The 1st International Conference on Artificial Intelligence in Information and Communication





February 11 (Mon.) ~ 13 (Wed.), 2019, Okinawa, Japan



Final Program

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- Multi Screen Service Forum
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- Internet of Energy Research Center (Kookmin University)
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- Hybrid Device-Based Circadian ICT Research Center (Kookmin University)



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Il Young Chong Hankuk Univ. of Foreign Studies, Korea Jin-Ho Chung Ulsan National Institute of Science and Technology, Korea Yao-Liang Chung National Taiwan Ocean Univ., Taiwan Shuguang Cui Univ. of California, Davis, USA Jeounglak Ha ETRI, Korea Junbeom Hur Korea Univ., Korea	Sunwoong Choi	Kookmin Univ., Korea
Jin-Ho Chung Ulsan National Institute of Science and Technology, Korea Yao-Liang Chung National Taiwan Ocean Univ., Taiwan Shuguang Cui Univ. of California, Davis, USA Jeounglak Ha ETRI, Korea Junbeom Hur Korea Univ., Korea	Wan Choi	KAIST, Korea
Technology, Korea Yao-Liang Chung National Taiwan Ocean Univ., Taiwan Shuguang Cui Univ. of California, Davis, USA Jeounglak Ha ETRI, Korea Junbeom Hur Korea Univ., Korea	Il Young Chong	Hankuk Univ. of Foreign Studies, Korea
Shuguang Cui Univ. of California, Davis, USA Jeounglak Ha ETRI, Korea Junbeom Hur Korea Univ., Korea	Jin-Ho Chung	
Jeounglak Ha ETRI, Korea Junbeom Hur Korea Univ., Korea	Yao-Liang Chung	National Taiwan Ocean Univ., Taiwan
Junbeom Hur Korea Univ., Korea	Shuguang Cui	Univ. of California, Davis, USA
· ·	Jeounglak Ha	ETRI, Korea
Nguyen Huu Thanh Hanoi Univ. of Science and Technology, Vietnam	Junbeom Hur	Korea Univ., Korea
	Nguyen Huu Thanh	Hanoi Univ. of Science and Technology, Vietnam



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Insoo Hwang	Google Inc., USA
Keisuke Ishibashi	NTT, Japan
Jaehoon Jeong	Sungkyunkwan Univ., Korea
Changhee Joo	UNIST, Korea
Moonsoo Kang	Chosun Univ., Korea
Hongseok Kim	Sogang Univ., Korea
Jae-Hyun Kim	Ajou Univ., Korea
Ki-Hyung Kim	Ajou Univ., Korea
Suk Chan Kim	Pusan National Univ., Korea
Yun Hee Kim	Kyung Hee Univ., Korea
Young-Bae Ko	Ajou Univ., Korea
Youngwook Ko	Queen's Univ., Belfast, United Kingdom (Great Britain)
Katsushi Kobayashi	Univ. of Tokyo, Japan
Jerzy Konorski	Gdansk Univ. of Technology, Poland
Katarzyna Kosek-Szott	AGH Univ. of Science and Technology, Poland
Rami Langar	Univ., Paris Est Marne-la-Vallée, France
Jung Ryun Lee	Chung-Ang Univ., Korea
MinChul Lee	Kyutech Institute of Technology, Japan
Sungchang Lee	Hankuk Hangkong Univ., Korea
Hock Beng Lim	Nanyang Technological Univ., Singapore
Michiko Miyamoto	Akita Prefectural Univ., Japan
Osamu Mizuno	Kogakuin Univ., Japan
Hiroaki Morino	Shibaura Institute of Technology, Japan
Kazushi Muraoka	NEC Corporation, Japan
Hideya Ochiai	The Univ. of Tokyo, Japan
Kimio Oguchi	Seikei Univ., Japan
Ken Ohta	NTT DOCOMO INC., Japan
Seung Rhee	Kwangwoon Univ., Korea
Byonghyo Shim	Seoul National Univ., Korea
Kazuyuki Shudo	Tokyo Institute of Technology, Japan
Jaewoo So	Sogang Univ., Korea
Hong-Yeop Song	Yonsei Univ., Korea
Haiyan Tian	Kobe Univ., Japan
Naoki Wakamiya	Osaka Univ., Japan
Ryuji Wakikawa	Softbank Mobile, Japan
Sang-jo Yoo	Inha Univ., Korea
Tomoki Yoshihisa	Osaka Univ., Japan
Sejoon Lim	Kookmin Univ., Korea
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Jong Won Shin	GIST, Korea	
Jaegul Choo	Korea Univ., Korea	
Hyung-Sik Kim	Qraft Technologies, Korea	
Yeong Seon Kang	Univ. of Seoul, Korea	
Hyun-Tae Kim	Hyundai Elevator, Korea	
Byoungdu Kim	Victoria Univ. of Wellington, New Zealand	
Sung Won Han	Korea Univ., Korea	
Jong Kook Kim	Korea Univ., Korea	
Ho-Youl Jung	ETRI, Korea	
Sang-Woong Lee	Gachon Univ., Korea	
Sangwoo Kim	Yonsei Univ., Korea	
Hakjoo Oh	Korea Univ., Korea	
Lynn Choi	Korea Univ., Korea	
Chang Suk Lee	National Meteorological Satellite Center, Korea	
Younghoon Kim	Hanyang Univ., ERICA Campus, Korea	
Heung-II Suk	Korea Univ., Korea	
Sang Hyun Lee	Korea Univ., Korea	
Jiwon Seo	Hanyang Univ., Korea	
Yoonsuh Jung	Korea Univ., Korea	
Eun-Seok Ryu	Gachon Univ., Korea	
Sang Hyun Park	DGIST, Korea	
SungHwan Kim	Konkuk Univ., Korea	
Jong-June Jeon	Univ. of Seoul, Korea	
Hyejeong Ryu	Kangwon National Univ., Korea	
Jaeil Kim	Kyungpook National Univ., Korea	
Jongwuk Lee	Sungkyunkwan Univ., Korea	
Yongseok Yoo	Incheon National Univ., Korea	
Sanghuem Hwang	Seoul National Univ. of Science and Technology, Korea	
Jongwoo Lim	Hanyang Univ., Korea	
Eun-Seok Ryu	Gachon Univ., Korea	
Sun-Moo Kang	Kyung Hee Univ., Korea	
Seung Jun Baek	Korea Univ., Korea	
Lynn Choi	Korea Univ., Korea	
Yong-Jin Lee	Korea National Univ. of Education, Korea	
Young Jun Song	Kumoh National Institute of Technology, Korea	
Hye-Yeon Lim	Dong-A Univ., Korea	
Yoon-Ho Choi	Pusan National Univ., Korea	
Sun-Hee Kim	Sangmyung Univ., Korea	



Seungdo Jeong	Sangmyung Univ., Korea
Kyungchun Lee	Seoul National Univ. of Science and Technology, Korea
Jang-Hwan Choi	Ewha Womans Univ., Korea
Jaehak Chung	Inha Univ., Korea
Intae Hwang	Chonnam National Univ., Korea
Hyun-Ho Choi	Hankyong Univ., Korea
Ji-Eun Oh	KAIST, Korea
Sangik Han	KAIST, Korea
Su Min Kim	Korea Polytechnic Univ., Korea
Hyun Park	ETRI, Korea
Sang-Woon Jeon	Hanyang Univ., Korea
Keun Young Kim	ETRI, Korea
Hyun Ju Moon	Chungbuk National Univ., Korea
Shusuke Narieda	Mie Univ., Japan
Teppei Oyama	Fujitsu Laboratories, Japan
Keiichi Mizutani	Kyoto Univ., Japan
Khanh Tran Gia	Tokyo Institute of Technology, Japan
Kentaro Kobayashi	Nagoya Univ., Japan
Nobuhiko Miki	Kagawa Univ., Japan
Taichi Ohtsuji	NEC Corporation, Japan
Toshihiko Nishimura	Hokkaido Univ., Japan
Kentaro Ishizu	National Institute of Information and Communications Technology, Japan
Azril Haniz	Tokyo Institute of Technology, Japan



Message from Organizing Chairs

On behalf of the Organizing Committee, we would like to take this opportunity to express our excitement at hosting the 1st International Conference on Artificial Intelligence in Information and Communication (ICAIIC 2019) in Okinawa, Japan on Feb. 2019. ICAIIC 2019 is organized by the Korean Institute of Communications and Information Sciences (KICS) and technically co-sponsored by IEEE Communications Society (ComSoC) and IEICE Communications Society. The ICAIIC conference is pursuing a premier international forum to provide a great opportunity for exchanging the state-of-the-art research advances in artificial intelligence in information and communication and future technologies and expanding the research community.

We would like to welcome you to Okinawa! Okinawa is Japan's southernmost prefecture, consisting of a few dozen, small islands in the southern half of the Nansei Shoto, the island chain which stretches over about one thousand kilometers from Kyushu to Taiwan. Naha, Okinawa's capital, is located in the southern part of Okinawa Island. Okinawa Prefecture can be divided into three major island groups, the Okinawa Islands (Okinawa Shoto) around Okinawa Island (Okinawa Honto), the Miyako Islands (Miyako Retto) around Miyako Island and the Yaeyama Islands (Yaeyama Retto) around Ishigaki Island. Okinawa's climate is subtropical, with temperatures barely falling below 15 degrees in winter. The seas surrounding Okinawa's islands are considered among the world's most beautiful with coral reefs and abundant marine wildlife. Consequently, snorkeling and scuba diving are among Okinawa's top attractions. Tourist attractions include Okinawa Churaumi Aquarium, Century Beach, Pineapple Park, the Orion Beer Factory and Hiji Falls. In recent years, Okinawa has become an increasingly popular destination. Okinawa's population is among the longest living peoples in the world.

We have prepared an exciting program for you in ICAIIC 2019. We would like to express our sincere gratitude to all committee members and referees who made tremendous contributions to this event. In particular, our special thanks go to Technical Program Committee Chairs, Professors Sang-Chul Kim, Benaoumeur Senouci, Takaya Yamazato, and all TPC members for their great efforts in preparing the technical program. Special thanks are extended to all workshop organizers for preparing excellent workshops. We do hope that you will take this unique opportunity to attend the technical sessions, meet the authors, and foster greater collaboration with other researchers. The Organizing Committee put a lot of effort to make this conference greatly successful and enjoyable. In addition, if you have extra time, please do not miss the chance to take a look around Okinawa.

We look forward to seeing you in Okinawa! We also wish your active participation and support in the future event.



Yeong Min Jang Kookmin Univ., Korea



Takeo Fujii Univ. of Electro-Comms, Japan



Dong Seog Han

Kyungpook National Univ., Korea



Message from TPC Chairs

It is our great pleasure to welcome all of you to Okinawa, Japan, from Feb. 11 to 13, 2019, at the 1st International Conference on Artificial Intelligence in Information and Communication (ICAIIC). ICAIIC has addressed all aspects of artificial intelligence (AI), computing, networking, communications, and their convergence. This ICAIIC 2019 will be also a successful conference covering a wide range of topics on various AI technologies, and many forms of information and communication systems with AI.

This year we have received 278 paper submissions electronically from 24 countries in the world. Many of the papers were submitted from the Asia/Pacific region, and also the increasing number of submissions was made from Europe, USA, and Russia. A rigorous review process has followed in which all papers received three or more independent reviews. After the reviews and discussions, we have selected 121 technical papers for presentation at the conference. The accepted technical papers were organized into 21 technical sessions. The program is designed to provide a broad range of AI technologies, including deep neural networks, the availability of powerful computing platforms, big data and cloud, AI applications for networking and IoT, AI for data analysis, AI for eHealth, AI for image processing and multimedia, AI for control and decision systems, AI for neuroscience and neuroengineering, and other important technologies. Along with the contributions of prominent authors from around the world, we believe that this year's valuable and exciting program were made possible by the dedication of the technical program members.

We are indebted to all of the TPC members for their active participation and precious time. We would also like to thank our sponsors, KICS, IEEE Communications Society, and IEICE Communications Society for their kind support of this successful event. We extend our sincere thanks to the Organizing Committee Chairs, Prof. Yeong Min Jang, Prof. Takeo Fujii, and Prof. Dong Seog Han, for their continued support and guidance. We hope that all of you will enjoy the splendid program of ICAIIC 2019 as well as the beautiful scenery and charm of Okinawa. Sincerely,



Sang-Chul Kim Kookmin Univ., Korea



Benaoumeur Senouci ECE Paris, France



Takaya Yamazato Nagoya Univ., Japan



ICAIIC 2019 Program at A Glance

Room	Room A	Room B	Poster
		Feb. 11, 2019 (Monday)	
08:00~09:00		Registration	
09:00~10:40	1A: Information and Communications Technology 1	1B: AI Applications for Networking and IoT 1	
10:40~11:00		Coffee Break	
		Open and Plenary session	
	Opening	Prof. Yeong Min JANG (OC Chairs, Ko	ookmin University, Korea)
11:00~12:20	Welcome Address	Prof. Pascal LORENZ (Honorary Conf Alsace, France)	ference Chairs, University of Haute
	Keynote Speech	Al-based Wireless Communications Prof. Tomoaki OHTSUKI (Keio Univer	
12:20~13:30		Lunch Break	
13:30~15:10	2A: Information and Communications Technology 2	2B: AI Applications for Networking and IoT 2	
15:10~15:30		Coffee Break	
15:30~16:50	3A: AI Applications for Mobile Communication 1	3B: Al for Data Analysis, Big Data and Cloud 1	Poster 1
18:00~19:30		Welcome Reception	
Room			
Time	Room A	Room B	Poster
		Feb. 12, 2019 (Tuesday)	
09:00~10:40	4A: AI Applications for Mobile Communication 2	4B: Al for Data Analysis, Big Data and Cloud 2	Poster 2
10:40~11:00		Coffee Break	
11:00~12:20	5A: Al for eHealth 1	5B: AI for Image Processing and Multimedia 1	
12:20~13:30		Lunch Break	
13:30~15:10	6A: Al for eHealth 2	6B: AI for Image Processing and Multimedia 2	
15:10~15:20		Coffee Break	
15:20~16:40	7A: AI for Control and Decision Systems 1	7B: Al Foundation 1	
18:00~20:00			
Room	Room A	Room B	Poster
Feb. 13, 2019 (Wednesday)			
09:00~10:40	8A: Al for Energy, Computer Systems and Semiconductor Device	8B: Al for Neuroscience and Neuroengineering	Poster 3
10:40~12:00	9A: Al for Control and Decision Systems 2	9B: Al Foundation 2	1000



Keynote Speech

Keynote Speech: Al-based Wireless Communications

Speaker: Prof. Tomoaki OHTSUKI

Abstract

Recent advances in artificial intelligence (AI), including deep neural networks, the availability of powerful computing platforms, and big data, are providing us various applications that were impossible before. Al has been also expected in wireless communications where the systems have been complex and various kinds of new applications, such as autonomous vehicles and drones, and massive internet-of-things (IoTs). In this talk, we will provide a simple overview of AI for the perspective of wireless communications and share some interesting applications.



Biography

Prof. Tomoaki OHTSUKI received the B.E., M.E., and Ph. D. degrees in Electrical Engineering from Keio University, Yokohama, Japan in 1990, 1992, and 1994, respectively. From 1994 to 1995 he was a Post Doctoral Fellow and a Visiting Researcher in Electrical Engineering at Keio University. From 1993 to 1995 he was a Special Researcher of Fellowships of the Japan Society for the Promotion of Science for Japanese Junior Scientists. From 1995 to 2005 he

was with Science University of Tokyo. In 2005 he joined Keio University. He is now a Professor at Keio University. From 1998 to 1999 he was with the department of electrical engineering and computer sciences, University of California, Berkeley. He is engaged in research on wireless communications, optical communications, signal processing, and information theory. Dr. Ohtsuki is a recipient of the 1997 Inoue Research Award for Young Scientist, the 1997 Hiroshi Ando Memorial Young Engineering Award, Ericsson Young Scientist Award 2000, 2002 Funai Information and Science Award for Young Scientist, IEEE the 1st Asia-Pacific Young Researcher Award 2001, the 5th International Communication Foundation (ICF) Research Award, 2011 IEEE SPCE Outstanding Service Award, the 27th TELECOM System Technology Award, ETRI Journal's 2012 Best Reviewer Award, and 9th International Conference on Communications and Networking in China 2014 (CHINACOM '14) Best Paper Award. He has published more than 170 journal papers and 380 international conference papers. He served a Chair of IEEE Communications Society, Signal Processing for Communications and Electronics Technical Committee. He served a technical editor of the IEEE Wireless Communications Magazine and an editor of Elsevier Physical Communications. He is now serving an Area Editor of the IEEE Transactions on Vehicular Technology and an editor of the IEEE Communications Surveys and Tutorials. He has served generalco chair and symposium co-chair of many conferences, including IEEE GLOBECOM 2008, SPC, IEEE ICC 2011, CTS, IEEE GCOM 2012, SPC, and IEEE SPAWC. He gave tutorials and keynote speech at many international conferences including IEEE VTC, IEEE PIMRC, and so on. He was a Vice President of Communications Society of the IEICE and is the President-Elect of Communications Society of the IEICE. He is a senior member of the IEEE and a fellow of the IEICE.



Feb 11, 2019 (Monday)

1A: Information and Communications Technology 1

Chair: Junhee Seok (Korea University, Korea)

 $[09:00 \sim 10:40]$

- 1A-1 A Survey of Blockchain and Its Applications

 Qalab E Abbas (Kumoh National University of Technology, South Korea, Korea); Sung-Bong Jang
 (Kumoh Natinoal Institute of Technology, Korea)
- 1A-2 Opportunities of Optical Spectrum for Future Wireless Communications

 Mostafa Zaman Chowdhury, Moh. Khalid Hasan, Md. Shahjalal and Yeong Min Jang (Kookmin University, Korea)
- 1A-3 Informational Linguistics: Computer, Internet, Artificial Intelligence and Language Aliaksandr Barkovich (Minsk State Linguistic University, Belarus)
- 1A-4 Reproducing Musicality: Detecting Musical Objects and Emulating Musicality Through Partial Evolution Aran Samson (Ateneo de Manila University, Philippines)
- 1A-5 Stock Prices Prediction using the Title of Newspaper Articles with Korean Natural Language Processing HyungBin Yun, Ghudae Sim and Junhee Seok (Korea University, Korea)

1B: Al Applications for Networking and IoT 1

Chair: Hasbi Nur Prasetyo Wisudawan (Universitas Gadjah Mada, Indonesia)

 $[09:00 \sim 10:40]$

- 1B-1 Achievable Throughput of Multiband Wireless LAN using Simultaneous Transmission over Multiple Primary Channels Assisted by Idle Length Prediction Based on PNN Kazuto Yano (ATR, Japan); Naoto Egashira (ATR Wave Engineering Laboratories, Japan); Julian L Webber (Osaka University & Advanced Telecommunications Research Institute International, Japan); Makoto Usui and Yoshinori Suzuki (ATR, Japan)
- 1B-2 Automatic Multi-Thread Code Generation for Monitoring Signature-based Control Flow Daejin Park (Kyungpook National University (KNU), Korea); Jeonghun Cho, Kiho Choi and Hyeongrae Kim (Kyungpook National University, Korea)
- 1B-3 Deep Q-Network Based Rotary Inverted Pendulum System and Its Monitoring on the EdgeX Platform Ju-Bong Kim, Hyun-Kyo Lim and Do-Hyung Kwon (Korea University of Technology and Education, Korea); Min-Suk Kim and Yong-Geun Hong (ETRI, Korea); Youn-Hee Han (Korea University of Technology and Education, Korea)
- 1B-4 Improved MalGAN: Avoiding Malware Detector by Leaning Cleanware Features

 Masataka Kawai, Kaoru Ota and Mianxiong Dong (Muroran Institute of Technology, Japan)
- 1B-5 Packet-based Network Traffic Classification Using Deep Learning
 Hyun-Kyo Lim, Ju-Bong Kim and Joo-Seong Heo (Korea University of Technology and Education,
 Korea); Kwihoon Kim and Yong-Geun Hong (ETRI, Korea); Youn-Hee Han (Korea University of
 Technology and Education, Korea)



Feb 11, 2019 (Monday)

2A: Information and Communications Technology 2

Chair: Kevin Kam Fung Yuen (Singapore University of Social Sciences, Singapore)

[13:30 ~ 15:10]

- 2A-1 A Résumé Evaluation System Based on Text Mining
 Yi-Chi Chou, Chun-Yen Chao and Han-Yen Yu (Institute for Information Industry, Taiwan)
- 2A-2 Efficient Communication Overhead Reduction using Polygonal Approximation-based ECG Signal Compression

 Daejin Park (Kyungpook National University (KNU), Korea); SeungMin Lee (Kyungpook National University, Korea); Kil-Houm Park (Kyungpook National University. Daegu, Korea, Korea); Yoosoo Jeong and Junho Kwak (Kyungpook National University, Korea)
- 2A-3 Harmful Wildlife Detection System Utilizing Deep Learning for Radio Wave Sensing on Multiple Frequency Bands

 Ryota Ogami (Ritsumeikan University, Japan)
- 2A-4 Towards a Cybersecurity Investment Assessment using Primitive Cognitive Network Process Kevin Kam Fung Yuen (Singapore University of Social Sciences, Singapore)

2B: AI Applications for Networking and IoT 2

Chair: Yu-Huei Cheng (Chaoyang University of Technology, Taiwan)

[13:30 ~ 15:10]

- 2B-1 A Combined PDR and Wi-Fi Trilateration Algorithm for Indoor Localization

 Alwin Poulose and Dong Seog Han (Kyungpook National University, Korea); Odongo Steven Eyobu

 (Kyungpook National University & Makerere University, Korea)
- 2B-2 A Development Architecture for the Intelligent Animal Care and Management System Based on the Internet of Things and Artificial Intelligence
 Yu-Huei Cheng (Chaoyang University of Technology, Taiwan)
- 2B-3 Compacting Deep Neural Networks for Light Weight IoT Based Applications with Node Pruning Ashiquzzaman Akm, Linh Van Ma, Sang Woo Kim and Dongsu Lee (Chonnam National University, Korea); Tai-Won Um (Chosun University, Korea); Jinsul Kim (Chonnam National University, Korea)
- 2B-4 Vehicle/Pedestrian Localization System Using Multiple Radio Beacons and Machine Learning for Smart Parking

 Takuro Ebuchi (Ritsumeikan University, Japan)



Feb 11, 2019 (Monday)

3A: AI Applications for Mobile Communication 1

Chair: Syed Shahid (University of Ulsan, Korea)

 $[15:30 \sim 16:50]$

- 3A-1 A New Unsupervised Short-Utterance based Speaker Identification Approach with Parametric t-SNE Dimensionality Reduction
 Omar Elnaggar (University of Nottingham, Malaysia); Roselina Arelhi (University of Nottingham Malaysia, Malaysia)
- 3A-2 Artificial Intelligence in Future Evolution of Mobile Communication

 Janne Peisa (Ericsson Research, Finland); Erik Dahlman and Stefan Parkvall (Ericsson Research, Sweden); Hugo M Tullberg (Ericsson, Sweden); Hideshi Murai and Masanobu Fujioka (Ericsson Japan, Japan)
- 3A-3 Challenges and Limitations in Automating the Design of MAC Protocols Using Machine-Learning Hannaneh Barahouei pasandi and Tamer Nadeem (Virginia Commonwealth University, USA)
- 3A-4 Compressive Wideband Frequency Spectrum Sensing Based On MUSIC

 Hasbi Nur Prasetyo Wisudawan and Dyonisius Dony Ariananda (Universitas Gadjah Mada,
 Indonesia); Risanuri Hidayat (Gadjah Mada University (UGM), Indonesia)

3B: Al for Data Analysis, Big Data and Cloud 1

Chair: Michiko Miyamoto (Akita Prefectural University, Japan)

 $[15:30 \sim 16:50]$

- 3B-1 Analysis of Vocal Disorders using Cobweb Clustering
 Yunyoung Nam and Keonsoo Lee (Soonchunhyang University, Korea); Chanki Moon (Soonchunhyang University, Korea)
- 3B-2 Comparative study of supervised learning algorithms for student performance prediction Mehdi Mohammadi (Kabul University, Afghanistan); Mursal Dawodi (University of The Ryukyus, Japan); Nadira Ahmadi (Kabul University, Afghanistan)
- 3B-3 Evaluation of Machine-Made Scores for Music Games Generated by a Deep Neural Network Atsuhito Udo and Naofumi Aoki (Hokkaido University, Japan)
- 3B-4 Statistics Shared CAF Diversity Combining Based Sensing Using Weight Computation Technique Shusuke Narieda (Mie University, Japan); Daiki Cho and Kenta Umebayashi (Tokyo University of Agriculture and Technology, Japan); Hiroshi Naruse (Mie University, Japan)



Technical Sessions Feb 12, 2019 (Tuesday)

4A: Al Applications for Mobile Communication 2

Chair: Abduladhim Ashtaiwi (American University of the Middle East, Kuwait)

[09:00 ~ 10:40]

- 4A-1 Dynamic Bandwidth Allocation Scheme for Wireless Networks with Energy Harvesting Using Actor-Critic Deep Reinforcement Learning Quang Vinh Do and Insoo Koo (University of Ulsan, Korea)
- 4A-2 People Crowd Density Estimation System using Deep Learning for Radio Wave Sensing of Cellular Communication Kyosuke Shibata (Ritsumeikan University, Japan)
- 4A-3 Simulation on Delay of Several Random Access Schemes Hoesang Choi and Hichan Moon (Hanyang University, Korea)
- Victim Detection System Using Autonomous UAV Flight and Data Analysis based on Multiple 4A-4 Beacon Radio Sensing Seiji Andong (Ritsumeikan University, Japan)

4B: AI for Data Analysis, Big Data and Cloud 2

Chair: Miao Yu (Southeast University, P.R. China)

 $[09:00 \sim 10:40]$

- 4B-1 A Complete Multi-CPU/FPGA-based Design and Prototyping Methodology for Autonomous Vehicles: Multiple Objects Detection and Recognition Case Study Quentin Cabanes (ECE-Paris, France); Ben Senouci (ECE Paris, France); Amar Ramdane-Cherif (Université de Versailles St.-Quentin en Yvelines & LISV Laboratory, France)
- 4B-2 A Novel Case-Based Reasoning Method for Cognitive Frequency Allocation Yun Deok Won, Jae Hoon Park, Joo Pyoung Choi and Won Cheol Lee (Soongsil University, Korea)
- 4B-3 Automatic Detection of Hate Speech on Facebook Using Sentiment and Emotion Analysis Axel E. Rodriguez (NTUST, Taiwan); Carlos Argueta (Soul Hackers Labs, Taiwan); Yi-Ling Chen (National Taiwan University of Science and Technology, Taiwan)
- 4B-4 Selection of Core Words from Textual Patent Data with DEA based on Citation Shigeaki Onoda and Koji Okuhara (Toyama Prefectural University, Japan)



Feb 12, 2019 (Tuesday)

5A: Al for eHealth 1

Chair: Kahlil Muchtar (Syiah Kuala University, Indonesia)

 $[11:00 \sim 12:20]$

- 5A-1 3D Nanoscale Tracking Data Analysis for Intracellular Organelle Movement using Machine Learning Approach
 Seohyun Lee and Hyuno Kim (The University of Tokyo, Japan); Masatoshi Ishikawa (University of Tokyo, Japan); Hideo Higuchi (The University of Tokyo, Japan)
- 5A-2 Design of Wavelet Digital Filter for Edge Detection of Medical MRI image
 Woon Cho, Daewon Chung, Joonhyeon Jeon and Gyungmin Hwang (Dongguk University, Korea)
- 5A-3 Side-Channel Resistance Evaluation Method using Statistical Tests for Physical Unclonable Function *Yusuke Nozaki and Masaya Yoshikawa (Meijo University, Japan)*
- 5A-4 Smart Navigation with Al Engine for Li-Fi based Medical Indoor Environment Ho Yu and Jeong Gon Kim (Korea Polytechnic University, Korea)
- 5A-5 Spectrum Database Construction based on HMM and Spectrum Sharing in Multiple Primary Users Environment

 Yuya Aoki and Takeo Fujii (The University of Electro-Communications, Japan)

5B: Al for Image Processing and Multimedia 1

Chair: Mursal Dawodi (University of The Ryukyus, Japan)

 $[11:00 \sim 12:20]$

- 5B-1 Soft Decision-based Data Detection Scheme for NR Communications System

 Sangmi Moon, Soonho Kwon, Hyeonsung Kim, Byeonggyu Song and Intae Hwang (Chonnam National University, Korea)
- 5B-2 Fuzzy-Neural-Network Based Audio-Visual Fusion for Speech Recognition Gin-Der Wu and Hao-Shu Tsai (National Chi Nan University, Taiwan)
- 5B-3 Guidewire Tip Tracking using U-Net with Shape and Motion Constraints Sang Hyun Park (DGIST, Korea)
- 5B-4 Hand Pose Detection in HMD Environments by Sensor Fusion using Multi-layer Perceptron *Luc Vu (University of Science and Technology (UST), South Korea, Korea); Bum-Jae You (Korea Institute of Science and Technology, Korea)*



Feb 12, 2019 (Tuesday)

6A: Al for eHealth 2

Chair: Sang Hyun Park (DGIST, Korea)

 $[13:30 \sim 15:10]$

- 6A-1 A Classroom Atmosphere Management System for Analyzing Human Behaviors in Class Activities Yu Te Ku, Han-Yen Yu and Yi-Chi Chou (Institute for Information Industry, Taiwan)
- 6A-2 Free-Head Appearance-Based Eye Gaze Estimation on Mobile Devices

 Jigang Liu, Bu Sung Lee and Deepu Rajan (Nanyang Technological University, Singapore)
- 6A-3 Fused Convolutional Neural Network for White Blood Cell Image Classification Ki-Doo Kim, Rappy Saha and Partha Pratim Banik (Kookmin University, Korea)
- 6A-4 Human-Object Contour for Action Recognition with Attentional Multi-modal Fusion Network Miao Yu, Weizhe Zhang, Qingxiang Zeng, Chao Wang and Jie Li (Southeast University, P.R. China)
- 6A-5 Skin Lesion Primary Morphology Classification With End-To-End Deep Learning Network

 Tatyana Polevaya (ITMO University, Russia); Roman Ravodin (North-Western State Medical University named after I. I. Mechnikov, Russia); Andrey A. Filchenkov (ITMO University, Russia)

6B: Al for Image Processing and Multimedia 2

Chair: Seohyun Lee (The University of Tokyo, Japan)

[13:30 ~ 15:10]

- 6B-1 A Deep Learning Facial Expression Recognition based Scoring System for Restaurants

 Wan-Jung Chang (Southern Taiwan University of Science and Technology, Taiwan); Miriam Schmelzer

 and Florian Kopp (University of Applied Sciences Constance (HTWG), Germany); Chia-Hao Hsu,

 Jian-Ping Su, Liang-Bi Chen and Ming-Che Chen (Southern Taiwan University of Science and

 Technology, Taiwan)
- 6B-2 Comparison of Performance by Activation Functions on Deep Image Prior S Fujii and Hitoshi Hayashi (Sophia University, Japan)
- 6B-3 Image Recommendation for Automatic Report Generation using Semantic Similarity Changhun Hyun and Hyeyoung Park (Kyungpook National University, Korea)
- 6B-4 Patch-wise weakly supervised learning for object localization in video

 Dong Huh, Dong Huh, Taekyung Kim and Jaeil Kim (Kyungpook National University, Korea)
- Vehicle Path Prediction based on Radar and Vision Sensor Fusion for Safe Lane Changing

 Jihun Kim (Kyungpook National University, Korea); Žiga Emeršič (University of Ljubljana &

 Faculty of Computer and Information Science, Slovenia); Dong Seog Han (Kyungpook National

 University, Korea)



Feb 12, 2019 (Tuesday)

7A: Al for Control and Decision Systems 1

Chair: Eduardo Colangelo (Fraunhofer Institute for Manufacturing Engineering and Automation IPA, Germany)

[15:20 ~ 16:40]

- 7A-1 A Research on Pedestrian Detection Using CNN-based GAP and Hippocampal Structure Su-Bin Park (Dong-A University, Korea); Dae-Seong Kang (University of Dong-A, Korea); Hye-Youn Lim (Dong-A Univ, Korea)
- 7A-2 Deep Learning Application in Power System with a Case Study on Solar Irradiation Forecasting Aslam Muhammad (Myongji University, Electrical Engineering, Yongin South Korea, Korea); Jae Lee (Myongji University, Computer Engineering, Yongin South Korea, Korea); Sugwon Hong (Myongji University, Korea); Seung Lee (Myongji University, Electrical Engineering, Yongin South Korea, Korea); Eui Lee (Myongji University, Yongin South Korea, Korea)
- 7A-3 Intelligent Road Crashes Avoidance System
 Abduladhim Ashtaiwi (American University of the Middle East, Kuwait)
- 7A-4 Investigation of Context-aware System Using Activity Recognition
 Yuki Watanabe and Reiji Suzumura (Tokyo Denki University, Japan); Shogo Matsuno (Toyohashi
 University of Technology, Japan); Minoru Ohyama (Tokyo Denki University, Japan)
- 7A-5 Short-Term Solar PV Forecasting Using Gated Recurrent Unit with a Cascade Model Nattawat Sodsong, Wen Ouyang and Kun-Ming V. Yu (Chung Hua University, Taiwan)

7B: Al Foundation 1

Chair: Axel E. Rodriguez (NTUST, Taiwan)

[15:20 ~ 16:40]

- 7B-1 A Study on Facial Expression and First Impression Through Machine Learning WonChan Lee (Ajou University, Korea)
- 7B-2 A unified smart surveillance system incorporating adaptive foreground extraction and deep learning-based classification

 Kahlil Muchtar (Nodeflux, Indonesia and Syiah Kuala University, Indonesia), Faris Rahman (Nodeflux, Indonesia), Muhammad Rizky Munggaran (Nodeflux, Indonesia), Alvin Prayuda Juniarta Dwiyantoro (Nodeflux, Indonesia), Richard Dharmadi (Nodeflux, Indonesia), Indra Nugraha (Nodeflux, Indonesia)
- 7B-3 Adaptive Natural Gradient Method for Learning Neural Networks with Large Data set in Mini-Batch Mode Hyeyoung Park (Kyungpook National University, Korea); Kwanyong Lee (Korea National Open University, Korea)
- 7B-4 IT-Business Alignments among Different Divisions of Japanese Corporations Michiko Miyamoto (Akita Prefectural University, Japan)
- 7B-5 Outlier Geometric Angle Detection Algorithm *Zhongyang Shen (China Mobile, P.R. China)*



Technical Sessions Feb 13, 2019 (Wednesday)

8A: Al for Energy, Computer Systems and Semiconductor Device

Chair: Seokjoo Shin (Chosun University, Korea)

 $[09:00 \sim 10:40]$

- 8A-1 Blockchain based smart energy trading platform using smart contract Pee Seung Jae, Kang Eung Seon and Song Jae Geun (Sogang University, Korea); Ju Wook Jang (Sogan university, Korea)
- 8A-2 Data Fusion Analysis with Optimal Weight in Smart Grid Zhu Dengjun (State Grid Xuchang Electric Power Supply Company, P.R. China); Yuan Haiwei (Xuchang Water Conservancy Planning and Design Institute, P.R. China); Yan Jinlong (Fudan University & Shanghai Institute of Intelligent Electronics and Systems, P.R. China); Qing Yanping and Yang Weijie (State Grid Xuchang Electric Power Supply Company, P.R. China)
- 8A-3 DCS-PCA based Data Transmission in Smart Grid Zhu Deng jun (State Grid Xuchang Electric Power Supply Company, P.R. China); Yan Jinlong (Fudan University & Shanghai Institute of Intelligent Electronics and Systems, P.R. China); Yuan Haiwei (Xuchang Water Conservancy Planning and Design Institute, P.R. China); Ma Yong jun and Hu Xu feng (State Grid Xuchang Electric Power Supply Company, P.R. China)
- 8A-4 Parallel Hybrid Particle Swarm Optimization for Integration Framework of Optimal Operational Planning Problem of an Energy Plant and Production Scheduling Problem Shuhei Kawaguchi and Yoshikazu Fukuyama (Meiji University, Japan)
- 8A-5 Swarm Reinforcement Learning for Operational Planning of Energy Plants for Small and Mid-Sized **Building Energy Management Systems** Mayuko Sato and Yoshikazu Fukuyama (Meiji University, Japan)

8B: Al for Neuroscience and Neuroengineering

Chair: Dong Seog Han (Kyungpook National University, Korea)

 $[09:00 \sim 10:40]$

- 8B-1 Deep learning based decomposition of brain networks Pilsub Lee, Myungwon Choi and Daegyeom Kim (Korea University, Korea); Suji Lee (Korea University Graduate School, Korea); Hyun-Ghang Jeong (Korea University Guro Hospital, Korea); Cheol E Han (Korea University, Korea)
- 8B-2 Estimation of Control Parameters in Neuromuscular Skeletal Systems Combined with CNNs and Parametric Identification Makoto Kikuchi (National Institute of Technology, Ibaraki College, Japan)
- 8B-3 Periodontal Disease Detection Using Convolutional Neural Networks Jaehan Joo, Suk Chan Kim, Sinjin Jeong, Heetae Jin, UHhyeon Lee and JY Yoon (Pusan National University, Korea)
- 8B-4 Reliability assessment on human activity recognition Alberto Fornaser and Mariolino De Cecco (University of Trento, Italy); Teruhiro Mizumoto and Keiichi Yasumoto (Nara Institute of Science and Technology, Japan)



Technical Sessions Feb 13, 2019 (Wednesday)

9A: Al for Control and Decision Systems 2

Chair: Songpu Ai (University of Stavanger, Norway)

 $[11:00 \sim 12:20]$

- 9A-1 Cyclostationary based full-duplex spectrum sensing using adversarial training for convolutional neural networks Hang Liu (The University of Electro-Communications, Japan); Xu Zhu (Toshiba Corporation, Japan); Takeo Fujii (The University of Electro-Communications, Japan)
- 9A-2 Evolutionary Ensemble LSTM based Household Peak Demand Prediction Songpu Ai, Antorweep Chakravorty and Chunming Rong (University of Stavanger, Norway)
- 9A-3 IoT Security Issues and Light Weight Block Cipher Hyungsik Shin, Ho-Kyoung Lee, Ho-Young Cha, Hyungtak Kim and Seo Weon Heo (Hongik University, Korea)
- 9A-4 Influence of the Gratuitous Grants on the Upstream Grants in the Energy Efficient TDM-PONs Alaelddin Fuad Yousif Mohammed (Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea, Korea)

9B: Al Foundation 2

Chair: Tosin Adesuyi (Kumoh National Institute of Technology, Korea)

 $[11:00 \sim 12:20]$

- 9B-1 A layer-wise Perturbation based Privacy Preserving Deep Neural Networks Tosin Adesuyi (Kumoh National Institute of Technology, Gumi, South, Korea); Byeong Man Kim (Kumoh National Institute of Technology, Korea)
- 9B-2 Chinese-Story-Generation-with-FastText-Transformer-Network Lin Wei and Gao Yu (National Chung Cheng University, Taiwan)
- 9B-3 Priority Adversarial Example in Evasion Attack on Multiple Deep Neural Networks Hyun Kwon and Hyunsoo Yoon (KAIST, Korea); Daeseon Choi (Kongju University, Korea)
- Tracking User Application Activity by using Machine Learning Techniques on Network Traffic 9B-4 Sina Fathi Kazerooni, Yagiz Kaymak and Roberto Rojas-Cessa (New Jersey Institute of Technology, USA)



Feb 11, 2019 (Monday): Poster 1

Poster Sessions

Chair: N	am Tuan Le (Kookmin University, Korea)	[15:30 ~ 16:50]
P1-1	1D CNN Based Human Respiration Pattern Recognition using Ultra Wideband Ra Seong-Hoon Kim (Gachon University, Korea); Gi-Tae Han (University of Gachon	
P1-2	Performance Enhancement of Deep Neural Network Using Feature Selection an Intrusion Detection Juho Woo, Joo Yeop Song and Young-June Choi (Ajou University, Korea)	nd Preprocessing for
P1-3	Human Activity Recognition and Prediction Based on Wi-Fi Channel State Information Learning Sang-Chul Kim (Kookmin University, Korea); Sung Hyun Kim (AMDS, U.S. Air Fi Gi Kim (Kookmin University, Korea)	
P1-4	Classification of Food Powders with Open Set using Portable VIS-NIR Spectrome Hanjong You, Dong-Kyun Joo, Jeongung Kim, Hyungjik Kim, Seung Min Lee (Kookmin University, Korea)	
P1-5	Comparative Analysis of Machine Learning Algorithms along with Classifiers for AF D Yunyoung Nam and Keonsoo Lee (Soonchunhyang University, Korea); Chanki McUniversity, Korea)	
P1-6	Convolutional Neural Network Approach for Aircraft Noise Detection Juwon Pak (University of Ajou, Korea)	
P1-7	Cyclic Parameter Sharing for Privacy-Preserving Distributed Deep Learning Platf Joohyung Jeon, Dohyun Kim and Joongheon Kim (Chung-Ang University, Korea)	
P1-8	DecMac: A Deep Context Model for High Efficiency Arithmetic Coding Qian Liu (Shanghai Jiao Tong University, P.R. China); Yiling Xu (Shanghai Jiao China); Zhu Li (University of Missouri, Kansas City, USA)	otong University, P.R.
P1-9	Deep Learning Algorithm using Virtual Environment Data for Self-driving Car Juntae Kim, Geun Young Lim, Youngi Kim, Bokyeong Kim and Changseok Bae (Daeje	on University, Korea)
P1-10	Deep Learning Based Pedestrian Trajectory Prediction Considering Location Relationship In kyu Choi (Korea Electronics Technology Institute, Korea)	between Pedestrians
P1-11	Hardness on Style Transfer Deep Learning for Rococo Painting Masterpieces Kyeong Seon Kim, Dohyun Kim and Joongheon Kim (Chung-Ang University, Kon	ea)
P1-12	Improving Learning time in Unsupervised Image-to-Image Translation TaeHong Min, Do-yun Kim and Young-June Choi (Ajou University, Korea)	
P1-13	Interference Mitigation for Multicast D2D Communications Underlay Cellular Ne Devarani Devi Ningombam, Chung Ghiu Lee and Seokjoo Shin (Chosun University	
P1-14	Pedestrian Detection and Distance Estimation Using Thermal Camera in Night T JongBae Kim (Seoul Digital University, Korea)	ime



Poster Sessions

Feb 12 2019 (Tuesday): Poster 2

Chair: N	Nostafa Zaman Chowdhury (Kookmin University, Korea)	[09:00 ~ 10:40]
P2-1	A Machine-Learning-Based Channel Assignment Algorithm for IoT Jing Ma and Tokoya Nagatsuma (Tokyo University of Science, Japan); Song-Ju Kin Japan); Mikio Hasegawa (Tokyo University of Science, Japan)	ı (Keio University,
P2-2	A Two-Stage Spatial Spectrum Sensing Scheme Based on Angle of Arrival Estimatic Zih-Siang Lin, Hsien-Sen Hung and Hoang-Yang Lu (National Taiwan Ocean University)	
P2-3	Adversarial training for low-complexity convolutional neural networks using in specific training for low-complexity convolutional neural networks using in specific training (The University of Electro-Communications, Japan)	
P2-4	Deep learning based 3D defect detection system using photometric stereo illumin JongHyuk Lee and Min Young Kim (Kyunpook National University, Korea)	ation
P2-5	Deep Learning for Polar Codes over Flat Fading Channels Ade Irawan (Universitas Pertamina, Indonesia); Gunawan Witjaksono (Universiti Tekn Malaysia); Wahyu Kunto Wibowo (Universitas Pertamina, Indonesia)	ologi PETRONAS,
P2-6	Future Optical Camera Communication Based Applications and Opportunities for Md. Shahjalal, Moh. Khalid Hasan, Mostafa Zaman Chowdhury and Yeong Mi University, Korea)	•
P2-7	Machine Learning-Based Beamforming in Two-User MISO Interference Channels Hyung Jun Kwon and Jung Hoon Lee (Hankuk University of Foreign Studies, Korea); Wan G	Choi (KAIST, Korea)
P2-8	Multi-Channel Audio Source Separation Using Azimuth-Frequency Analysis at Neural Network Jung Min Moon, Jun Ho Kim and Tae Woo Kim (Gwangju Institute of Science and Te Chan-Jun Chun (Korea Institute of Civil Engineering and Building Technology(KIC Kook Kim (Gwangju Institute of Science and Technology (GIST), Korea)	echnology, Korea);
P2-9	The Modified Artificial Bee Colony-Based SLM Scheme for PAPR Reduction in OFDI HaoYue Jiang and Hsin-Ying Liang (Chaoyang University of Technology, Taiwan)	VI Systems
P2-10	The Properties of mode prediction using mean root error for regularization Ghudae Sim, Hyungbin Yun and Junhee Seok (Korea University, Korea)	
P2-11	SAOR-Based Precoding with Enhanced BER Performance for Massive MIMO System Yanjun Hu, Jiayu Wu and Yi Wang (Anhui University, P.R. China)	ns
P2-12	Simultaneous Traffic Sign Recognition and Real-Time Communication using Dual Moh. Khalid Hasan, Md. Shahjalal, Mostafa Zaman Chowdhury and Yeong Milliniversity Korea)	



Poster Sessions

- P2-13 Solution for Sampling Time Deviation in Decoding Rol-Signaling Waveform Using S2-PSK Hoan Nguyen, Minh Duc Thieu, Huy Nguyen and Yeong Min Jang (Kookmin University, Korea)
- P2-14 The Impact of Camera Parameters on Optical Camera Communication

 Huy Nguyen, Minh Duc Thieu, Hoan Nguyen and Yeong Min Jang (Kookmin University, Korea)

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Feb 13, 2019	(vveunesua	y): Poster <i>s</i>

Chair: Sang-Chul Kim (Kookmin University, Korea)

 $[09:00 \sim 10:40]$

- P3-1 A Denoising Autoencoder based wireless channel transfer function estimator for OFDM communication system

 Tom Wada and Takao Toma (University of the Ryukyus, Japan); Mursal Dawodi (University of The Ryukyus, Japan); Jawid Baktash (University of the Ryukyus, Japan)
- P3-2 A Bayes Classifier Considering Environmental Change for Multivariate Signal Data *Itaru Aso and Koji Okuhara (Toyama Prefectural University, Japan)*
- P3-3 A Service-Oriented Approach for the Cognitive Factory A Position Paper Eduardo Colangelo (Fraunhofer Institute for Manufacturing Engineering and Automation IPA & University of Stuttgart, Germany); Silke Hartleif (Fraunhofer Institute for Manufacturing Engineering and Automation IPA, Germany); Torsten Kröger (Karlsruhe Institute of Technology, Germany); Thomas Bauernhansl (Fraunhofer Institute for Manufacturing Engineering and Automation IPA, Germany)
- P3-4 Adaptive Magnetic Resonance Wireless Power Transfer System with Optimum frequency and Power-Leve Tracking for maintaining highly efficient Namyoon Kim (Daeduk University, Korea)
- P3-5 CNN Training for Face Photo based Gender and Age Group Prediction with Camera Kyoung Son Jhang and Junsoo Cho (Chungnam National University, Korea)
- P3-6 Comparison and Analysis of DNS and DOA for Internet of Things Naming System Pyung Soo Kim (Korea Polytechnic University, Korea)
- P3-7 Effective Feature-Based Automatic Modulation Classification Method Using DNN Algorithm
 Sang Hoon Lee and Kwang-Yul Kim (Soongsil University, Korea); Jae-Hyun Kim (Ajou University,
 Korea); Yoan Shin (Soongsil University, Korea)
- P3-8 Feature Image-Based Automatic Modulation Classification Method Using CNN Algorithm

 Jungho Lee (Soong Sil University, Korea); Kwang-Yul Kim and Yoan Shin (Soongsil University, Korea)
- P3-9 Fire Detection Using Video Images and Temporal Variations

 Gwangsu Kim (Korea Advanced Institute of Science and Technology, Korea); SungHwan Kim (Konkuk University, Korea); Junyeong Kim (Korea Advanced Institute of Science and Technology, Korea)
- P3-10 Neural Network-based Classification for Engine Load
 Syed Shahid and BaekDu Jo (University of Ulsan, Korea); Sunghoon Ko (Hyundai Heavy Industries,
 Korea); Sungoh Kwon (University of Ulsan, Korea)



Poster Sessions

- P3-11 Object Management Based on Metadata Registry for Intelligent Mobile Augmented Reality Sung-Bong Jang (Kumoh Natinoal Institute of Technology, Korea)
- P3-12 Optimal User Pairing for Achieving Rate Fairness in Downlink NOMA Networks

 Van-Phuc Bui (Soongsil University, Korea); Phu Nguyen (Soongsil University & Ho Chi Minh niversity of Technology, Korea); Hieu V. Nguyen, Van-Dinh Nguyen and Oh-Soon Shin (Soongsil University, Korea)
- P3-13 Predictive Models of Fire via Deep learning Exploiting Colorific Variation *Jiseong Han (Konkuk University, Korea); Gwangsu Kim (Korea Advanced Institute of Science and Technology, Korea); Chanseo Lee (Keimyung University, Korea); Hwang Ung (Hanyang University, Korea); Yeongkwang Han (Deep Visions, Korea); SungHwan Kim (Konkuk University, Korea)*
- P3-14 Framework of Big data Analysis about IoT-Homedevice for supporting a decision making an effective strategy about new product design

 Jong-jin Jung (KETI), KyungWon Kim (KETI), and JongBin Park (KETI)



Venue

Pacific Hotel Okinawa

ICAIIC Conference Date: Feb 11 (Mon.) ~ Feb 13 (Wed.), 2019

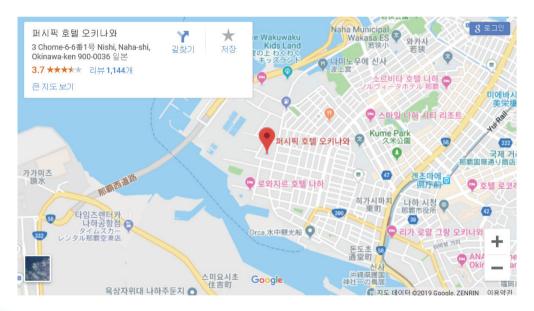
Venue Website: https://pacifichotel.jp/english/

Location: Okinawa, Japan

Hotel information:

Pacific Hotel Okinawa is located at west side, sea side of Haha City. Pacific Hotel Okinawa is approximately 8 minutes from Naha Airport by car and 5 minutes from the down town Kokusai Street by car. The hotel is located at very convenient place. There are many attractive facilities in our hotel. There is the bar where guests enjoy piano and jazz live performance. They have large parking lot.

Address: 3-6-1Nishi Naha city Okinawa prefecture Japan



Contact Information

Phone: (+81)98-868-5162 Fax: (+81)98-868-8876

Travel Information

1.T GALLERIA OKINAWA

This is the only downtown duty free shop in Japan, and over 130 brands are available here. It features a huge parking lot, and it is convenient that it is adjacent to the Yui Rail Omoromachi station. Purchased tax-free items will be received at the airport before boarding instead of the shop, so anybody can use this system without worrying about baggage while sightseeing.



2. SHURIJO CASTLE PARK

The sightseeing spot, which represents Okinawa, was designated as world heritage in 2000 and is the landmark that symbolizes the prosperity of Ryukyu Dynasty. It is about 5 hectare of land. However, only a part of the park is open for public. Visitors need to follow a series of arrows, and it takes about 1 hour to 1 hour & 30 minutes to take a tour. If you want to take more time to see, take a free tour guide with you. The tour guide will show you paid-zones.



3. ENJOY RYUKUCOSPLAY AT THE WORLD HERITAGE SHURICASTLE.

Wearing the traditional costume from the era of Kingdom of the Ryukuschanges the frame of mind. Visitors can try on traditional costumes, take photos, and participate in a tour of the ShurijoCastle Park. The ladies will get a full professional hair styling and make-up. It takes about an hour to get fixed up in the costume. At first, it may be a little awkward to walk



among other tourists in a costume, but after a while, you may feel like you are one of the royal family from the old Kingdom of the Ryukus. Having a stroll in the facility lets you imagine the lives of people back in time. "Experienceof RyukuCostume by Mode Mariage" is a comprehensive activity with a luxurious costume, hair styling, and make-up done by producers of court-style weddings, and a guided tour with a history specialist. At the ZakimiCastle Ruins (also a World Heritage Site), there are tourist plans including picture taking in a Ryukucostume. Why not be the King or Queen for a day?

4. MAKISHI PUBLIC MARKET

Various types of ingredients including fresh fish, meat, daily food and dry food are available at this market which is powerful and filled with excitement.

Senior experienced staffs are so energetic. A system called "mochiage (lift-up)" is





popular for tourists. This is the system that you purchase fresh fish on the 1F of the market and ask for a staff of a restaurant to cook the purchased fish, which will be served on the 2F (500 yen each for cooking).

Don't miss it if you want to try the local fresh seafood.



Travel Information

5. HEIWA STREET & TSUBOYA YACHIMUN STREET

Heiwa Street is an arcade starts from in front of Okinawa Mitsukoshi, and souvenirs and folk crafts for young people are available here.

After passing the arcade, you will be on Tsuboya. It is the district that potters from each area gathered for orders by Ryukyuan Government. Along the well-maintained Tsuboya Yachimun Street, various types of yachimun (pottery) are lined up at old and new shops.

Enjoy a relaxed atmosphere while feeling the history!





6. KOKUSAI STREET

When it comes to shopping in Naha City, Kokusai Street might come to mind. It is always filled with many tourists, and souvenir shops and restaurants are located. If you want to go to find fancy or unique stuff, take a back street. Traditional and modern mixed folk craft shop, fancy cafe and stand-like coffee shop are all located on New Paradise Street behind Matsuo bus stop. You can see the different view than Kokusai Street.



7. ZIZAKE YOKOCHO

This is an izakaya on Kokusai Street to enjoy Okinawan cuisine, local sake Awamori, and listening to the traditional folk song performance. A performance by band members including singers takes the stage for 3 times a day, and requests from guests are also welcomed. Lyrics of folk songs that represent Okinawa are displayed on tables, so you can take a look at them. You might get up and start dancing with guests and staff when you get excited!



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