

The 2016 World Congress on Information Technology Applications and Services

**"Advanced Mobile, Communications, Security,
Multimedia, Vehicular, Cloud, IoT, and Computing"**

February 17-19, 2016
Jeju, Korea

Organized by

World IT Congress & KIPS SWRG



2016 International Conferences
(Sponsored / Technically Sponsored by KIPS / KIPS SWRG)

December 16-18, Jakarta, Indonesia

- The 8th International Conference on Computer Science and its Applications (CSA-16)
- The 12th International Conference on Ubiquitous Information Technologies and Applications (CUTE-16)

August 23-25, Jeju, Korea

International Jeju Joint Conferences 2016

- The 5th International Conference on Ubiquitous Computing Applications and Wireless Sensor Network (UCAWSN-16)
- The 2016 International Conference on Advanced Information Technology and Services (InfoTech 2016)
- The 8th International Conference on Information Technology Convergence and Services (ITCS 2016)
- The 13rd International Conference on Secure and Trust Computing, data management, and Applications (STA 2016)

June 28-30, Milano, Italy

- The 2016 International Conference on Human-centric Computing (HumanCom-16)

April 20-22, 2016, Beijing, China

- The 11th International Conference on Multimedia and Ubiquitous Engineering (MUE 2016)

February 17-19, Jeju, Korea

World IT Congress 2016 – Jeju Korea

Jan. 13-15, Las Vegas, USA

- The 2016 Global Conference on Information Technology, Computing, and Applications(Global IT 2016) Hawaii, USA, January 12~14, 2016 <http://www.globalitconf.org/2016>



Message from the World IT Congress 2016 General Chairs

The 2016 World Congress on Information Technology Applications and Services "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing" will be held in Jeju, Korea on Feb 17~19, 2016. The World IT Congress 2016 Jeju is aimed at address key themes on "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing". World IT 2016 will be the most comprehensive conference focused on Information Technology, computing, and applications, and will provide an opportunity for academic and industry professionals to discuss the latest issues and progress in the area of Advances in IT, Applications, and Services (AITA). In addition, the conference will publish high quality papers which are closely related to the various theories and practical applications in advanced IT. Furthermore, we expect that the conference and its publications will be a trigger for further related research and technology improvements in this important subject.

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 Committee, Doo-Soon Park (SoonChunHyang University, Korea). Our special thanks go to the Program Chairs, 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.

World IT Congress 2016
General Chairs

Deok-Gyu Lee, Seowon University, Korea
Nazim Agoulmine, University of Evry, France
Joon-Min Gil, Catholic University of Daegu, Korea
Qun Jin, Waseda University, Japan
V. Clincy, Kennesaw State University, USA
Wanlei Zhou, Deakin University, Australia



Message from the World IT Congress 2016 Program Chairs

Welcome to the 2016 World Congress on Information Technology Applications and Services "Advanced Mobile, Communications, Security, Multimedia, Vehicular, Cloud, IoT, and Computing" which will be held in Jeju, Korea on Feb 17~19, 2016. This congress will be the most comprehensive conference focused on the various aspects of Advances in IT, Applications, and Services (AITA).

The World IT 2016 provides an opportunity for academic and industry professionals to discuss the latest issues and progress in the area of Computer Science. In addition, the conference contains high quality papers which are closely related to the various theories and practical applications in Computer Science. Furthermore, we expect that the conference and its publications will be a trigger for further related research and technology improvements in this important subject. The World IT 2016 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 Doo-Soon Park (SoonChunHyang University, Korea), James J. Park, SeoulTech, Korea and Young-Sik Jeong, Dongguk University, Korea the Steering Committee of World IT for their strong encouragement and guidance to organize the conference. We would like to thank World IT 2016 General Chairs for their advices to make possible organization of The World IT 2016. We would like to express special thanks to execute members for their timely unlimited support.

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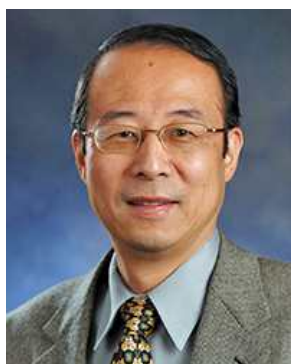
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Eun-Young Park, Hyupsung University, South Korea
Kwang-Il Hwang, Incheon National University, Korea

Invited Speaker



Parallel Computing on Clouds— Issues and Solutions

Dr. Yi Pan

Regents' Professor of Computer Science
Associate Dean and Chair
Georgia State University
Atlanta, Georgia, USA
<http://www.cs.gsu.edu/pan>

Abstract

Cloud computing has emerged rapidly as a growing paradigm of on-demand access to computing, data and software utilities using a usage-based billing model. Users essentially rent resources and pay for what they use and everything including software, platform, and infrastructure is as a service. Many massive data applications including data mining should be the ideal applications on cloud platforms. However, with the current cloud programming models, complicated data mining algorithms cannot be implemented easily and executed efficiently on the many cloud platforms. In this talk, I will give a review of different massively parallel computing platforms and compare various computing domains and programming models on these platforms, their limitations and potential solutions. In particular, I will point out the shortcomings and limitations of current cloud computing programming models for typical scientific algorithms, and propose possible solutions. Current MapReduce model and its variants have succeeded in data-parallel applications such as database operations and web searching; however, they are still not effective for applications with a lot of data dependency. We propose several approaches to solving this problem through extension of current programming models, automatic translation from sequential codes to cloud codes, simple API and framework built on current cloud models, detection of data and task parallelism, and their efficient scheduling. In particular, two code translators for parallel computing on clouds (M2M and J2M) will be introduced. Some preliminary theoretical and experimental results will also be reported in this talk.

Biography

Yi Pan is a Regents' Professor and a Distinguished University Professor of Computer Science and an Associate Dean at Georgia State University, USA. He is also a visiting Changjiang Chair Professor at Central South University, China. Dr. Pan received his B.Eng. and M.Eng. degrees in computer engineering from Tsinghua University, China, in 1982 and 1984, respectively, and his Ph.D. degree in computer science from the University of Pittsburgh, USA, in 1991. His profile has been featured as a distinguished alumnus in both Tsinghua Alumni Newsletter and University of Pittsburgh CS Alumni Newsletter. Dr. Pan's research interests include parallel and cloud computing, wireless networks, and bioinformatics. Dr. Pan has published more than 180 journal papers with over 60 papers published in various IEEE journals. In addition, he has published over 150 papers in refereed conferences. He has also co-authored/co-edited 40 books. His work has been cited more than 6500 times. Dr. Pan has served as an editor-in-chief or editorial board member for 15 journals including 7 IEEE Transactions. He is the recipient of many awards including IEEE Transactions Best Paper Award, IBM Faculty Award, JSPS Senior Invitation Fellowship, IEEE BIBE Outstanding Achievement Award, NSF Research Opportunity Award, and AFOSR Summer Faculty Research Fellowship. He has organized many international conferences and delivered keynote speeches at over 50 international conferences around the world.

PROGRAM SCHEDULE FOR WORLD IT CONGRESS 2016

Day 1, Feb. 17, 2016			
Time	Min	HALL -A	HALL B
08:40-09:00	20	Registration	
09:00-10:30	90	Session A-1 Chair : Kwang-Sik Chung	Session B-1 World-IT, NSF Chair : Sangkee Suk
10:30-10:40	10	Coffee Break	
10:40-12:10	90	Session A-2 Chair : Hwamin Lee	Session B-2 World-IT, ARNIT Chair : Joon-Min Gil
12:10-13:30	80	Lunch	
13:30-14:30	60	Keynote Speech (Chair: Kwang-il Hwang) “Parallel Computing on Clouds— Issues and Solutions” Dr. Yi Pan Regents’ Professor of Computer Science, Associate Dean and Chair Georgia State University, Atlanta, Georgia, USA	
14:30-14:40	10	Coffee Break	
14:40-16:10	90	Session A-3 Chair : Sang-Seon Byun	Session B-3 Chair : JongBeom Lim
16:10-16:20	10	Coffee Break	
16:20-15:30	100	Session A-4 Chair : Yunsick Sung	Session B-4 Chair : Dongkyun Kim
18:00		Banquet (HALL B)	

Day 2, Feb. 18, 2016		
Time	Min	HALL -A
09:00-12:00	240	Local Arrangement Committee Meeting
13:00-15:00	120	Organizing Committee Meeting I
16:00-17:00	60	Executive Meeting I - Organized by World IT 2016

[ONLY FOR INVITED MEMBERS]



Day 3, Feb. 19, 2016		
Time	Min	HALL -A
09:00-12:00	240	Organizing Committee Meeting II
13:00-15:00	120	Executive Meeting II - Organized by World IT 2016
16:00-17:00	60	Organizing Committee Meeting III

[ONLY FOR INVITED MEMBERS]

1. A paper presentation should be made by one of authors of the paper for 20 minutes (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 2016 WORLD CONGRESS ON
INFORMATION TECHNOLOGY, APPLICATIONS
AND SERVICES**

(WORLD IT CONGRESS 2016)

Day 1, Feb. 17, 2016 (Wednesday)

08:40-09:00 Registration

**09:00-10:30 Session A-1 World-IT 2016
(HALL A)
(Chair: Kwang-Sik Chung)**

- 1. Dynamic Virtual Machine Allocation Algorithm for Heterogeneous Server Environment**
Junho Eum, Hong Jae Kim, Minsoo Yang, Sangyoon Oh
- 2. Study on Inspection of Website Vulnerability and Risk Assessment Method**
HanChul Bae, JongHun Jung, HwanKuk Kim, SangHwan Oh
- 3. Semantic Web Enabled Search Engine for Big Data**
Aziz Nasridinov, Kwan-Hee Yoo
- 4. Skyline Query Processing with Quantitative Equipartitioning over MapReduce Framework**
Jaehwa Chung
- 5. Design and Implementation of Security Agent System Based on DRM**
Yongwan Ju, Seungsu Yang, Seokcheon Park
- 6. Quickest Detection of Primary Signal in Cognitive Radio Network: A Clustered Approach**
Muhammad Sajjad Khan, Muhammad Usman, Insoo Koo
- 7. High-Capacity Data Hiding Scheme by Exploiting Modification Direction and Modulus Operation**
Pyung-Han Kim, Ki-Hyun Jung

**09:00-10:30 Session B-1 NSF 2016, World-IT 2016
(HALL B)
(Chair: Sangkee Suk)**

- 1. An Efficient Multi-Authentication Method based on the Merkle Hash Tree for the Smart Home Environments**
Mansik Kim, Won-kyu Choi, Moon-seog Jun
- 2. A Design of Block Chain-Based P2P Energy Loan in Smart Grid Environment**
Minjin Kim, Seokhwa Song, Moon-seog Jun

3. **Broker based Secure Mutual Authentication for Multi Cloud**
Bumryong Kim, Keunchang Choi, Moon-seog Jun
4. **Design of Secure Authentication Method based on PUFs and Zero-knowledge Proofs in VANET Environments**
Hyungjoo Kim, Jungho Kang
5. **Study of Crash Analysis and Data Flow Analysis for Exploitable Assessment Method on Software**
Jun-Ho Song, Jae-Pye Park, Moon-Seog Jun
6. **Light-Weight Authentication and Key Exchange Routing Protocol Based on LEACH for Energy Efficient in Sensor Network Environments**
Jaeseung Lee, Ayoung Lee, Moonseog Jun
7. **A Nonlinear Content Based Image Retrieval Paradigm**
Guang-Ho Cha
8. **Design of a Medical Waveform Encoder with Fixed Length**
Yonghee Lee, Sunho Kim, Kangwoo Lee

10:30-10:40 Coffee break

10:40-12:10 **Session A-2 World-IT 2016**
(HALL A)
(Chair: Hwamin Lee)

1. **Secure Blind Auction using Homomorphic Encryption**
Jong-Hyuk Im, Taek-Young Youn, Mun-Kyu Lee
2. **Optimal Dataflow of the Hadoop Shuffle Phase for Superlinear Scalability**
JongBeom Lim, Jong-Suk Ahn, Kang-Woo Lee
3. **Reducing the Dimensionality of Spectro-Temporal Data by Factor Analysis: A Case Study**
Shingchern You, Ming-Jen Hung
4. **Volume Illumination Reflecting Material Properties**
Byeonghun Lee, Young-Sik Jeoung, Byeong-Seok Shin
5. **On Soft Computing Techniques for Social Networks Analysis: A Survey**
Fei Hao, Doo-Soon Park, Zheng Pei, Min Jeong Kim
6. **Design and Implementation of an Online Dictionary**
Kaewsuwan Tanumporn, Seung-Seok Kang, Jaeseung Kim, Seongbin Park
7. **Design and Development of Real-time Casual Game on Android**
Unil Yun, Jinkyu Hwang, Heungmo Ryang
8. **Design Methodology for Improved Security in the EHR Environment**
Seung-Han Lee, ByungWook Jin, Seung-Min Yang

10:40-12:10 **Session B-2 ARNIT 2016, World-IT 2016**
(HALL B)
(Chair: Joon-Min Gil)

1. **Design of Cloud based on Wireless Network Authentication System**
Hyungju Lee, Yonghwan Jung, Heang-gon Lee, Jangwon Choi, Hyunhun Cho

2. **64 Processing Elements with Multiaccess Memory System to Speedup Image Correlation**
Jae-Hee Kim, Kyung-Sik Ko, Chung Shick Oh, Jong Won Park
3. **Method of Indoor Localization using Signal Indication for the Internet of Things**
Seunghae Kim, Joon-Min Gil, Jinhyung Park
4. **A Study on Spread of Malicious Code through Concealment Sites and its Prevention**
Seung-Yup Jun, Hyun-Il KIM, Chang-ho Seo
5. **A DDoS Detection Scheme using Entropy of Flows Properties in ISP Domain**
Wan-Young Heo, Jinhyung Park, Chung Shick Oh, Gi-Hwan Cho
6. **Personal information analysis using digital forensic on cloud**
ChanJin Park
7. **Introduction to Windows Memory Forensic System for Cyber Incident Analysis**
Hyunwook Park, Sunoh Choi, Jong-Hyun Kim, Dong-Il Seo, Ikkyun Kim
8. **Georeferenced 3D building modelling from panoramic image sequence and digital map**
Hyungki Kim, Yuna Kang, Soonhung Han

12:10-13:30 **Lunch break**

13:30-14:30 **Keynote Speech**

(HALL A)

(Chair: Kwang-il Hwang)

“Parallel Computing on Clouds— Issues and Solutions”

Dr. Yi Pan

Regents' Professor of Computer Science, Associate Dean and Chair
Georgia State University, Atlanta, Georgia, USA

14:30-14:40 **Coffee break**

14:40-16:10 **Session A-3 World-IT 2016**

(HALL A)

(Chair: Sang-Seon Byun)

1. **Transition System Semantics of Finite and Real-Time DEVS Models**
Hae Young Lee
2. **IT adaptation and infusion: A systematic literature review and research agenda**
Azizbek Marakhimov, Jaehun Joo
3. **Data classification scoring algorithm and adaptive data management module in Object Storage**
Young-Sun Youn, Su-Kyung Yoon, Jung-Geun Kim, Shin-Dug Kim
4. **A New User Interface Scheme for Web/Mobile-based 3D Printing Applications**
Joo-young Do, Nakhoon Baek
5. **Client-Side Deduplication for Protect of a Private Data in Cloud Storage**
Won-Bin Kim, Im-Yeong Lee
6. **Transaction Database Sanitization Methods for Privacy Preserving Utility Mining**
Donggyu Kim, Unil Yun, Heungmo Ryang
7. **A New Weighted Frequent Graph Mining Approach considering Length-Decreasing Support**

Constraints based on Weighted Smallest Valid Extension

Gangin Lee, Unil Yun, Donggyu Kim

14:40-16:10 Session B-3 World-IT 2016

(HALL B)

(Chair: JongBeom Lim)

- 1. Performance Analysis for IEEE 802.15.7 Visible Light Communication**
Ha-Ra Oh, Jung-Hyok Kwon, Jieun Jang, Seonghyun Jang, Eui-Jik Kim
- 2. Higher Education Institutions Attractiveness Early Warning Based on Social Media Indicators**
Vasiliy Kuznetsov, Olga Yugay, Dilnoza Muslimova
- 3. An Effective Sensor Data Collecting Scheme in Wireless Sensor Network**
Kilhung Lee
- 4. In-System Outlier Smoothing for Real-time Air Quality Monitoring**
Kwang-il Hwang, MinSik Kim, Seung-Kyu Park
- 5. A State-Aware Backoff Algorithm for IEEE 802.11**
Dongjun Jang, Jongsuk Ahn
- 6. Smart Steering Wheel Cover for Vehicle Using the OBD Data Analysis**
Sangwook Han, Eunkwang Jeon, Jungyeon Seo, Min Hong, Hwamin Lee
- 7. Dynamic Observing Period Adjustment for CoAP**
Sungmo Kim, Jung-Hyok Kwon, Hwi-Ho Lee, Minki Cha, SolBee Lee, Eui-Jik Kim

16:10-16:20 Coffee break

16:20-15:30 Session A-4 World-IT 2016

(HALL A)

(Chair: Yunsick Sung)

- 1. Software Integrity Verification System based on Mobile Storage**
Su-Wan Park, Jeong Nyeo Kim
- 2. Enhanced Filter-Based Relative Distance Estimation Method**
Sang-Geol Lee, Jong Hyuk Park, Yunsick Sung
- 3. A Study on the Vehicle Black Box System for the Day and Night Accident Prevention**
Kang Hyo Kim, Hae-Min Moon, Sung Bum Pan
- 4. Determinants of Intention to Use the Online-Only Bank Based on UTAUT and Interaction Effects**
Young-Ho Hwang, Yoo-Jin Moon
- 5. A Recording and Sharing Platform of Vehicle Driving Video using Smartphones**
Dongmahn Seo, Joon-Min Gil
- 6. Comparison and analysis of ECC and RSA in MongoDB**
Saurabh Singh, Seo Yeon Moon, Jong Hyuk Park
- 7. Stochastic Interference Control by Stochastic Market Equilibrium**
Sang-Seon Byun, Joon-Min Gil
- 8. Source code plagiarism management system**
Gangman Yi

9. Realistic Audio Effect for Implementation of Real Time FTV

Tae-Il Cho, Jong-Un Kim, Sung-Dae Yeo, Goo-Man Kim, Seong-Kweon Kim

10. Iterative Image Dehazing Using the Dark Channel Prior

Seung-Won Jung

16:20-15:30 Session B-4 World-IT 2016

(HALL B)

(Chair: Dongkyun Kim)

1. Towards Safest Path using Statistical Analysis

Aziz Nasridinov, Kwan-Hee Yoo

2. Estimate on the Low Birth Policy Demand based on Social Big Data

Tae Min Song, Ki Ho Lee

3. Development of Virtual Dedicate Network based on Software-Defined Wide Area Network

Dongkyun Kim, Hyunhun Cho, Joon-Min Gil

4. Extending Lifetime of the Sensor Network Assisted Cognitive Radio Network

Saeed Ahmed, Muhammad Usman, V. V. Hiep, Insoo Koo

5. Intrusion Detection using Skylines

Saydiolim Ganiev, Aziz Nasridinov, Jeong-Yong Byun

6. Novel (2, 2)-threshold Random grid-based Visual Secret Sharing

Rosemary Koikara, Anneke Soraya Hidayat, Anand Paul, Kee-Young Yoo

7. Design of Walking Drone for Surveillance

Jong-Hwan Beck, Myeong-Sook Pak, Jin-Seong Jeon, Sanghoon Kim

8. Performance Evaluation for Top-K High Utility Itemset Mining Methods

Heungmo Ryang, Unil Yun, Gangin Lee

9. Performance Analysis of Frequent Pattern Mining Methods on Transactional Uncertain Databases

Unil Yun, Gangin Lee, Donggyu Kim

10. Researching Hama for Big Data and High Performance Computing

Kamran Siddique, Zahid Akhtar, Yangwoo Kim

18:00 Banquet [HALL-B]

Day 2, Feb. 18, 2016 (Thursday)

- 09:00-12:00 Local Arrangement Committee Meeting
- 13:00-15:00 Organizing Committee Meeting I
- 16:00-17:00 Executive Meeting I - Organized by World IT 2016

Day 3, Feb. 19, 2016 (Friday)

- 09:00-12:00 Organizing Committee Meeting II
- 13:00-15:00 Executive Meeting II - Organized by World IT 2016
- 16:00-17:00 Organizing Committee Meeting III

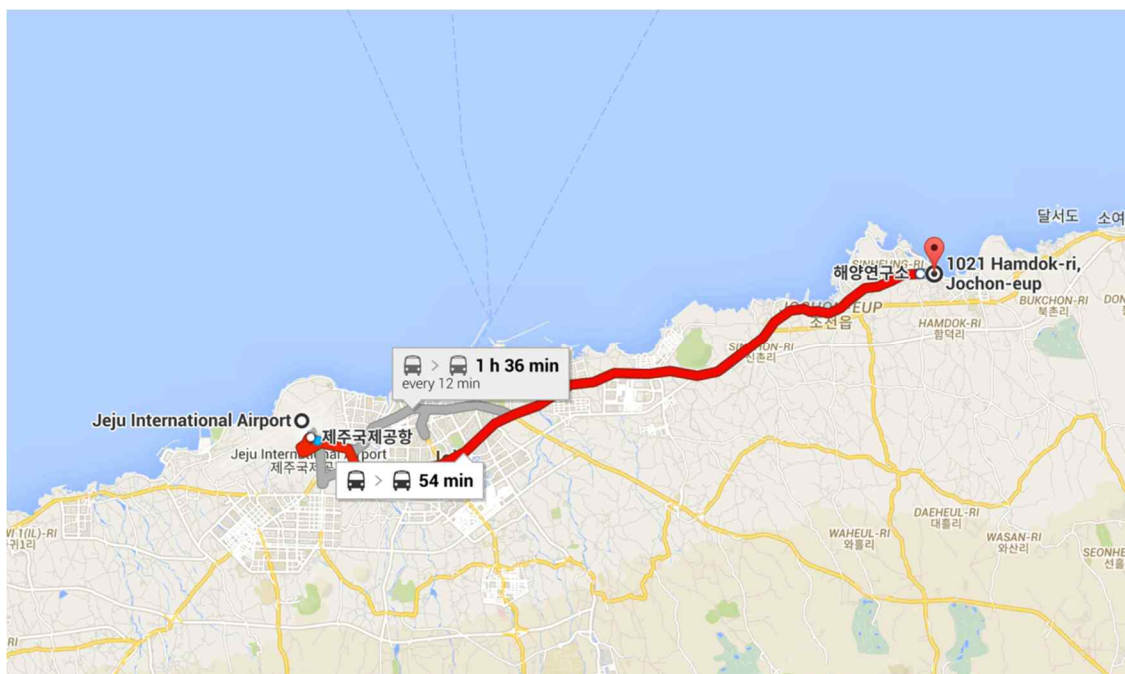
Conference Venue



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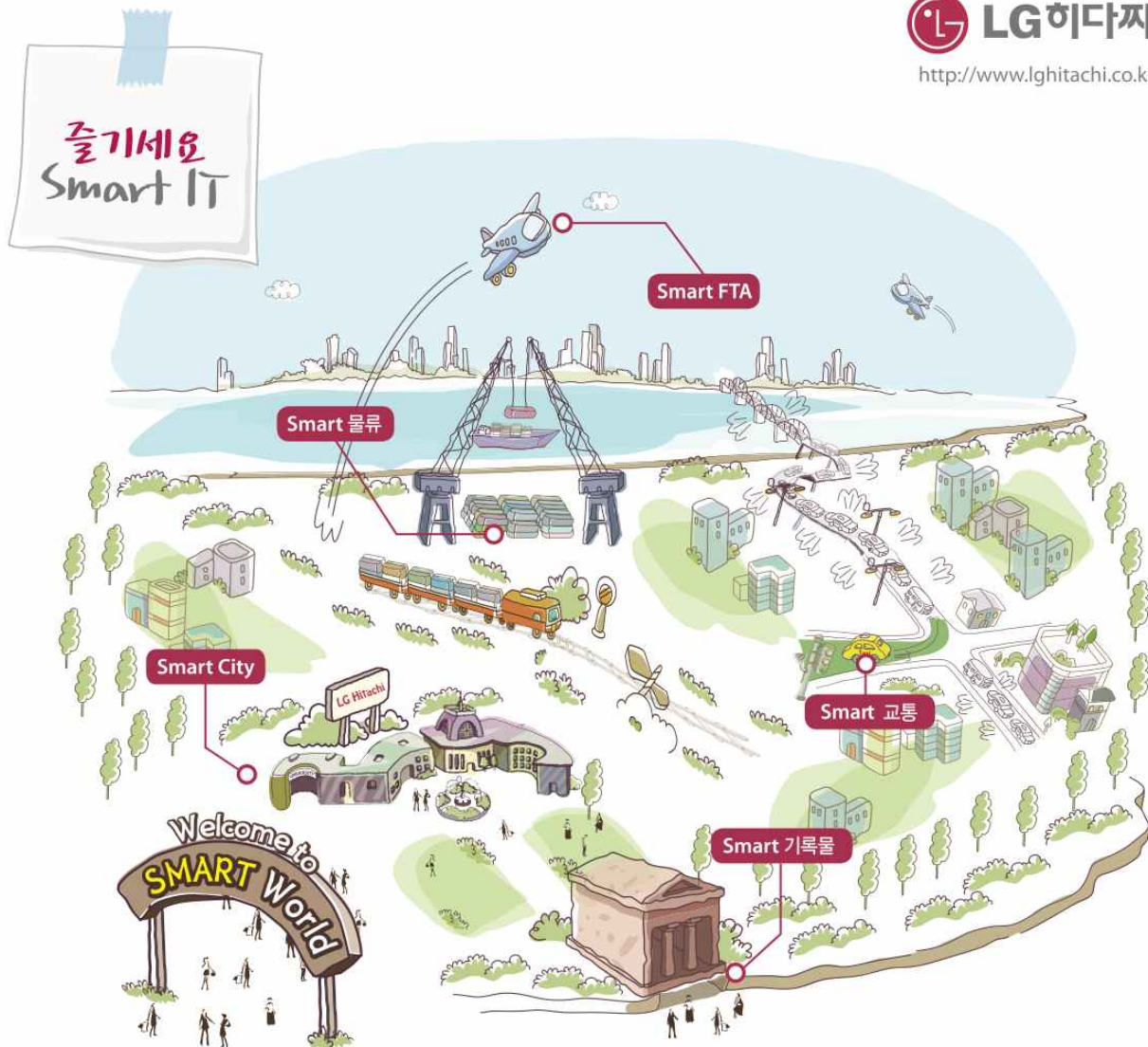


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