The results show that the use of Vi-Per Games successfully assist and facilitate teachers when making a diagnosis of visual perception problems in autistic students, compared with conventional methods of diagnosis. Diagnosing visual perception problems using serious games gives teachers and students enjoyable experiences in a way that no other medium can offer.



## Session 1

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**Afternoon, January 26, 2019 (Saturday)**

**Time: 13:00-15:30**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. Yong Jin Park**

**AP0046** Presentation 9 (15:00~15:15)

User Perception Towards Cultural-Based E-Government Portal Design

**Farez Mahmood**, Wan Adilah Wan Adnan, Nor Laila Md Noor and Fauzi Mohd Saman Universiti Teknologi MARA (UiTM) Shah Alam, Malaysia

*Abstract*—The purpose of this paper is to analyze user perception towards cultural-based e-government portal design. User perception is measured based on feedback on emotional state received from participants towards an e-government portal that has been developed based on cultural and emotional through look and feel. Cultural studies in the context of e-government development and implementation is still lacking. User testing was conducted with 33 participants. The data obtained have been analyzed. User testing specifically focus on the High and Low Power Distance Dimension. The participants gave their perceptions based on the prototype of e-government portal representing High and Low PD design. The results are based on the mean analysis. The PD design with a higher mean score indicates that it poses a stronger feeling on a particular emotion state. It can be conclude that the emotion states are perceived differently between High and Low PD design.

## Session 1

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**Afternoon, January 26, 2019 (Saturday)**

**Time: 13:00-15:30**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. Yong Jin Park**

**AP0049** Presentation 10 (15:15~15:30)

Evaluation of Capability Level and Improvements Prioritization on Device Accreditation Services Based On CMMI-SVC Framework Continuous Representation

**Eko K. Budiardjo**, Nanda N. Hadyan, Alex Ferdinansyahand Yuki Alqadri

Faculty of Computer Science - Universitas Indonesia, Indonesia

*Abstract*—The need for an information technology system that is adaptive to business change, encouraging many companies to provide the optimal quality of information technology systems. XYZ CORP. is a managed service provider company, currently has problems in providing device accreditation services. Device accreditation service is a testing service of information technology devices. The purpose of this study is to establish the priority of process improvement in the presentation of device accreditation services. To overcome this problem, this research uses CMMI-SVC framework with continuous representation. There are 4 stages: rating of company needs, process area ranking in line with company requirement, capability evaluation in selected area process and priority of recommendation of improvement. The company needs assessment and process area ranking is determined using correlation matrix QFD. Then evaluated the process area with SCAMPI-C tools. It was found that the five selected process areas have not run all specific practice so that it only has level 0 capability level. Recommendation determination using pareto analysis to get recommendations that solve problems in process of service accreditation service significantly. The recommendations resulted in the design of procedures for device accreditation services.



**Coffee Break**

**15:30~16:00**

## Session 2- Computer and information security

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 16:00-18:00**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. YAMAZAKI Tatsuya**

**AP0007** Presentation 11 (16:00~16:15)

ESL Live broadcast teaching service in a university library

**Lih-Juan Chanlin**

Fu Jen Catholic University, Taiwan

*Abstract*—We proposed a novel method that selects an optimal classifier model's parameter status through the uncertainty measure evaluation of the estimated class boundaries instead of an estimation of the classification error probability. A key feature of our method is its potential to perform a classifier parameter status selection without a separate validation sample set that can be easily applied to any reasonable type of classifier model, unlike traditional approaches that often need a validation sample set or are sometimes less practical. In this paper, we first summarize our method and its experimental evaluation results and introduce the mathematical formalization for the posterior probability estimation procedure adopted in it. Then we show the convergence property of the estimation procedure and finally demonstrate our method's optimality in a practical situation where only a finite number of training samples are available.



## Session 2

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 16:00-18:00**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. YAMAZAKI Tatsuya**

**AP0027-A** Presentation 12 (16:15~16:30)

Codegum Inc. A Web Based Accounts Management System

**Eugene Marlou Aquilino**

UST IICS, Philippines

*Abstract*—The application of live broadcasting has caught attention in a wide variety of learning contexts in recent years. In higher education, university plays a very important role in teaching enhancement. Live broadcast media provide a platform for the library to establish an English self-learning social community and to encourage communication among the group members. Through the live video and instant messages delivered by the network, the library can adapt various strategies for presenting the content in different forms (live videos, graphics, texts, video, and links). In this study, the integration of live broadcasting in English as a second language (ESL) learning is implemented in a library. Together with the implementation, reactions from the librarian, the teacher, the students, and library support staff were gathered. From their reactions, the participants were positive about the broadcast approach to learning ESL. However, challenges exist for keeping all students committed to attending the class. More interesting topics and the use of interactive activities in the class are suggested in future implementations.

## Session 2

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 16:00-18:00**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. YAMAZAKI Tatsuya**

**AP0033** Presentation 13 (16:30~16:45)

An Eclipse Plug-in Tool for Generating Test Cases from Source Codes

**Rosziati Ibrahim**<sup>1</sup> and Sapiee Jamel<sup>2</sup>

1. Universiti Tun Hussein Onn Malaysia (UTHM), Malaysia, 2. Maryam Ahmed, Imam Abdulrahman Bin Faisal University (IAU), Saudi Arabia

*Abstract*—Most software development will use a standard software development life cycle (SDLC). In SDLC, four phases are involved during development of any system. They are analysis, design, implement and testing. During testing phase, test cases are used in order to test the functionalities of the system developed. Test cases are generally extracted from the source codes manually. This paper presents an alternative solution to automate the process of generating the test cases by developing an eclipse plug-in tool. The plug-in tool is able to generate the test cases automatically from the source codes by examined its line of code (LOC). The plug-in tool is an open source software to help the software developers generate the test cases for their system that they developed. It will help to ease the problems for software developers to come up with test cases manually as well as to check the system functionalities whether it meets the users' requirements or not.

## Session 2

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 16:00-18:00**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. YAMAZAKI Tatsuya**

**AP0045** Presentation 14 (16:45~17:00)

Interactive Multi-Objective Optimization Using Mobile Application; Application to Multi-Objective Linear Assignment Problem

**Shinmyeong Kim** and In-Jae Jeong

Hanyang university, South Korea

*Abstract*—In the past decades, there has been a plenty of researches on multi-objective programming (MOP) problems due to the unreality of single-objective programming problems. However, multi-objective programming problems have also been discussed in terms of information security issues, the preference of people involved in decision-making and so on. A recently developed a decentralized coordination algorithm has the advantage of generating a Pareto optimal solution under the condition that information of each agent involved in decision making is not shared. Nevertheless, this algorithm does not reflect the preference of each decision maker, and thus can generate a biased Pareto optimal solution.

Therefore, in this study, we developed a mobile application that iteratively searches the Pareto optimal solution through the decentralized coordination algorithm by inputting the parameter value reflecting the preference of each human decision maker in the multipurpose linear assignment problem. A statistical analysis was performed to identify factors affecting to the generation of unbiased pareto solutions.

## Session 2

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 16:00-18:00**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. YAMAZAKI Tatsuya**

**AP0020** Presentation 15 (17:00~17:15)

Capacity Investigation of Markov Chain Based Statistical Text Steganography: Arabic Language Case

**Nujud Alghamdi** and Lamia Berriche

Al-Imam Mohammad Ibn Saud Islamic University, Saudi Arabia

*Abstract*—Nowadays, there is a high motivation to develop techniques of sending secret information as a result of the need to transfer some data in a secret way. Steganography is one of the important techniques in this field. In particular, statistical text steganography is classified as an immune technique against the majority of steganalysis techniques compared to other steganography techniques. On the other hand, although Arabic is the official language for many countries, many steganography techniques remain unexplored for it. In this work, we implemented a Markov Chain (MC) encoder/decoder combined with Huffman Coding (HC) for Arabic text steganography. We also computed an upper bound and a lower bound for the stego-text length which depend on the designed encoder/decoder parameters. The proposed Arabic steganography technique capacity performance was investigated for different encoder parameters and secret message length. We found that applying some constraints on the MC increases the embedding capacity till reaching an upper limit floor.

## Session 2

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 16:00-18:00**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. YAMAZAKI Tatsuya**

**AP0035** Presentation 16 (17:15~17:30)

Lightweight Cryptography Techniques for MHealth Cybersecurity

**Azni Haslizan Abhali**<sup>1</sup>, Tasnuva Ali<sup>1</sup>, Faaizah Shahbodin<sup>2</sup>, Che Ku Nuraini Che Ku Mohd<sup>2</sup>

1. Universiti Sains Islam Malaysia, Malaysia 2. Universiti teknikal malaysia melaka, Malaysia

*Abstract*—A new integration of wireless communication technologies into the mobile health system also known as mHealth has instigated a momentous research interest in the field of mobile security. mHealth systems are unique in terms of characteristics, challenges, architecture, and applications. Consequently, security requirements related to mHealth system are more complex as compared to mobile networks and conventional wireless networks. This article presents a survey about developments in mHealth system from the perspective of lightweight cryptographic protocols and privacy preserving algorithms. Unique characteristics of mHealth systems are presented which make the embedded security applications computationally hard as well as memory constrained. The current study also deals with the fundamental security requirements, essential for mHealth communication. Furthermore, awareness of security threats and their cryptographic solutions in terms of future health industry are discussed. In addition, lightweight cryptographic solutions are summarized. These strategies can be enhanced or incorporated all in all to meet the security prerequisites of future patients' data security.



## Session 2

**Tips:** The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

**Afternoon, January 26, 2019 (Saturday)**

**Time: 16:00-18:00**

**Venue: Regent Room, Hotel Regent Marine The Blue**

**Session Chair: Prof. YAMAZAKI Tatsuya**

**AP3002** Presentation 17 (17:30~17:45)

Quality of Service for Traffic Monitoring System based on Static Routing using EoIP Tunnel over IPSec

**Ida Nurhaida** and Ngadiyono

Universitas Mercu Buana, Indonesia

*Abstract*—The development of internet networks requires a network administrator to implement various topology schemes on the location of the different network. It is intended to make each other enables to communicate in one area and monitor the use of traffic. This research aims at creating private network connection by ensuring its security and distributing public address through algorithm routing static. Network Development Life Cycle (NDLC) is utilized as the research method. Based on the implementation of EoIP tunnel network over IPSec, the researcher analysed the Quality of Service (QoS) for EoIP tunnel non-IPsec with EoIP tunnel over IPSec to find out the comparison. The Result revealed that EoIP tunnel over IPsec has throughput 93.04%, delay 1.43 ms, jitter 1.41 ms, and packet loss 0.43%. The data is fewer than the data of EoIP non-IPsec with throughput 94.85%, delay 1.39 ms, jitter 1.37 ms, and packet loss 0.52%. The differentiation caused by the encryption negotiation process during the network connected. Hopefully, this research has a contribution to make user is more accessible to communicate in the local area and monitor the traffic use centrally.



# Poster Presentation Abstracts

## Poster session

January 26, 2019 (Saturday)

Time: 10:50~16:00

Venue: Regent Room, Hotel Regent Marine The Blue

Session Chair: Prof. Chin-Chen Chang

### **AP0019** Poster 1

Development of a HTML5 game with Construct2 for learning applications

**Yi Hsuan Wang**

Tamkang university, Taiwan

*Abstract*—In this study, the researcher adopted a HTML5 game engine to develop a cross-platform educational game for learning applications. The developed game could be run on various platforms and several game elements and principles were considered during the design stage. The purpose of the educational game was to help new students to get familiar with the new school, and the learning missions were embedded into a macro-context to simulate a virtual campus for helping students learn and explore the environment, policies, and routines of the school. After the complete development of the game, a group of students were invited to use and test the game, and their feedback were collected through questionnaires. The structure and learning missions of the developed educational game, and the pilot evaluation resulted were reported in the paper.

## Poster session

January 26, 2019 (Saturday)

Time: 10:50~16:00

Venue: Regent Room, Hotel Regent Marine The Blue

Session Chair: Prof. Chin-Chen Chang

### AP3001 Poster 2

Development of Traffic Flow Measurement System Using Fixed Point Cameras

**Masaya KIKUZAWA** and ManYong JEONG

Numazu College, Japan

*Abstract*—Recently, traffic congestions caused by increase of vehicle possession and complicatedness of traffic system have induced several serious social problems. In order to solve these problems, a lot of attempts have been carried out in many areas including new type of traffic signal system employing fuzzy control or neural network system. In addition to that system, a visualized miniature traffic simulation system based on real road system has been developed to examine the performance of the new traffic signal system. However, they were not sufficiently model that was able to reproduce the real traffic behaviors. In this study, a traffic flow measurement system has been developed to extract traffic flow data by analyzing images from the fixed point cameras set up near intersections. The traffic measurement system has been developed by optical flow and R-CNN, and its performance was evaluated based on the recognition rate of the number of cars passing the intersection and the recognition rate of matching for the same vehicle and the accuracy of the means speed estimated by the difference of passing time at two intersections. The result showed that the new system has higher rate of matching for same vehicle than previous study.



Dinner

18:00~19:00

Venue: Restaurant Latif, 1st Floor, Hotel Regent Marine The Blue

# One Day Visit

**January 27, 2019 (Sunday) 9:00~17:00**

(Tip: The following places are for references, and the final schedule should be adjusted to the actual notice.)

Jeju island is a very charming scenery of island. With its swaying palm trees, beaches and towering volcanic landscapes, jeju has become South Korea's biggest resort and honeymoon destination. The alleys of the east are dominated by volcanic stone fences and lush wooded hills, and you will enjoy the sunshine and the baptism of the mountains. In the south, the alleyways guide you through the strange river and sea of jeju, with zero distance to explore the natural nature of the coast, the countryside, and the mountains.

**(9:00) Assemble**

**(9:00-12:00) Morning Visit**

**Sopjikoji (섭지코지)**

Seopjikoji is located at the end of the eastern shore of Jeju Island and boasts a fantastic scenery especially in April when yellow canola flowers are in full bloom. "Seopji" is the old name for the area, and "Koji" is Jeju dialect meaning a sudden bump on land. On top of the hill stands Hyeopja Beacon Fire Station, reaching 4 meters in height with a width and length of 9 meters.



**Seongsan Ilchulbong Peak [UNESCO World Heritage]**

**(성산일출봉 [유네스코 세계문화유산])**

Seongsan Ilchulbong Peak rose from under the sea in a volcanic eruption over 100,000 years ago. Located on the eastern end of Jeju Island, there is a huge crater at the top of Seongsan Ilchulbong Peak. The crater is about 600m in diameter and 90m high. With the 99 sharp rocks surrounding the crater, it looks like a gigantic crown. While the southeast and north sides

are cliffs, the northwest side is a verdant grassy hill that is connected to the Seongsan Village. The ridge provides an ideal spot for walks and for horse riding as well.

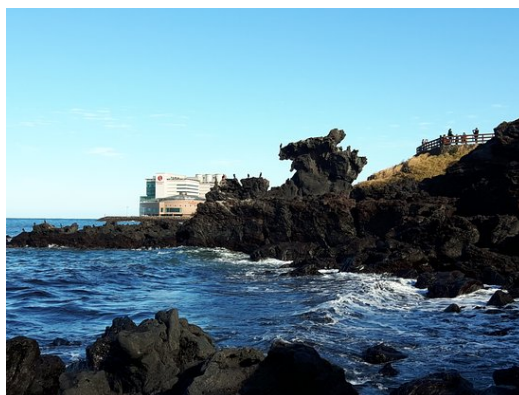
The sunrise from the crater is magnificent. Also the Seongsan Ilchulbong Peak surrounded by bright yellow colored rapeseed flowers in the spring is truly a sight to behold

**(12:00-14:00) Lunch time**

## (14:00-17:00) Afternoon visit

### Yongduam (용두암)

Situated to the north of Jeju City, Yongduam was created by strong winds and waves over thousands of years. However, there are plenty of other stories of how it came to be. One legend has it that a dragon stealing precious jade from Mt. Halla was shot down by an arrow from the mountain deity. When he fell down on Yongduam, his body immediately sank into the ocean and his head rapidly froze looking at the sky. Another legend has it that a white horse, who dreamed of being a dragon and ascending to the sky, came to be caught by a soldier and froze into the rock.



### Jeju Folklore & Natural History Museum

#### (제주특별자치도민속자연사박물관)

Jeju Folklore & Natural History Museum currently has on exhibition folklore remains and natural historical materials of Jeju-do that were excavated in Jeju-do and displayed in 1984.

The museum is divided into four exhibition halls: the Natural History Hall, the Folklore Exhibition Hall

I , the Folklore Exhibition Hall II , and the Outdoor Exhibition.

### Jeju Central Underground Shopping Center

#### (제주중앙지하상가)

Located in Jungangro of downtown Jeju, Jungang Underground Shopping Center is a modern underground shopping arcade that recently re-opened after a major renovation. Stretching over Jungangro, Seomunro and Dongmunro, the center has over 280 stores. It is the only underground shopping arcade in Jeju Island, and offers a pleasant shopping experience.



## (17:00) Back to Hotel



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**Note**