The 3rd International Conference on Innovative Computing (IC 2020)

Co-located Conferences

The International Workshop on Future Technology (FUTECH 2020)
The 4th International Conference on Big-data, IoT, Cloud computing Technologies and Applications (BICTA 2020)

IC 2020
Final Program

Ho Chi Minh City, VIETNAM
JANUARY 14-17, 2020

Organized by

Frontier Computing Conference Group

Message from Organizing Committees

The International Conference on Innovative Computing (IC 2020) will be held in Vietnam, Ho Chi Minh City, 14 - 17, January 2020. This event is the 3rd event of the conference series, in which fruitful results can be found in IC2015 (Xiamen, China), IC2016 (Taichung, Taiwan). Each event brings the researchers worldwide together to have excited and fruitful discussions as well as future collaborations. This conference series aims at providing an open forum to reach a comprehensive understanding of the recent advances and emergence in information technology, science, and engineering.

There are two international workshop and international conference are jointly operated with IC2020 at the same time and place, i.e., The International Workshop on Future Technology (FUTECH 2020), and The 4th International Conference on Big-data, IoT, Cloud computing Technologies and Applications (BICTA 2020), which are organized by FC conference group and Korean Institute of Information Technology, Korea Institute of information technology and innovation (KIITI) and SIEC Korea Chapter.

The papers accepted for inclusion in the conference proceeding primarily cover the topics: database and data mining, networking and communications, web and internet of things, embedded system, soft computing, social network analysis, security and privacy, optics communication, and ubiquitous and pervasive computing. Many papers have shown their great academic potential and value and indicate promising directions of research in the focused realm of this conference series. We believe that the presentations of these accepted papers will be more exciting than the papers themselves, and lead to creative and innovative applications. We hope that the attendees (and readers as well) will find these results useful and inspiring to your field of specialization and future research.

On behalf of the organizing committee, we would like to thank the members of the organizing and the program committees, the authors, and the speakers for their dedication and contributions that make this conference possible. In this year's IC2020. We appreciate the contributions from these experts and scholars to enrich our IC2020. We would like to thank and welcome all participants to Vietnam, Ho Chi Minh City. Ho Chi Minh City, formerly known as Saigon, once "The Pearl of the Far East" is the second-largest city in Vietnam. Ho Chi Minh City is a popular tourist destination due to its fascinating culture, classic French architecture, and sleek skyscrapers as well as ornate temples and pagodas. The city is also filled with rooftop bars that overlook Saigon and beyond, while fantastic restaurants offer a combination of French, Chinese, and, of course, local Vietnamese cuisine. We also sincerely hope that all participants from overseas and from Vietnam enjoy the technical discussions at the conference, build a strong friendship, and establish ties for future collaborations.

We send our sincere appreciations to the authors for their valuable contributions and the other participants of this conference. The conference would not have been possible without their support. Appreciates are also due to the many experts who contributed to making the event a success.

IC2020 Organizing Committees
FC Conference Group
Korean Institute of Information Technology
Korea Institute of Information Technology and Innovation
SIEC Korea Chapter

January 2020
Ho Chi Minh City, Vietnam

Organizing Committees

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Schedule

Day 1 January 14, 2020 (Tuesday)		
	Room1	Room3 (virtual)
14:00~15:30	Organizing Meeting	Session 1-1
15:30~17:00		Session 2-1
18:00~	Enjoy the beauty of Ho Chi Minh City	

Day 2 January 15, 2020 (Wednesday)			
	Room1	Room2	Room3 (virtual)
09:00~10:30	Session 3-1	Session 3-2	Session 3-3
10:30~	Coffee Break		
10:30~12:00	Session 4-1	Session 4-2	Session 4-3
12:00~13:00	Lunch		
13:00~14:00	Keynote Speech: Nigel Lin		
14:00~15:30	Session 5-1	Session 5-2	Session 5-3
15:30~16:00	Coffee Break		
17:00~18:00	Session 6-1	Session 6-2	Session 6-3
18:30~	Banquet		

Day 3 January 16, 2020 (Thursday)		
	Room1	Room2
14:00~15:30	Session 7-1	Session 7-2
15:30~17:00	Session 8-1	Session 8-2

Day 4 January 17, 2020 (Friday)	
13:30~16:00	Organizing Committee Meeting

Keynote Speaker

Dr. Nigel Lin
Auto-Chlor System
USA

A Journey of Building Extendable Network and Software Architectures for A Traditional Service Business

Abstract

For an enterprise to be successful and sustainable, there must be many effective processes and rules which support the operation of business. Auto-Chlor System is an 81-year traditional restaurant dishwasher services company with more than 950 employees, 62 branches among the United States, and 2 factory plants. As a franchisor, Auto-Chlor System also provides our supports to several nationwide dealers. As the business grows, the traditional manual processes and procedures require the help from technologies to automize them to keep up business growth. The IT hardware and infrastructure also require adequate solutions to prevent from the growth of the business being restricted by geographic separations among each business units.

During my years of service at Auto-Chlor System, we have successfully built the extensible network and software architectures to support the growth of the business. With unified network hardware and infrastructure, we are capable to support the dynamic requests from the field such as adding, acquiring, or moving a branch. We have simplified these used to be complex processes to easy plug and play solution. We can also provide promptly support to remote users without physically being at the location which greatly reduced the cost required for traveling and local IT staffing. We have also developed our software framework which is not only tailored to our business needs but also extensible to fulfil business requirements. We maintain static release schedule to constantly adding new features and changes based on feedbacks from our users. We also continuously research new solutions to integrate into our existing platform so we don't fall behind in technology.

I hope that through sharing our experience of practically applying technologies in our business. We can exchange thoughts and ideas on how other technologies can be utilized or applied to continuously create positive impacts to traditional businesses, such as Auto-Chlor System.

Biography

Nigel Lin is the Director of Information Services at Auto-Chlor System. He spent 9 years studying computer science and information engineering and received his Ph.D., Master, and Bachelor in Engineering from Tamkang University in Taiwan. After moving to the bay area in 2006, he worked for Microsoft for about a year before he joined Auto-Chlor System as a software engineer. After his success in handheld route accounting and acquisition projects, he moved up to the position of Director of Information Services in 2009. As an IT director, he leads both software and network teams to accomplish several major software and hardware projects, maintain network and system security, and continue researching the best solution which fits the company needs. He believes in the teach and learn philosophy; therefore, in 2016, he began his part time adjunct lecturer career at Santa Clara University. For more info about Nigel, you can visit his linked in profile at https://www.linkedin.com/in/nigel-lin-71574916.

Day 1
January 14, 2020

Session 1-1
Chair: Dr. Jason C. Hung

1. **Construction of New Cultural and Creative Intelligent Data Platform in Changbai Mountain**
   Zou Kejin

2. **Development Status and Trend of IoT Communication Technology**
   Liu Zhenhua

3. **License Plate Character Segmentation Algorithm in Intelligent IoT Visual Labe**
   Honglin Xie

4. **Brief Discussion on the Promotion of 5G to the Internet of Things**
   Zhenlong Yuan

5. **Impact of Internet of Things on Computer Communication Networks**
   Zhenhua Liu

6. **Characteristic of Network Attention for Rural Tourism Based on Big Data**
   Chunyan Wang, Qinglan Luo and Hyungho Kim

Session 2-1
Chair: Dr. Neil Y. Yen

1. **Calculus Teaching Method Based on Artificial Intelligence Application**
   Hesong Yang

2. **The Application of Artificial Intelligence Technology in Physical Education**
   Bo Wen

3. **Thoughts on the Relationship between Artificial Intelligence and Philosophy**
   Yu Dai

4. **Application of Disk Burning Technique on Human Centrifuge Data Manage**
   Yifeng Li, Baohui Li, Lihui Zhang, Xiaoyang Wei, Quan Wang, Zhao Jin and Jinghui Yang

5. **Application Analysis of Blockchain in the Field of Finance**
   Yangcheng Sun

6. **AI Finance and Blockchain Combine Medical Finance**
   Shifeng Wang

Day 2
January 15, 2020

Session 3-1
Chair: Dr. Yu-Wei Chan

1. **Global Citizenship Education: Conceptual Model for Community Knowledge Construction via Information and Communications Technology (ICT)—Big Data and Blockchain-based Application**
   Yoonil Auh and Hae-Gill Choi

2. **Design of an Academic Expert Search System on Spark**
   Do-Jin Choi, Hyeon-Byeong Lee, Kyoung-Soo Bok and Jae-Soo Yoo

5. **Optimization of Incomplete Body Using 3D Body Point Cloud GAN Model**
   Chang-gyun Kim, Se-kyoung Youm

6. **Life Pattern Derivation Using Big Data Analysis System and Anomaly Detection System Using Sequence Alignment Algorithm**
   Seunghyun Choi and Sekyoung Youm

7. **Research on Constructing a Crime Prevention System Using the Big Data Hadoop Model**
   Bong Soo Kim, Bong Jo Choo and Eun Joo Lee

8. **Indoor Localization Scheme based on Neural Network and Kriging Algorithm**
   Boney Labinghisa and Dong Myung Lee

Session 3-2
Chair: Dr. Hwa-Young Jeong

1. **A Study on Smart Device Privilege Elevation Attack Detection and Response**
   Youn-A Min and Jin-Mook Kim

2. **Design for an Intelligent CCTV application using deep learning**
   Joo Yeon Park and Chang Soo Sung

3. **A new approach to identify promising industries and technologies**
   Jinho Choi and Yong Sik Chang

4. **Big Data in Korean National Innovation Systems (KNIS): Evolution or Involution?**
   Eun Sun Kim, Kuk Jin Bae and Jeongeun Byun

5. **Deep Attention Matching Network with Turn-Level Recurrence for Multi-turn Response Selection**
   Junyoung Sohn, Hyuntae Park, Kwangil Kim and Gijoo Yang

6. **Amount of Network Traffic Prediction Protocol with IoT Environment**
   Gayoung Kim, Jingu Kang, Jinseop Jung and Ill Chul Doo

Session 3-3

1. **Construction of the University's Intelligent Teaching Model Based on Mobile Technology—Take the Reform of English Curriculum at Chengdu Neusoft College as an Example**
   Yuebi Li, Bi Zhao

2. **Intelligent Power Consumption Monitoring Device based on Single Chip Microcomputer**
   Li Keqiang

3. **Design and Implementation of Intelligent Garage Monitoring System**
   Junhua Li, Guobao Hao

4. **Capacity Building of Urban Community Mutual Volunteer Assistance for the Aged in Hangzhou Based on Intelligent Cities**
   Yangfeng Shao, Shengyong Zheng and Xueping Chen

5. **Intelligent Dispatching Platform Based on "Cargo Carpooling"**
   Chunqing Tian

6. **Design Strategy of Wearable Equipment Based on Smart Home Pension System**
   Ping Xia

Session 4-1

Chair: Dr. Nigel Lin

1. **Cross-domain Transformation for Cross-Spectral Face Recognition**
   Beom-Seok Oh and Sunjin Yu

2. **Real-Time Low-Cost Human Skeleton Detection**
   JinKyung Do, Eungyeol Song and Sunjin Yu

3. **Multi-User Diversity with Combined Chanel Hopping in IoT Environment**
   Kim Ga-young, Jeong Junho

4. **Analyzing user playstyle and approximating skill level in League of Legends through Video processing and statistical methods**
   Shinyoung Kim, Dohyeon Kim, HyungGeun Ahn and Byeongtae Ahn

5. **Recommendation Service using ANP for Airbnb**
   Hae-Jong Joo, Hwa-Young Jeong

6. **Big Data Traffic Reduction Method Using Edge Computing Technique in Complex Network Environment**
   Hae-jong Joo and Hwa-Young Jeong

Session 4-2

Chair: Dr. Byeongtae Ahn

1. **Image Classification Model Using Deep Learning on the Edge Device**
   Endah Kristiani, Chao-Tung Yang, Chin-Yin Huang, Yu-Wei Chan and Halim Fathoni

2. **Study on Battery Operation Mode changing in Islanded Microgrid**
   Park bum-yong, Lee hee-jin

3. **Research on Detection of Reinforcement Binding Spacing Based on Corner Detection Algorithm**
   Mingshou An and Dae-seong Kang

4. **Single Object Detection and Tracking from Videos Using Convolutional Neural Networks**
   Lee Dong-Hyun

5. **The Effective Use of Word Embeddings for Automatic Keyphrase Extraction and its Refinement**
   Deok Jin Seo, Yeonsoo Lim and Yuchul Jung

6. **Wire Removal and Recognition on Circuit Elements on Electronic Schematic**
   Sungyoung Kim,Si Jongwook and Kim Munnyeon.

Session 4-3

1. **A Review of the Development and Future Trends of Data Mining Tools**
   Guang Chen, RuiXin Chen, XiaoHui Wang, XinDa Li, Wei Liu, YuBing Kang and YuKun Son

2. **Weibo Public Opinion Monitoring System Based on Sensitive Information Mining**
   Yefan Liu, Keyan Cao

3. **Rural Retirement Destination Project Recommendation and Project Development Based on Big Data Analysis**
   Yue Wang, Haisen Lin

4. **Analysis of Diet Nutrition of Long Distance Runners Based on Big Data Monitoring**
   Zhang Dengfeng

5. **Design and Application of Automatic Report form Generation by OPC Data Collection Technology in Iron and Steel Enterprises**
   Qiaoshun Wu, Xiaoyun Zi, Kun Pi and Haibo Peng

6. **Stability Analysis of One Delay Gene Regulatory Networks**
   Ming Zheng, Mugui Zhuo

Session 5-1

1. **A Study on Order Logic of Logistics Appling Artificial Intelligence and Internet of Things**
   Gwan-Hyung Kim, Park Sang-Hyun, Kim Ho-Chul and Oh Am-suk

2. **A study for Drowsy Driving Detection and Prevention System**
   Seok-Woo Jang, Byeongtae Ahn

3. **A Study for Smart Contract Management System based on Block Chain**
   Byeongtae Ahn

4. **Knowledge sharing and new product development in pharmaceutical industry**
   Yoonkyo Cho

5. **Effect of customer value propositions on repurchase intention in the sharing economy**
   Woo-Sung Cho, Seung-Gyun Yoo

6. **A Strategy of Selecting Blocking Approaches Using Major Image Features**
   Byeongtae Ahn, Seok-Woo Jang

7. **A Real-time System to Predict Photovoltaic Power Generation of the Desired Time Section**
   Yongsu Kim, Sanghyun Lee and Howon Kim

Session 5-2

Chair: Dr. Hwa-Young Jeong

1. **Detection and Diagnosis of Polyp in Computed Tomographic Colonography Images**
   Xiaoyu Zhan, Jianqiang Li and Yan Pei

2. **The Implementation of Facial Symmetry Assessment before and after Orthognathic Surgery Using Transfer Learning**
   Chao-Tung Yang, Hsiu-Hsia Lin, Lun-Jou Lo, Yu-Wei Chan and Tianyi Zhang

3. **Software Architecture for High Trustworthy Cloud CDM**
   Yunhee Kang, Youngb. Park and Jaehyuk Cho

4. **Autonomous and Operational Services for Machine Vision-based Inspecting Colors of Multiple-wire Harnesses**
   Kyou Ho Lee and Seung Beom Hong

5. **Improving method for learning data imbalance in gender classification model using DA-FSL(Data Augmentation based Few-Shot Learning)**
   Jun Mock Lee, Hack Yoon Kim and Dae Seong Kang

6. **Implement of Image Classifier with Convolution Neural Network in FPGA**
   Chang-Yong Lee, Young-Hyung Kim and Yong-Hwan Lee

7. **Weighted Median Filter Architecture Based on the Sparse Window Approach**
   Jongkil Hyun, Younghyeon Kim, Junghwan Kim and Byungin Moon

Session 5-3

1. **Operation Strategy of Power System based on Energy Internet**
   Xi Chen, Wenjie Fu, Yong Li, Hang Lv, Xiaoliang Chai and Hui Wang

2. **Development Strategy of Rural Ecotourism Based on "Internet +"**
   Ning Hu

3. **Construction of School-enterprise Cooperation Training Platform for Preschool Education in the "Internet +" Era**
   Hui Gao, Lifeng Liu

4. **Public Service of Retired Personnel in Colleges and Universities in the Internet Era**
   Wang Yanping

5. **Traffic Planning Method of Smart City Based on Network Optimization**
   Yang Lu

6. **Design and Implementation of Urban Traffic Flow Resource Data Management System Based on Deep Learning Algorithm**
   JinLing Ye

Session 6-1

1. **A Study on Education Program Development for Promotion Creativity and Personality Based on Visual Contents and Digital Curation System**
   Youn Jeong-Jin, Jeong Su-Jeong, Lee Kang-Hoon and Kim Byung-Man

2. **Deep Learning-based Biometric Image Generation**
   Samuel Lee, Gye-Young Kim

3. **Blockchain-based Efficient Cloud Big Data Processing Technology**
   Yoon-Su Jeong, Byeong-Tae Ahn

4. **A Hybrid Saliency Model for Distant Target Detection**
   Kyung Joo Cheoi

5. **Automated Baby Monitoring System for Preventing Emergency Situations**
   Choi Soohyun, Yun Songho, Han Haein and Byeongtae Ahn

6. **Stretching Side Pose Classification using LSTM**
   Boldmaa Solongontuya, Kyung Joo Cheoi and Mi-hye Kim

Session 6-2

1. **Service Gateway between Interface Modules of Dehumidify Dryers and a Monitoring Server in a Plastic Smart Factory**
   Byung Mun Lee and Un Gu Kang

2. **A Study on the Development of Shared Service Quality Components of Face-to-face and Non-face-to-face Car Insurance Market in China**
   Youngsik Kwak, Kang-il Han, Ja-Kyung Koo, Yoon-jung Nam, Ji-young Pak and Jaewon Hong

3. **A Case Study on the Multipath Interference Phenomenon for Airport Facility**
   Kwang-sik Cho, Jong-il Moon and Yoon-sik Kwak

4. **A Study on the Multi-Component Analysis of Social Entrepreneurs to Improve Organizational Effectiveness**
   Son Jung-Hwan, Kim Mi-Hee and Kim Sung-Soo

5. **Isolation Enhancement for the Mobile Phone LTE/WiMAX/ and Dual WiFi-Band MIMO Antenna**
   Moon-hee Lee, Tae-ho Son, Yong-chang Lee and Sun-hyung Kim

6. **The False positive Decrement Research of Deep Learning based Rear Approaching Vehicle Detection for Agricultural Machine Driver Safety System**
   Yeunghak Yi, Jaechang Shim and Inwoo Lee

7. **Marketing Information Insertion Method Using Ultrasonic Signal and Unique Audio Content Information for Mobile Marketing Tools**
   Park, Kim, Ulugbek Ruziev, Seyoung Jang, Kyung-Sik Bang and Seok-Yoon Kim

8. **Fast R-CNN-based Network Intrusion Detection Model by Improving Dataset Class Imbalance**
   Dae Bum Lee and Juntae Kim

Session 6-3

1. **An Improved Algorithm of Mixed Cooperative Filter Recommendation Based on Project and User**
   Yongjun Luo, Hong Zheng

2. **Dynamic Community Recognition Algorithm Based on Node Embedding and Linear Clustering**
   Xiaoxian Zhang, Jianpei Zhang and Jing Yang

Day 3
January 16, 2020

Session 7-1

1. **Construction of Innovation and Entrepreneurship Curriculum System Based on New Media Technology**
   Liya Yao

2. **Hybrid Filtering Recommendation System for Libraries**
   Jie Dong, Gui Li

3. **Design of Laboratory Control and Management System Based on Cloud Service**
   Xinling Wang, Zhenjun Chen

4. **Numerical Control Machine Tool State Monitoring System Based on Multidimensional Information**
   Mei Tian, Yanhong Sun

5. **File Management Based on Decision System in Human Resource Optimization**
   Zhang Jinxiang

6. **Promotion Path of Children's Literary Works Reading in the New Media Age**
   Ding Mingxiu

Session 7-2

1. **Suspension System Based on PID Control**
   Huang Jian

2. **Fault Feature Extraction of Rotating Machinery by Using EMD and ICA**
   Fengli Wang, Yuchao Song

3. **Fault Feature Extraction of Diesel Engine by Using Ensemble EMD and Morphological Fractal Dimension**
   Fengli Wang, Yuchao Song

4. **Multi-Source Cooperative Dispatching Technology for the AC/DC Hybrid Grid**
   Qing Fang, Bing Qin, Siqi Guo, Jingyan Liu, Yushu Zhang, Fubo Cui, Zhensheng Wum, Junfeng Gui

5. **Control Method of Energy Saving and Loss Reduction of Power Grid**
   Xuliang Dong, Songxiao Xu, Manku Xu, Jingjing Ma, Moran Ma

6. **Control Method of Bionic Robot**
   Miao Shang, Jiale Zhang

Session 8-1

1. **Computer Simulation on the First Secretary of Poverty Alleviation**
   Fang Du, Zhuo Wang, Meldanjiang Rezik

2. **Contrasts of University Teachers' Development on Technology Skills between China and Australia**
   Yadong Ma

3. **On Visual Arts Education based of Network Information Technology**
   Yan Zhuang

4. **An Analysis of the Relationship between Career Decision-Making Self-efficacy and Career Selection Anxiety of Senior Students**
   Ye Jingbo

5. **Analysis of the Influence of Extracurricular Knowledge on College Students' Values Based on Knowledge Mapping Theory**
   Zhou Ying

6. **Application of Computer "Virtual Reality" Technology in College Physical Training**
   Liu Chunyuan

Session 8-2

1. **Intelligent Image Segmentation and Circular Rectangle Dichotomy Defogging Algorithm**
   Changxiu Dai

2. **Adaptive Gene Regulatory Network with Highly Calculated Genes**
   Ming Zheng, Mugui Zhuo

3. **Analysis of Knowledge Map Characteristics of College Students with Constructing Correct Values**
   Yu Wang

4. **Development of a New Type of Personnel Attendance Machine**
   Huang Jian

5. **Application of Computer Intelligent Control Technology in Physical Education Teaching**
   Xiaoming Su, Xin Zhou

6. **Network Security Performance Analysis Based on Netflow**
   Jie Xu, JinLing Ye, Wei Xu

Day 4
January 17, 2020

PM: Organizing Committee Meeting

Conference Venue

The 3rd International Conference on Innovative Computing (IC 2020) will be held at the **New World Saigon Hotel, Ho Chi Minh City, VIETNAM.**

Airports

- Tan Son Nhat International Airport **7.2 km**

Train stations

- Hoa Hung Train Station **2.3 km**

Contact

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