The 9th International Conference on Computer Science and its Applications (CSA 2017) & The 12th KIPS International Conference on Ubiquitous Information Technologies and Applications (CUTE 2017)

December 18-20, 2017
Taichung, Taiwan

Organized by
KIPS CSWRG
Conferences

The 2018 Global Conference on Information Technology, Computing, and Applications (GlobalIT 2018)
  - http://www.globalitconf.org/

The 2018 World Congress on Information Technology Applications and Services "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing" (WorldIT Congress 2018 Jeju)
- February 20-22 2018, Jeju, Korea.
  - http://www.worlditcongress.org/

The 12th International Conference on Multimedia and Ubiquitous Engineering (MUE2018)
- April 23-25 2018, Salerno, Italy
  - http://www.mue-conference.org/2018

The 13th International Conference on Future Information Technology (FutureTech2018)
- April 23-25 2018, Salerno, Italy
  - http://www.futuretech-conference.org/2018
International Conference on Computer Science and its Applications (CSA 2017) is the 9th event of the series of international scientific conference. This conference takes place Taichung, Taiwan, Dec. 18 - 20, 2017. CSA 2017 will be the most comprehensive conference focused on the various aspects of advances in computer science and its applications. CSA 2017 will provide an opportunity for academic and industry professionals to discuss the latest issues and progress in the area of CSA. In addition, the conference will publish high quality papers which are closely related to the various theories and practical applications in CSA. Furthermore, we expect that the conference and its publications will be a trigger for further related research and technology improvements in this important subject. CSA 2017 is the next event in a series of highly successful International Conference on Computer Science and its Applications, previously held as CSA 2016 (7th Edition: Bangkok, Thailand, 2016), CSA 2015 (7th Edition: Cebu, December, 2015), CSA 2014 (6th Edition: Guam, December, 2014), CSA 2013 (5th Edition: Danang, December, 2013), CSA 2012 (4th Edition: Jeju, November, 2012), CSA 2011 (3rd Edition: Jeju, December, 2011), CSA 2009 (2nd Edition: Jeju, December, 2009), and CSA 2008 (1st Edition: Australia, October, 2008).

The papers included in the proceedings cover the following topics: Mobile and ubiquitous computing, Dependable, reliable and autonomic computing, Security and trust management, Multimedia systems and services, Networking and communications, Database and data mining, Game and software engineering, Grid and scalable computing, Embedded system and software, Artificial intelligence, Distributed and parallel algorithms, Web and internet computing and IT policy and business management.

Accepted and presented papers highlight new trends and challenges of Computer Science and its Applications. The presenters showed how new research could lead to novel and innovative applications. We hope you will find these results useful and inspiring for your future research. We would like to express our sincere thanks to Steering Chairs: James J. (Jong Hyuk) Park (SeoulTech, Korea), Han-Chieh Chao(National Ilan University, Taiwan) and Mohammad S. Obaidat(Monmouth University, USA). Our special thanks go to the Program Chairs: Gangman Yi (Dongguk University, Korea), Houcine Hassan (Universitat Politècnica de València, Spain), Yu Chen (State University of New York, Korea), Hwamin Lee (Soochunhyang University, Korea), Jin Wang (Yangzhou University, China), Jaeho Lee (Seowon University, Korea), all Program Committee members and all the additional reviewers for their valuable efforts in the review process, which helped us to guarantee the highest quality of the selected papers for the conference.

We cordially thank all the authors for their valuable contributions and the other participants of this conference. The conference would not have been possible without their support. Thanks are also due to the many experts who contributed to making the event a success.

CSA 2017 General Chair

Young-Sik Jeong, Dongguk University, Korea
Yang Xiao, University of Alabama, USA
Vincenzo Loia, University of Salerno, Italy
Rung-Shiang Cheng, Kunshan University, Taiwan
Victor Leung, University of British Columbia, Canada
Ka Lok Man, Xi'an Jiaotong-Liverpool University, China
Message from the CSA 2017 Program Chairs

Welcome to the 8th International Conference on Computer Science and its Applications (CSA 2017) which will be held in Bangkok, Thailand, Dec. 18 - 20, 2017. CSA 2017 will be the most comprehensive conference focused on the various aspects of advances in computer science and its applications.


CSA 2017 contains high quality research papers submitted by researchers from all over the world. Each submitted paper was peer-reviewed by reviewers who are experts in the subject area of the paper. Based on the review results, the Program Committee accepted papers.

For organizing an International Conference, the support and help of many people is needed. First, we would like to thank all authors for submitting their papers. We also appreciate the support from program committee members and reviewers who carried out the most difficult work of carefully evaluating the submitted papers.

We would like to give my special thanks to Prof. James J. (Jong Hyuk) Park, Prof. Han-Chieh Chao, and Prof. Mohammad S. Obaidat, the Steering Committee Chairs of CSA for their strong encouragement and guidance to organize the symposium. We would like to thank CSA 2017 General Chair, Prof. Young-Sik Jeong, Prof. Yang Xiao, Prof. Vincenzo Loia, Prof. Rung-Shiang Cheng, Prof. Victor Leung, and Prof. Ka Lok Man. We would like to express special thanks to committee members for their timely unlimited support.

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Choong Ki Ahn, School of Electrical Engineering Korea University, Seoul, Korea.
Hamid Reza Karimi, Department of Mechanical Engineering via La Masa 1, 20156 Milan, Italy
Ardagna Claudio, University of Milan, Italy
Message from the CUTE 2017 General Chairs

On behalf of the organizing committees, it is our pleasure to welcome you to the 12th International Conference on Ubiquitous Information Technologies and Applications (CUTE 2017), will be held in Taichung, Taiwan on December 18-20, 2017.

This conference provides an international forum for the presentation and showcase of recent advances on various aspects of ubiquitous computing. It will reflect the state-of-the-art of the computational methods, involving theory, algorithm, numerical simulation, error and uncertainty analysis and/or novel application of new processing techniques in engineering, science, and other disciplines related to ubiquitous computing.

The papers included in the proceedings cover the following topics: Ubiquitous Communication and Networking, Ubiquitous Software Technology, Ubiquitous Systems and Applications, Ubiquitous Security, Privacy and Trust. Accepted papers highlight new trends and challenges in the field of ubiquitous computing technologies. We hope you will find these results useful and inspiring for your future research.

We would like to express our sincere thanks to Steering Committees: James J. Park (SeoulTech, Korea), Young-Sik Jeong (Dongguk University, Korea), Doo-Soon Park (SoonChunHyang University, Korea), Laurence T. Yang (St.Francis Xavier University, Canada), Hai Jin (Huangzhong University of Science and Technology, China), Chan-Hyun Youn (KAIST, Korea), Jianhua Ma (Hosei University, Japan), Minyi Guo (Shanghai Jiao Tong University, Japan), and Weijia Jia (City University of Hong Kong, Hong Kong). We would also like to express our cordial thanks to the Program Chairs & Program Committee members for their valuable efforts in the review process, which helped us to guarantee the highest quality of the selected papers for the conference.

Finally, we would thank all the authors for their valuable contributions and the other participants of this conference. The conference would not have been possible without their support. Thanks are also due to the many experts who contributed to making the event a success.

CUTE 2017 General Chairs

Yi Pan, Georgia State University, USA
Weimin Zheng, Tsinghua University, China
Gangman Yi, Dongguk University, Korea
Myung-Hyun Yoon, KETI, Korea
No Byung-Gyu, KISA, Korea
Hyoung Woo Park, KISTI, Korea
Message from the CUTE 2017 Program Chairs

Welcome to the 12th International Conference on Ubiquitous Information Technologies and Applications (CUTE 2017), will be held in Taichung, Taiwan on December 18-20, 2017.

The purpose of the CUTE 2017 conference is to promote discussion and interaction among academics, researchers and professionals in the field of ubiquitous computing technologies. This year the value, breadth, and depth of the CUTE 2017 conference continues to strengthen and grow in importance for both the academic and industrial communities. This strength is evidenced this year by having the highest number of submissions made to the conference.

For CUTE 2017, we received a lot of paper submissions from various countries. Out of these, after a rigorous peer review process, we accepted only high-quality papers for CUTE 2017 proceeding, published by the Springer. All submitted papers have undergone blind reviews by at least two reviewers from the technical program committee, which consists of leading researchers around the globe. Without their hard work, achieving such a high-quality proceeding would not have been possible. We take this opportunity to thank them for their great support and cooperation.

We would also like to sincerely thank the following invited speakers who kindly accepted our invitations, and, in this way, helped to meet the objectives of the conference:

- John Choi, Ph.D., Sangmyung University, Korea
- Yi Pan, Ph.D., Georgia State University, USA

Finally, we would like to thank all of you for your participation in our conference, and also thank all the authors, reviewers, and organizing committee members. Thank you and enjoy the conference!

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Hwamin Lee, Soonchunhyang University, Korea
The 9th International Conference on Computer Science and its Applications (CSA 2017)
The 12th KIPS International Conference on Ubiquitous Information Technologies and Applications (CUTE 2017)

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Min Choi, Chungbuk National University, Korea
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KwangMan Ko, Sangji University, Korea
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Okyoen Yi, Kookmin University, Korea
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Imad Saleh, University of Paris 8, France
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Jong-Myon, Kim University of Ulsan, Korea
Kwang Sik, Chung Korea National Open University, Korea
Chen Uei-Ren, Hsiuping University of Science and Technology
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Keun Ho Ryu, Chungbuk National University, Korea
Ki Yong Lee, Sookmyung Women's University, Korea
Lai Kuan-Chu, National Taichung University, Taiwan
Lam-for Kwok, City University of Hong Kong, Hong Kong
Loh Woong-Kee, Sungkyul University, Korea
Milan Markovic, Banca Intesa ad Beograd, Serbia
Pinaki A Ghosh, Atmiya Institute of Technology & Science, India
Pyung-Soo Kim, Korea Polytechnic University, Korea
Soo-Hyun Park, Kookmin University, Korea
Toshiyuki Kamada, Aichi University of Education, Japan
Wookey Lee, Inha University, Korea
Yong Ik Yoon, Sookmyung Women's University, Korea
Hong-Wook Huh, Pusan National University, Republic of Korea
Won-Jong Kim, Texas A&M University, USA

Local Arrangement Chairs
Chih-Hung Chang, Providence University, Taiwan
Tsan-Ching Kang, Providence University, Taiwan
Invited Speaker

Turtle Shell Based Information Hiding Mechanism

Chin-Chen Chang, Ph.D.
Professor of Feng Chia University Taichung, Taiwan

Abstract:
Steganography is the science of secret message delivery using cover media. A digital image is a flexible medium used to carry a secret message because the slight modification of a cover image is hard to distinguish by human eyes. In this talk, I will introduce some novel steganographic methods based on different magic matrices. Among them, one method that uses a turtle shells magic matrix to guide cover pixels modification in order to imply secret data is the newest and the most interesting one. Experimental results demonstrated that this method, in comparison with previous related works, outperforms in both visual quality of the stego image and embedding capacity. In addition, I will introduce some future research issues that derived from the steganographic method based on the magic matrix.

Biography:
Professor C.C. Chang was born in Taichung, Taiwan on Nov. 12th, 1954. He 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 Chiao Hung 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.
### PROGRAM SCHEDULE FOR CSA & CUTE 2017

#### Day 1, December 18, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Min</th>
<th>HALL A</th>
<th>HALL B</th>
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<tr>
<td>08:40-09:00</td>
<td>20</td>
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<tr>
<td>09:00-10:30</td>
<td>90</td>
<td>Session A-1 CUTE</td>
<td>Session B-1 SDNMC</td>
<td>Session C-1 CSA</td>
<td>Session D-1 SLLS</td>
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<tr>
<td>10:30-10:40</td>
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<td>Coffee Break</td>
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<tr>
<td>10:40-12:10</td>
<td>90</td>
<td>Session A-2 CUTE</td>
<td>Session B-2 HRH</td>
<td>Session C-2 CSA</td>
<td>Session D-2 SLLS</td>
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<td>12:10-13:30</td>
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<td>Lunch</td>
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<tr>
<td>13:30-14:30</td>
<td>60</td>
<td>Keynote: Chin-Chen Chang, Ph.D. Professor of Feng Chia University Taichung, Taiwan</td>
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<tr>
<td>14:30-14:40</td>
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<td>Coffee Break</td>
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<tr>
<td>14:40-16:10</td>
<td>90</td>
<td>Session A-3 CUTE</td>
<td>Session B-3 ATFC</td>
<td>Session C-3 CSA</td>
<td>Session D-3 ISWP</td>
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<tr>
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<td>Coffee Break</td>
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<tr>
<td>16:20-17:50</td>
<td>90</td>
<td>Session A-4 CUTE</td>
<td>Session B-4 SoReMo</td>
<td>Session C-4 CSA</td>
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<tr>
<td>18:00-20:00</td>
<td>120</td>
<td>Reception</td>
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## Day 2, December 19, 2017

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<td>09:00-10:30</td>
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<td>Session A-5 CUTE</td>
<td>Session B-5 IRuH</td>
<td>Session C-5 CSA</td>
<td>Session D-5 CUTE</td>
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<td>Coffee Break</td>
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<td>10:40-12:10</td>
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<td>Session A-6 CUTE</td>
<td>Session B-6 IRuH</td>
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<td>13:30-15:00</td>
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<td>Session A-7 CUTE</td>
<td>Session B-7 IRuH</td>
<td>Session C-7 CSA</td>
<td>Session D-7 HRH</td>
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<tr>
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<td>Break</td>
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<tr>
<td>18:00-20:00</td>
<td>120</td>
<td>Banquet</td>
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## Day 3, December 20, 2017

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<tr>
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<td>120</td>
<td>CSA - Organizing Committee Meeting</td>
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<td>13:00-15:00</td>
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<td>CUTE - Organizing Committee Meeting</td>
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<tr>
<td>15:00-17:00</td>
<td>60</td>
<td>Local Arrangement Committee Meeting</td>
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</table>

1. A paper presentation should be made by one of authors of the paper for 20 minute (15 minutes for the presentation itself and 5 minutes for Q/A).
2. All speakers of each session should meet the session chair at their room 10 minutes before the session begins.
3. Windows 7 laptops running the Adobe Reader and Microsoft Office for paper presentations will be prepared. Please prepare for your presentation.
DETAILED SCHEDULE FOR
THE 9TH INTERNATIONAL CONFERENCE ON
COMPUTER SCIENCE AND ITS APPLICATIONS (CSA 2017)
&
THE 12TH KIPS INTERNATIONAL CONFERENCE
ON UBIQUITOUS INFORMATION TECHNOLOGIES AND
APPLICATIONS (CUTE 2017)

Day 1, December 18, 2017 (Monday)

08: 30-09: 00 Registration

09: 00-10: 30 Session A-1 : CUTE
(HALL A)
(Chair:N/A)

1. Continuous-Time Estimation Filtering with Incorporation of Temporary Model Uncertainty
   Pyung Soo Kim
2. Design and Implementation of a Wearable Device for the Blind by using Deep Learning based Object Recognition
   Bongjae Kim, Hyuntae Seo, Jeong-Dong Kim
3. Glove type Air Mouse powered by Kalman Filtering and Complementary Filtering
   Jae Sung Choi, Won Jun Byoun, Ji Su Park, Min Hyung Lee, Ye Seul Kang, Hyun Lee
4. IoT-based VR Service Model to Improve Exercise Capacity
   Jeong-Dong Kim, Min-Gyu Park, Do-Yeon Ki, Bum-Hee Cho, Gil-Yong Lee, Bongjae Kim
5. study on multi-screen patterns and multi-device experiences in multi-screen ecosystem
   Geun-Hyung Kim
6. A Study on resource scaling scheme for energy efficiency in cloud datacenter
   A-Young Son, Eui-Nam Huh

09: 00-10: 30 Session B-1 : SDNMC
(HALL B)
(Chair:N/A)

1. Software Defined Personal Area Network for Secure and Efficient File Management
   Young-Hoon Park, Kwangman Ko
2. A QoE based Trustable SDN Framework for IoT Devices in Mobile Edge Computing
   Hamid Tahael, Nor Badrul Anuar, Rosdli Shalleh, Kwangman Ko, Suchong Joo

3. Adaptive Opportunistic Routing over DTMANETS: Proposals and Issues
   Javid Ali, Raja Wasim, Tahir Maqsood, Junaid Shuja, Soongohn Kim, Kwangman Ko

4. Advertise based Adaptive Model for IoT devices in Network Virtualization Environment
   Yunhee Kang, Younghoon Park, Kwangman Ko

5. Building the de-obfuscation platform based on LLVM
   Jijhun Kim, Kwangman Ko, Jonghee Youn

   Raja Wasim Ahmad, Soongohn Kim, KwangMan Ko, Young-Hoon Park

09:00-10:30 Session C-1: CSA
(HALL C) (Chair:N/A)

1. Cost Effective Online Traffic Engineering Algorithm on Inter-Datacenter
   Jun Zhao, Congxiaox Bao, Xing Li

2. ICN Based Disaster Area Network Platform
   Masashi Katsumata

3. Analysis of agenda prediction according to big data based creative education performance factors
   JiHoon Seo, Eunmi Cho, KilHong Joo

4. Image-Based Malware Classification using Convolutional Neural Network
   Kim Hae-Jung

   Woosung Choi, Jonghyeon Min, Taemin Lee, Kyeongseok Hyun, Taehyung Lim, Soonyoung Jung

6. A Study on Traffic Signal Waiting Model Using Queuing Theory
   JoongHoon Lee, HyuckJoong Yoon, Tae-Sun Chung

09:00-10:30 Session D-1: SLLS
(HALL D) (Chair:N/A)

1. Multimedia Design Approaches by Just noticeable difference(JND) of Audiovisual Modalities
   Suhhee Yoo, Mincheol Whang

2. Usability Improvement of Life-logging Content Based on Gamification Factor
   Sojung Kwak, Jieun Kwon

3. The Relationships between Behavioral Patterns and Emotions in Daily Life
   Hyunwoo Lee, Ayoung Cho, Youseop Jo, Mincheol Whang

4. Correlation Analysis between Environmental Sound and Human Emotion
   Min Woo Park, Hyeonsang Hwang, Eui Chul Lee

5. Classification of Web Content by Category Generation in Social Life Logging
6. **Embodied Emotion Recognition System**  
Ayoung Cho, Hyunwoo Lee, Hyeonsang Hwang, Youseop Jo, Mincheol Whang

7. **Patterns of Cardiovascular and Behavioral Movements in Life-Logging According to Social Emotions**  
Hana Lee, Youngho Jo, Heajin Kim, Mincheol Whang

10: 30-10: 40 Coffee break

10: 40-12: 10 Session A-2 : CUTE  
(HALL A)  
(Chair: N/A)

1. **Ubiquitous Authentication and Authorization Mechanism for Enterprise Resources Acquisition**  
Mei-Yu Wu, Chih-Kun Ke, Ming-Ru Lee

2. **Hybrid sensing and behavior-aware in pedestrian hazard detection**  
Svetlana Kim, Yong-Ik Yoon

3. **Cross-cultural Touch-based SNS Interface Design for Elderly**  
Fanny Febrianis Susilo, Jung-Ho Lee, Ji-Hyung Park, Jung-Min Park

4. **A Framework for Blockchain based Secure Smart Green House Farming**  
Akash Patil, Bayu Adhi, Yongho Park, Kyung-Hyune Rhee

5. **Multi-Level Key Establishment with Space-Time Graphs for Delay Tolerant Networks**  
Jinyeong Kang, Inwhee Joe

6. **Comparison and Analysis of Operating System Fingerprinting Tools**

7. **A Selective Data Protection Method using Encryption Folder in Public Cloud Environment**

10: 40-12: 10 Session B-2 : HRH  
(HALL B)  
(Chair: N/A)

1. **Study on the Screen Design Technique for Designing Applications**  
Taewoo Kim, Sunyi Park, Jeongmo Yeo

2. **Study on the Business Process Design Method for Designing Applications**  
JinSoo Sunyi Park, Taewoo Kim, Jeongmo Yeo

3. **A System Design for Application of Sound Color Conversion System on TV Music Programs**  
Jeongmin Lee

4. **Design of Mobile Atmospheric Pollution Monitoring System**  
Kyeongseok Park, Sungkak Kim, Sojeong Lee, Kyoung-Sook Kim, Soyoung Hwang

5. **Simulator Design of Remote Synchronization Method for Onboard Clock**  
Donghui Yu, Soyoung Hwang

6. **A Network Clock Model for the Internet of Things**  
Soyoun Hwang, Dong-Hui Yu
The 9th International Conference on Computer Science and its Applications (CSA 2017)
The 12th KIPS International Conference on Ubiquitous Information Technologies and Applications (CUTE 2017)

10: 40-12: 10 Session C-2 : CSA
(HALL C)
(Chair:N/A)

1. Service Aware Orchestration for Dynamic Network Slicing in 5G Networks
   Jeongyun Kim
2. Improved Schedulability Analysis of Fixed-Priority for Mixed-Criticality Real-Time Multiprocessor Systems
   Namyoung Jung, Jinkyu Lee
3. Analysis of the Elements of future development of Korean style Software Education through the Opinion Mining Technique
   JiHoon Seo, KilHong Joo
4. Design of Zigbee-BLE Gateway Direct Communication System for Smart Home Environment
   Jae-Sung Shim, Hyung-Joon Kim, Nam-Uk Lee, Seok-Cheon Park
5. Design of Automatic Source Code Generation based on User Pattern Definition
   Seung-Su Yang, Hyung-Joon Kim, Nam-Uk Lee, Seok-Cheon Park
6. Design of TDD-based Automation System for Android Application Test Automation
   Min-Hyung Park, Hyung-Joon Kim, Young-Hwan Jang, Seok-Cheon Park

10: 40-12: 10 Session D-2 : SLLS
(HALL D)
(Chair:N/A)

1. The Two Dimensional Model of Social Emotion based on Social Life Logging
   Heajin Kim, Youngho Jo, Hana Lee, Mincheol Whang
2. Emotion Recognition through Cardiovascular Response in Daily life using KNN Classifier
   Youseop Jo, Hyunwoo Lee, Ayoung Cho, Mincheol Whang
3. Heart rate measurement using thermal imaging camera
   Yosep Park, Yoonkyoung Kim, Jinman Kim, Eui Chul Lee
4. Single-Camera Vision-Based Vein Biometric Authentication and Heart Rate Monitoring via Infrared Imaging Analysis
   Hyun Han, Jinman Kim, Eui Chul Lee
5. Automated verification method of Korean word handwriting using geometric feature
   Woohyuk Jang, Sehee Kim, Yoonkyoung Kim, Eui Chul Lee
   Kunyoung Lee, Eui Chul Lee
7. Convolutional Neural Network based Serial Number Recognition Method for Indian Rupee Banknotes
   Unsoo Jang, Kun Ha Suh, Eui Chul Lee

12: 10-13: 30 Lunch
13:30-14:30 Keynote Speech
(HALL A)
(Chair:N/A)

Turtle Shell Based Information Hiding Mechanism

Chin-Chen Chang, Ph.D.
Professor of Feng Chia University Taichung, Taiwan

14:30-14:40 Coffee break

14:40-16:10 Session A-3 : CUTE
(HALL A)
(Chair:N/A)

1. An Analysis of Online Learning Tools based on Participatory Interaction: Focused the Minerva School Case Analysis (#63)
   Dae Hyun Lee, Yen-Woo You, Yong Kim
2. Fast Animation Crowds using GPU Shaders and Motion Capture Data
   Mankyu Sung
3. Ventricular Arrhythmia Classification Based on High-order Statistical Features of ECG Signals
   Sunghyun Moon, Jungjoon Kim
4. Compression and Variable-sized ECC scheme for the Reliable Flash Memory System
   Ki-jin Kim, Seung-Ho Lim
5. A New Direction-based Routing Protocol in WSNs
   Kyeong Mi Noh, JiSu Park, Jin Gon Shon
6. Multi-Chain PEGASIS in Wireless Sensor Networks Using Relative Distance and Differential Data Transfer
   Bok Gi Min, JiSu Park, Jin Gon Shon
7. Design and Implementation of an Enhanced Transaction Document Archive System
   Hyun Cheon Hwang, JiSu Park, Jin Gon Shon

14:40-16:10 Session B-3 : ATFC
(HALL B)
(Chair:N/A)

1. Multi-Scale Surface Curvature based on Mesh Simplification
   Jaeyong Lee, Kyong-Ah Kim, Yoo-Joo Choi
2. A Machine Learning Approach to Classification of Case Reports on Adverse Drug Reactions using Text Mining of Expert Opinions
   Hyon Hee Kim, Ki Yong Rhew
3. The Congestion Control Model for Unmanned Aircraft System Traffic Management
   Jung-In Choi, Seung-Hyun Seo, Taenam Cho
4. A Study on Local Consumer Behavior User Modeling for Extended O2O Services  
   Jinah Kim, Nammee Moon
5. User Modeling based on Smart Media Eye Tracking depending on the Type of Interior Space  
   Hye Jin Song, Nammee Moon
6. Indoor Location Recognition System using RSSI and BSSID  
   Sunmin Lee, Nammee Moon
7. An Ontology-based Approach to Finding Influential Topics of Scientific Articles by Combining Topic Modeling and Social Network Analysis  
   Hyon Hee Kim, Hey Young Rhee
8. Automatic base ontology generation from distributed domain knowledge  
   Jung Hyen Ahn, Young B Park

14:40-16:10 Session C-3 : CSA  
(HALL C)  
(Chair:N/A)

1. UBQUITOUS LEARNING AND DIGITAL BADGES IN THE AGE OF HYPER-CONNECTIVITY  
   Yoonil Auh, Heejung Raina Sim
2. Private Data Protection of Android Application  
   Jinseong Kim, Im Jung
3. A Distributed inVANETs-Based Intersection Traffic Control Algorithm  
   Iman Saeed, Mourad Elhadef
4. Sybil Attacks in Intelligent Vehicular Ad hoc networks: A Review  
   Aveen Muhamad, Mourad Elhadef
5. The Development of General-Purpose 3-D Visualization Analyzer for Big Data Repository  
   Jaesung Kim, Jeongcheol Lee, Sunil Ahn, Sik Lee, Kumwon Cho

14:40-16:10 Session D-3 : ISWP  
(HALL D)  
(Chair:N/A)

1. Crash risk prediction on arterial roads using the k-Nearest Neighbors algorithm  
   Min Ji Kang, Oh Hoon Kwon, Shin Hyoung Park

16:10-16:20 Coffee break

16:20-17:50 Session A-4 : CUTE  
(HALL A)  
(Chair:N/A)

1. An Integrated Evolutionary and Revolutionary Safety Analysis Methodology for Safety Critical Systems  
   Anit Thapaliya, Gihwon Kwon
2. A Study on Local Consumer  
Daehui Jeong, Gihwon Kwon

3. Comparing IO Visor and Pcap for Security Inspection of Traced Packets from SmartX Box  
Muhammad Ahmad Rathore, Aris Cahyadi Risdianto, Taekho Nam, JongWon Kim

4. Understanding Automated Continuous Integration for Containerized Smart Energy IoT-Cloud Service  
Chorwon Kim, Seungryong Kim, JongWon Kim

5. Comparing the Effectiveness of SFMEA and STPA in Software-Intensive Railway Level Crossing System  
Tung La-Ngoc, Gihwon Kwon

6. Vision Based Humanoid Control Using FIR Filter  
Kim Kwan Soo, Ahn Choon Ki

Session B-4 : SoReMo
(HALL B)
(Chair:N/A)

1. The microComponent and its Extension Patterns for Flexible Reuse of Software Artifacts  
Doohwan Kim, Jang-Eui Hong

2. Using Code Skeleton Patterns for Open Source Reuse  
Seungwoo Nam, Doohwan Kim, Jang-Eui Hong

3. Toward Offline Contents based Software R&D Support System  
Suntae Kim, Joongi Hong, Seounghan Song, Sangchul Choi, JeongAh Kim, Jae-Young Choi, Young-Hwa Cho

4. Visualization Approach for R&D Monitoring – A Tracking of Research Contents Changes Perspective  
Jae-Young Choi, Jong-Won Ko, Suntae Kim, Young-Hwa Cho

5. Internet Articles Classification by Type of Industry Based on TF-IDF  
Jonghun Cha, Jee-Hyong Lee

6. System for the Researcher Map to Promote Convergence Research  
Sangwon Hwang, Kangwon Seo, Woncheol Ryu, Youngkwang Nam

7. Towards Recovering Fault Traceability Links by Using Information Retrieval Technique  
Seungsuk Baek, Jung-Won Lee, Byungjeong Lee

Dusan Baek, Jong-Hwan Shin, Byungjeon Lee, Jung-Won Lee

9. Association-based Process Integration for Compliance with Core Standards in Development of Medical Software  
DongYeop KIM, Ye-Seul Park, Byungjeong Lee, Jung-Won Lee

10. Toward Providing Automatic Program Repair by Utilizing Topic-based Code Block Similarity  
Youngjun Jeong, Keyongsic Min, Geunseok Yang, Jung-Won Lee, Byungjeong Lee

Session C-4 : CSA
(HALL C)
1. Benchmark for efficient workload distribution between CPU and GPU according to the cache performance in on-die integration of GPU
   Beomjun Kim, Byung-Seok Shin

2. Developing Large amount of Data Conversion Algorithm in Hadoop for 3D printer
   Sungsk Kim, Sun Ok Yang, Kwangsik Chung, Heonchang Yu

3. A Health Management Service in Preventive Care for the Elderly
   Jian-Wei Li, Chang-Ju Yang, Chia-Ching Lin, Yi-Chun Chang, De-Yao Huang, Min-Xiong Xu

4. A Novel Genome Searching Approach for Analyzing BLAST Results of Whole Targeted Reads
   Jaehee Jung

5. Proposal of Container-based HPC Structures and Performance Analysis
   Yong Chanho, Na Sang-Ho, Lee Pill-Woo, Huh Eui-Nam

6. An Expression-invariant Facial Image Retrieval using SIFT and Gabor-LBP
   Sohee Park, Geonwoo Kim

18: 00-20: 00 Reception

Day 2, December 19, 2017 (Tuesday)

08: 40-09: 00 Registration

09: 00-10: 30 Session A-5 : CUTE (Chair:N/A)

1. Prototype Implementation of Site Visibility Framework employing IO Visor-based Packet Tracing
   Taekho Nam, JongWon Kim

2. Analysis of Recent Mobile Payment Trends
   Mansik Kim, Jungho Kang, Seokhong Min

3. Deep Learning-Based Intrusion Detection Systems for Intelligent Vehicular Ad Hoc Networks
   Ayesha Anzer, Mourad Elhadef

4. Enhanced Image Identifier Generation based on Luminance and Parallel Processing
   Mi-Eun Ko, Young B. Park, Je-Ho Park

5. A Study on Technology Trends for Industry 4.0; 3D Printing, Artificial Intelligence, Big Data, Cloud Computing, and Internet of Things
   Ki Woo Chun, Haedo Kim, Keonsoo Lee

6. A Fairness Resource Allocation for UAV Telecommunication Networks
   Wooyeob Lee, Daol Kim, Inwhee Joe
09: 00-10: 30  **Session B-5 : IRuH**  
(HALL B)  
(Chair:N/A)  
1. Security Mechanism in NFV using Light Weight PKI  
2. A Study on Adaptive Based HEVC 3D Multi-view Video Streaming over P2P Network  
3. Traffic Classifier for Long Range IoT Networking to Reduce Processing Loads  
4. Automated Realization of Service Function Chaining in Distributed Cloud  
5. Performance Comparison between GPU and CPU in CNN Learning Process  
6. A preliminary study on gait recognition between hemiplegic patients and normal people using a textile capacitive pressure sensor  
   Changwon Wang, Jonggab Ho, Daegyeom Kim, Young Kim, Se Dong Min

09: 00-10: 30  **Session C-5 : CSA**  
(HALL C)  
(Chair:N/A)  
1. The Hardware Design of 4x4 Block-based SAO for High-performance HEVC  
   Seungyong Park, Kwangki Ryoo  
2. Runtime Software Monitoring based on Binary Code Translation for Real-time Software  
   Kiho Choi, Seongseop Kim, Jeonghun Cho, Daejin Park  
3. A Lightweight Cryptographic Core for Encryption and Authentication  
   Dennis Gookyi, Kwangki Ryoo  
4. High Throughput ASIC Implementation of AES  
   Alexander O.A Antwi, Kwangki Ryoo  
5. Hardware Implementation of Elliptic Curve Integrated Encryption Scheme based on AES  
   Guard Kanda, Alexander Antwi, Kwangki Ryoo  
6. Efficient Hardware Design of Modular Exponentiation based on Montgomery Multiplier for Low Area RSA  
   Richard Boateng Nti, Kwangki Ryoo  
7. The Hardware Design of Adaptive Search Range Assignment for High Performance HEVC Encoder  
   Inhan Hwang, Kwangki Ryoo

09: 00-10: 30  **Session D-5 : CUTE**  
(HALL D)  
(Chair:N/A)  
1. Case Study of In-vehicle Infotainment Threat in Connected Car Environment  
   Joongyong Choi, Seong-il Jin  
2. The Implementation of Hand Detection using Convolutional Neural Network  
   Myeongsuk Pak, Sanghoon Kim  
3. Object Classifications in CCTV with Trajectory and Size Based on Neural Network  
   Taewoo Kim, Hyungheon Kim, Pyeongkang Kim, Yuna Lee
4. Information Communication Technology Convergence for Solar Energy Utilization
   Jihyun Lee, Youngmee Shin, Ilwoo Lee

5. Advanced Altitude Control Strategy for Rapid Target Detection
   Il-Kyu Ha

   Chen Der, Chen wei, Chien Lung, Tseng Pin, Chen Te

7. Accelerated purge processes of parallel file system on HPC by using MPI programming
   Min-Woo Kwon, JunWeon Yoon, TaeYoung Hong, ChanYeol Park

10: 30-10: 40 Coffee break

10: 40-12: 10 Session A-6 : CUTE
   (HALL A)  
   (Chair:N/A)

   1. A Study on K-means Algorithm based on PCA for Clustering of Multidimensional Non-labeling Big-data
      Jung SeHoon, Kim KyoungJong, Sim ChunBo

   2. A staged parallel line-sweep method for fast visibility detection in virtual terrain
      Hua Li, Chao Xu, Wei Quan, Jianping Zhao

   3. DoS Attacks and Countermeasures in VANETs
      Wedad Ahmed, Mourad Elhadef

   4. Smart home energy management model based on awareness things
      Hana Jo, Yong Ik Yoon

      Yong-Kyun Kim, Seoung-Hyeon Lee

10: 40-12: 10 Session B-6 : IRuH
   (HALL B)  
   (Chair:N/A)

   1. Algorithm for Cell Counting using Distance Transform and Radius Variation Analysis
      Sangjoon Lee, Donggeun Kim, Seokhoon Jeong, Jaeyoung Park, Taehoon Kim, Kuk Won Ko

   2. Intelligent Access Control in Access Points of Wireless Sensor Networks

   3. A Study on Reducing Entropy Rate of Adaptive Streaming Bitrate Fluctuation

   4. Analysis of the GNSS Navigation Message

   5. A Study of Auto Focus Algorithm for Cell Health Status Analysis

   6. A QoS Aggregation Mechanism for Virtual EPC using Service Chains

10: 40-12: 10 Session C-6 : CSA
   (HALL C)
1. The Lane Area Image-segmentation Algorithm Based on Statistics  
   Qi Qin, Xiaomei Xia, Yongtao Guo, Jin Wang
2. Setting Method of Integrated Waiting Area at Signalized Intersection  
   Xiaomei Xia, Xiaodan Ma, Jin Wang
3. Risk Analysis and Evaluation of Taxi Quota Adjustment  
   Jie Liu, Xiaodan Ma, Jin Wang
4. Sensing Range Adaptive Coverage Control Algorithm based on Particle Swarm  
   Algorithm for WSNs  
   Jin Wang, Yu Gao, Chunwei Ju, Gyeong-jin Kim, Jeong-Uk Kim
5. Chinese Character Segmentation with Fully Convolutional Network  
   Li Lin, Jin Liu, Zhenkai Gu, Jin Wang, Gyeong-jin Kim, Jeong-Uk Kim
6. Character Area Detection in Natural Background  
   Yunhui Li, Jin Liu, Jin Wang, Gyeong-jin Kim, Jeong-Uk Kim

10: 40-12: 10 Session D-6 : CSA  
(HALL D)  
(Chair:N/A)
1. Application of outlier detection in bus digital tachograph data for estimating  
   fuel consumption of intracity bus  
   Oh Hoon Kwon, Yongjin Park, Shin Hyoung Park
2. Location based Attendance Verification for Retailers  
   Cheol Shim, Min Choi
3. Improvement of Usability Assessment on User Satisfaction in Multiple Devices  
   Jeyoun Dong, Myunghwan Byun
4. A study on Ownership Management Scheme Using Linkage of Data Blocks in  
   Secure Data Deduplication Environments  
   Won-Bin Kim, Im-Yeong Lee
5. Security Consideration of Fuzzy Vault based on Photoplethysmogram  
   Juyoung Kim, Kwantae Cho, Sang Uk Shin
6. Recovery of Peak Misdetection for IPI-based Key Exchange  
   Juyoung Kim, Kwantae Cho, Yong-Kyun Kim, Kyung-Soo Lim, Sang Uk Shin
7. Location Privacy for HIP based Internet of Things  
   Kyung Choi, Mihui Kim

12: 10-13: 30 Lunch

13: 30-15: 00 Session A-7 : CUTE  
(HALL A)  
(Chair:N/A)
1. Vehicular Architecture for lowering the Barriers to Applications of Cloud-  
   Based Vehicular Network.  
   Lionel Nkenyereye, Jong-Wook Jang
2. Analysis of Pixel and Sub-pixel Accurate Shadow Techniques  
   Hua Li, Huamin Yang, Chunyi Chen, Jianping Zhao
3. Real-time Pose estimation using Fiducial Marker Detection for Efficient
Collaboration between Drone and Ground Vehicle
Jong Hwan Beck, Myeong Suk Pak, Sang Hoon Kim

4. A Reduction of Middle Letters Glyphs for Jeongeum-Font
Seongbum Hong, Hoyoung Kim, Gayeon Kim, Jeongyong Byun

5. A Secure Operating System Architecture based on Linux against Communication Offense with Root Exploit for Unmanned Aerial Vehicle
Kwangmin Koo, Wooyeob Lee, Sung-Ryung Cho, Inwhee Joe

6. Path Privacy Preservation using Threshold Secret Sharing via Distributed Obfuscators in Directions Search
Mihui Kim

7. IPC Multi-label Classification Applying the Characteristics of Patent Documents
Sora Lim, YongJin Kwon

13: 30-15: 00 Session B-7 : IRuH
(HALL B)
(Chair:N/A)

1. A Multi-Path Security-aware Routing Scheme in Mobile Ad-hoc Networks
2. Open Source based Neutralized Network Operating System (OpenN2OS) for NFV platform
3. A Research on an Intelligent Urban Disaster Control with an Integrated Management and Monitoring System Using IoT Smart Sensors
4. Android Application based practical implementation of Scream Recognition System
5. A Page Turner Application based on the OpenCV for Various Performing Artists
6. Fairness Maximization aware Diversified Experts Recruitment for Crowdsourcing
Fei Hao, Doo-Soon Park

13: 30-15: 00 Session C-7 : CSA
(HALL C)
(Chair:N/A)

1. Entity Attribute Extraction Based on Distant Supervision and LSTM
Xiaohu Tian, Jin Liu, Wenzhao Yao, Jin Wang, Gyeong-jin Kim, Jeong-Uk Kim

2. A Novel Feature Weighting Scheme Leveraging Emotional Words in Twitter Sentiment Analysis
Yili Wang, Le Sun, Jin Wang, Hee Yong Youn

3. Hyperspectral Mixed Denoising via Cross Total Variation and Weighted Low Rank Decomposition
Le Sun, Jin Wang, Byeungwoo Jeon

Le Sun, Jin Wang

Lian Xia, Chunyong Yin, Jin Wang

6. An Improved Method in Deep Packet Inspection Based on Regular Expression  
Ruxia Sun, Lingfeng Shi, Chunyong Yin, Jin Wang

7. Application of Sub-lattice Binary Search in Personal Information Protection  
Xiaokang Ju, Hongyi Wang, Chunyong Yin, Jin Wang

13:30-15:00 Session D-7: HRH  
(HALL D)  
(Chair:N/A)

1. Communication System of e-Navigation between Vessel and Shore utilizing Representation State Transfer at Sea  
Teahoon Koh, Yonghoon Kim, Kamyoung Park, Jeongho Lee, Kyungryong Seo

2. Traffic Prediction System utilizing Application and Control of Environmental Information  
Yonghoon Kim, Mokdong Chung

Sangdo Lee, Le Hoanh Su, Jun-Ho Huh

Jun-Ho Huh, Sangdo Lee, Kyungryong Seo

5. The Effect of Business Environment Factors on Business Strategy and Business Performance  
Wonhyun So, Hakyun Kim

6. Corporate Social Responsibility and Its Effect on the Social Environment and Corporate Value  
Wonhyun So, Hakyun Kim

7. The Effect of Information Welfare Policies on the Activation of Information Welfare and Information Satisfaction  
Wonguen So, Hakyun Kim

8. Demand Response Resource Energy Optimization System for Smart Home  
Sooyoung Jung

Sooyoung Jung

15:00-18:00 Break

18:00-20:00 Banquet

Day 3, December 20, 2017 (Wednesday)
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00-12:00</td>
<td>CSA - Organizing Committee Meeting</td>
</tr>
<tr>
<td>13:00-15:00</td>
<td>CUTE - Organizing Committee Meeting</td>
</tr>
<tr>
<td>15:00-17:00</td>
<td>Local Arrangement Committee Meeting</td>
</tr>
</tbody>
</table>
Conference Venue

Providence University

• Address: No. 689, Sec. 2, Taiwan Boulevard, Xitun Dist., Taichung City, 407 Taiwan
• Phone: +886-4-2326-8008

HOW TO GET TO PROVIDENCE UNIVERSITY?

I. By car

A. Through National Freeway No.1
(Both Northbound and Southbound) Drive along National Freeway No.1, then, take the exit at Jhonggang Interchange (178.6km) and follow the direction to Shalu. Drive along Taiwan Boulevard (about 11 km) and you'll see Providence University on the right.

B. Through National Freeway No.3
1. Northbound From National Freeway No.3, take the exit at Longjing Interchange (182.8 km) and follow the direction to Taichung, turn left at the first traffic light (about 700m after exit) and follow the direction to Shalu. Turn left at Taiwan Boulevard (about 4km) and you'll see Providence University on the right.
2. Southbound From National Freeway No.3, take the exit at Shalu Interchange (176.1 km) and follow the direction to Shalu then turn left at Taiwan Boulevard (about 2km) and you'll see Providence University on the left.
II. By Bus

A. From Chaoma Station
From Chaoma, take the local bus, such as Juye Bus (which goes to Dajia, Chingshuei,) or Dajiahang Bus. It takes about 20 minutes to get to Providence University.

B. From Taichung Train Station
From Taichung Train Station take Juye Bus (which goes to Dajia, Chingshuei, at Jianguo Road, get off at Providence University. It takes about 50 minutes to get to Providence University.

III. By Train (Taiwan Railway Administration Time Table Query System)

A. Mount Line
Get off at Taichung Station and take Juye Bus (which goes to Dajia, Chingshuei) at Jianguo Road, then get off at Providence University. It takes about 50 minutes to get to Providence University.

B. SEA Line
From Shalu Station, either take a taxi or a bus to Providence University.
(1) by taxi: It costs about NT$150.
(2) by bus: From Juye Bus Shalu Main Station at Jung Shang Rd. take the bus which goes to Taichung, then get off at Providence University. It takes about 10 minutes to get to Providence University.

IV. By Taiwan High Speed Rail
Get off at the Taichung Station. From Taichung Station, take a taxi to Providence University. It costs about NT$500.
Hotel information

- **Tempus Hotel**
- Address: No. 689, Sec. 2, Taiwan Boulevard, Xitun Dist., Taichung City, 407 Taiwan
- Phone: +886-4-2326-8008
- FAX: +886-4-2326-8060

Tempus Hotel Taichung is situated in the center of Taichung’s commercial, business, and shopping district. It is about 10~20 minutes by car from the National Highway No.1 interchange, making it easily accessible from Northern and Southern Taiwan. With the convenience of the Taiwan High Speed Rail, Taichung is only one hour away from Taipei and Kaohsiung, making the city a central hub of Western Taiwan. Be it business, entertainment, shopping or sightseeing, Tempus Hotel is but a heartbeat away.

**Via Car** From the National Highway No. 1 interchange, follow Taichung Port Road and head towards Taichung city center. Turn right at DongXing Road and the hotel will be on your right about one block down. The total trip time is around 5~10 minutes.

**Via Train (From Taichung Station)**
1. Taxi: The total trip time is around 15~20 minutes and the fare will be approximately NT$150
2. City Bus: Take Renyou Bus 48, Taichung City Bus 70, 88, Taichung Highway Bus 106, 147. Get off at DingHeCuo or HeCuo Station
3. Chartered Bus: Take Taichung TTJ Bus ZhongGang Line (purple) 83 and get off at DingHeCuo or HeCuo Station.

**Via Airplane**
1. Taxi from Taoyuan International Airport: The total trip time is around 2 hours and the fare will be approximately NT$3,000. We will charge according to the actual costs.
2. Chartered Bus (Kuo-Kuang Bus): The total trip time is around 2.5 hours and the fare will depend on current company prices.
3. Taxi from Taichung Airport: The total trip time is around 50~60 minutes and the fare will be approximately NT$500.
4. Please contact Tempus Hotel Taichung regarding its pick-up service at an additional charge. For further details and assistance, please call (04)2326-8008 and ask for the
Concierge.

**Via Taiwan High Speed Rail (THSR) [Taichung Station → Tempus Hotel Taichung]**  
1. Taichung Station Bus and Transfer Information: THSR Bus – Exit 6; Taiwan Railway – Exit 3; Various express city buses – Exit 5, 6; Taxi service – Exit 7, left side.  
Free THSR Shuttle Bus Available from 07:35 to 00:10 – One bus every 15~20 minutes and the total trip time is around 30 minutes; closest stop to Tempus Hotel Taichung is SOGO Department Store, which is around 5~10 minutes from the hotel via car.  
3. Taxi Service Total trip time is around 20~30 minutes and the fare is approximately NT$250.  
4. Please contact Tempus Hotel Taichung regarding its pick-up service at an additional charge.  
For further details and assistance, please call (04)2326-8008 and ask for the Concierge.