

# **2020 International Conference on Artificial Intelligence in Information and Communication (ICAIIC 2020)**

**Fukuoka, Japan  
19 – 21 February 2020**



**IEEE Catalog Number: CFP20BAD-POD  
ISBN: 978-1-7281-4986-8**

**Copyright © 2020 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP20BAD-POD
ISBN (Print-On-Demand):	978-1-7281-4986-8
ISBN (Online):	978-1-7281-4985-1

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## Oral Sessions

### 1A: Information and Communications Technology 1 / Feb. 19, 2020 (Wednesday)

Session Chair: Prof. Mai Ohta (Fukuoka University, Japan)

[09:00 ~ 10:40]

- 1A-1 Prediction of Network Throughput using ARIMA.....1  
*Dongwon Lee, Dongwoo Lee, Minji Choi and Joohyun Lee (Hanyang University, Korea (South))*
- 1A-2 Resource Optimization in Satellite-Based Internet of Things.....6  
*Feng Li and Kwok-Yan Lam (Nanyang Technological University, Singapore)*
- 1A-3 Surrounding Vehicle Distance Estimation using Impulse Radio Ultra-Wideband.....12  
*Jihun Kim and Dong Seog Han (Kyungpook National University, Korea (South))*
- 1A-4 Optimal Resources Allocation of Bidirectional Relay Communication.....16  
*Caixia Cai, Runhe Qiu and Xueqin Jiang (Donghua University, China)*

### 1B: AI for Image Processing and Multimedia 1 / Feb. 19, 2020 (Wednesday)

Session Chair: Prof. Benaoumeur Senouci (ECE-Paris, France)

[09:00 ~ 10:40]

- 1B-1 Analysis of the Effect of Automotive Ethernet Camera Image Quality on Object Detection Models.....21  
*Hsiang Huang (National Taipei University, Taiwan); Po-Yi Li (National Taipei University's, Taiwan); Kuan-Chung Chen and Yang-Yuan Chen (National Taipei University, Taiwan)*
- 1B-2 Food Image Recognition Based on Densely Connected Convolutional Neural Networks.....27  
*Al-Selwi Metwalli (Zhejiang Sci-Tech University, China); Wei Shen (Zhejiang Sci-Tech University & University of Memphis, China); Chase Q. Wu (New Jersey Institute of Technology & Oak Ridge National Laboratory, USA)*
- 1B-3 Multivariate Time Series Imaging for Short-Term Precipitation Forecasting Using Convolutional Neural Networks.....33  
*Elmer C Peramo (Advanced Science and Technology Institute, Philippines); Sun Arthur A. Ojeda (University of the Philippines Manila, Philippines); Geoffrey Solano (University of the Philippines, Manila & University of the Philippines, Diliman, Philippines)*
- 1B-4 Generative Adversarial Networks Based on Edge Computing With Blockchain Architecture for Security System.....39  
*Kevin Putra Dirgantoro, Jae Min Lee and Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))*
- 1B-5 Optimization Algorithm for Driver Monitoring System using Deep Learning Approach.....43  
*Min Woo Yoo and Dong Seog Han (Kyungpook National University, Korea (South))*

## Oral Sessions

### 2A: Information and Communications Technology 2 / Feb. 19, 2020 (Wednesday)

Session Chair: Prof. Dong Seog Han (Kyungpook National University, Korea (South))

[14:00 ~ 15:40]

- 2A-1      Communication Handover for Multi-Dimensional UAVs in ROI using MIMO-Ultrawideband.....47  
*Williams-Paul Nwadiugwu, Jae Min Lee and Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))*
- 2A-2      Radio Environment Map Construction with Joint Space-Frequency Interpolation.....51  
*Koya Sato (Tokyo University of Science, Japan); Kei Inage (Tokyo Metropolitan College of Industrial Technology, Japan); Takeo Fujii (The University of Electro-Communications, Japan)*
- 2A-3      Controlling the Communication Overhead of Source Location Privacy Protocols in Multi-hop Communication Wireless Networks.....55  
*Lilian Mutalemwa, Moonsoo Kang and Seokjoo Shin (Chosun University, Korea (South))*
- 2A-4      Transmission Timing Adjustment Algorithm in IoT System Equipped with Low-cost Oscillator with Low Frequency Stability.....60  
*Masaki Amano, Mai Ohta and Makoto Taromaru (Fukuoka University, Japan)*
- 2A-5      Measurement-based Spectrum Database for Wireless Distributed Networks Using Shadowing Classifier.....64  
*Keita Katagiri (The University of Electro-Communication & Advanced Wireless and Communication Research Center (AWCC), Japan); Takeo Fujii (The University of Electro-Communications, Japan)*

### 2B: AI for Image Processing and Multimedia 2 / Feb. 19, 2020 (Wednesday)

Session Chair: Min Young Kim (Kyungpook National University, Korea (South))

[14:00 ~ 15:40]

- 2B-1      Tooth Detection and Segmentation with Mask R-CNN.....70  
*Guohua Zhu, Zewen Piao and Suk Chan Kim (Pusan National University, Korea (South))*
- 2B-2      Personal Identification Methods Using Footsteps of One Step.....73  
*Yuki Hori and Takahiro Ando (Kyushu University, Japan)*
- 2B-3      Development of an Inaudible Sound Communications System Based on a Machine Learning Approach.....79  
*Naofumi Aoki (Hokkaido University, Japan)*
- 2B-4      Deep Learning Approach to Face Pose Estimation for High-Speed Camera Network System.....84  
*Seohyun Lee and Hyuno Kim (The University of Tokyo, Japan); Masatoshi Ishikawa (University of Tokyo, Japan)*
- 2B-5      Using CNN to identify map spots based on high-resolution data.....89  
*Xin Zhang (Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China); lu Hua Luo (Lanzhou Jiaotong University, China)*

## Oral Sessions

### 3A: Information and Communications Technology 3 / Feb. 19, 2020 (Wednesday)

Session Chair: Prof. Sungtek Kahng (University of Incheon, Korea (South))

[16:00 ~ 17:40]

- 3A-1 High-Speed Optimizaition Method for Resoruce Allocation in Wireless Communication Systems by Coherent Ising Machine.....93  
*Hirotake Ito and Yuchang Jiang (Tokyo University of Science, Japan); Hiroyuki Yasuda (The University of Tokyo, Japan); Kazuyuki Aihara (University of Tokyo, Japan); Mikio Hasegawa (Tokyo University of Science, Japan)*
- 3A-2 Cognitive Intelligence with Adaptive MAC Vehicular Ad-Hoc Network Optimization.....98  
*Joanne Mun Yee Lim (School of Engineering, Monash University Malaysia); Yoong Choon Chang (Universiti Tunku Abdul Rahman, Malaysia); Dhaval Karshanbhai Patel (School of Engineering and Applied Science-Ahmedabad University, India)*
- 3A-3 Rolling MIMO-OFDM for Optical Camera Communication System.....103  
*Huy Nguyen, Tung Lam Pham, Hoan Nguyen, Van Hoa Nguyen and Yeong Min Jang (Kookmin University, Korea (South))*
- 3A-4 A Nature-Inspired Machine Optimization Technique for Metasurfaces to Improve the Isolation between 5G MIMO Antennas.....107  
*Changhyeong Lee, Abdul Rehman, Heejun Park and Gwang-Gyun Namgung (Incheon National University, Korea (South)); Yejune Seo (Inchoen National University, Korea (South)); Sungtek Kahng (University of Incheon, Korea (South))*
- 3A-5 Automatic wireless power transfer management based on receiver feedback.....109  
*Md. Faisal Ahmed and Md. Morshed Alam (Kookmin University, Korea (South)); Mostafa Zaman Chowdhury (Khulna University of Engineering and Technology, Bangladesh); Yeong Min Jang (Kookmin University, Korea (South))*
- 3A-6 Adaptation Plan Policy in Traffic Routing for Priority Vehicle.....113  
*Krishna Priawan Hardinda (University of Electro-Communications, Japan); Yuichi Sei (The University of Electro-Communications, Japan); Yasuyuki Tahara (UEC, Japan); Akihiko Ohsuga (The University of Electro-Communications, Japan)*

### 3B: AI for Image Processing and Multimedia 3 / Feb. 19, 2020 (Wednesday)

Session Chair: Dr. Mitchel Perez (Vrije Universiteit Brussel, Belgium)

[16:00 ~ 17:40]

- 3B-1 Compact Deeplearning Convolutional Neural Network based Hand Gesture Classifier Application for Smart Mobile Edge Computing.....119  
*Ashiqzaman Akm, Seungmin Oh and Dongsu Lee (Chonnam National University, Korea (South)); Ji Lee (Masters Student, SMMC Lab, Chonnam National University, Korea (South)); Jinsul Kim (Chonnam National University, Korea (South))*

## Oral Sessions

- 3B-2      Three-Dimensional Photon Counting Integral Imaging Reconstruction using Merging Reconstruction Method.....124  
*Jaehoon Lee (Kyushu Institute of Technology, Japan); Myungjin Cho and Kotaro Inoue (Hankyong National University, Korea (South)); Min-Chul Lee (Kyushu Institute of Technology, Japan)*
- 3B-3      Semantic Video Segmentation with Dense-and-Dual Warping Spatial Features.....129  
*Mehwish Awan and Jitae Shin (Sungkyunkwan University, Korea (South))*
- 3B-4      Object Detection Framework for High Mobility Vehicles Tracking in Night-Time.....133  
*Tung Lam Pham, Hoan Nguyen, Van Bui, Huy Nguyen, Van Hoa Nguyen and Yeong Min Jang (Kookmin University, Korea (South))*
- 3B-5      A generalized sub-pixel mapping algorithm for auto-stereoscopic displays using slanted optical plates.....136  
*Hyun-Woo Kim (Kyushu Institute of Technology, Japan); Myungjin Cho (Hankyong National University, Korea (South)); Min-Koo Kang (Korea Institute of Science and Technology, Korea (South)); Sung-Kyu Kim (Korea Institute of Science and Technology (KIST), Korea (South)); Min-Chul Lee (Kyushu Institute of Technology, Japan)*
- 3B-6      Image Quality Enhancement With Machine Learning Based Multi-Step Super-Resolution.....141  
*Niai Yano and Hiroshi Watanabe (Waseda University, Japan)*

### 4A: AI Applications for Networking and IoT 1 / Feb. 20, 2020 (Thursday)

Session Chair: Prof. Chase Q. Wu (New Jersey Institute of Technology & Oak Ridge National Laboratory, USA)

[09:00 ~ 10:40]

- 4A-1      Q-Transfer: A Novel Framework for Efficient Deep Transfer Learning in Networking.....146  
*Trung V. Phan (Technische Universität Chemnitz, Germany); Shabnam Sultana (Technical University of Chemnitz, Germany); Tri Gia Nguyen (Duy Tan University, Vietnam); Thomas Bauschert (Chemnitz University of Technology, Germany)*
- 4A-2      A Deep Autoencoder Approach to Received Signal Strength-Based Localization with Uncertain Parameters.....152  
*Chaehun Im (University of Yonsei, Korea (South)); Sunghoon Jung and Chungyong Lee (Yonsei University, Korea (South))*
- 4A-3      Down-clocking Scheme using Deep Learning for Minimizing Energy Consumption in Wireless Networks.....155  
*JaeHyeon Park, Seung-Hyun Jeong and Young-Joo Suh (Pohang University of Science and Technology (POSTECH), Korea (South))*
- 4A-4      Performance Evaluation of Machine Learning Based Channel Selection Algorithm Implemented on IoT Sensor Devices and Its Application to Wireless Sensor Network for Building Monitoring System.....161  
*So Hasegawa, Ryoma Kitagawa, Takumi Ito and Takashi Nakajima (Tokyo University of Science, Japan); Song-Ju Kim (Keio University, Japan); Yozo Shoji (National Institute of Information and Communications Technology, Japan); Mikio Hasegawa (Tokyo University of Science, Japan)*
- 4A-5      SICNN: Spatial Interpolation with Convolutional Neural Networks for Radio Environment Mapping.....167  
*Riku Hashimoto and Katsuya Suto (The University of Electro-Communications, Japan)*

## Oral Sessions

### 4B: AI for Control and Decision Systems 1 / Feb. 20, 2020 (Thursday)

Session Chair: Dr. Hirotsada Honda (Toyo University, Japan)

[09:00 ~ 10:40]

- 4B-1 Estimation of Probability Density Function Using Multi-bandwidth Kernel Density Estimation for Throughput.....171  
*Norisato Suga (ATR & Tokyo University of Science, Japan); Kazuto Yano (ATR, Japan); Julian L Webber (Osaka University & Advanced Telecommunications Research Institute International, Japan); Yafei Hou (Okayama University, Japan); Toshihide Higashimori and Yoshinori Suzuki (ATR, Japan)*
- 4B-2 Utilization of Postural Transitions in Sensor-based Human Activity Recognition.....177  
*Nguyen Thi Hoai Thu (Kyungpook National University, Korea); Dong Seog Han (Kyungpook National University, Korea (South))*
- 4B-3 Waveform-based End-to-end Deep Convolutional Neural Network with Multi-scale Sliding Windows for Weakly Labeled Sound Event Detection.....182  
*Seokjin Lee and Minhan Kim (Kyungpook National University, Korea (South))*
- 4B-4 A Bilingual Chatbot Using Support Vector Classifier On an Automatic Corpus Engine Dataset.....187  
*Jasper Kyle Catapang (University of the Philippines Manila, Philippines); Geoffrey Solano (University of the Philippines, Manila & University of the Philippines, Diliman, Philippines); Nathaniel Oco (De La Salle University, Philippines)*
- 4B-5 PPMC Training Algorithm: A Deep Learning Based Path Planner and Motion Controller.....193  
*Tamir Blum and William Jones (Tohoku University, Japan); Kazuya Yoshida (Space Robotics Laboratory, Tohoku University, Japan)*

### 5A: AI Applications for Networking and IoT 2 / Feb. 20, 2020 (Thursday)

Session Chair: Prof. Takeo Fujii (The University of Electro-Communications, Japan)

[11:00 ~ 12:40]

- 5A-1 AI based Location Tracking in WiFi Indoor Positioning Application.....199  
*Jeong Gon Kim (Korea Polytechnic University, Korea (South))*
- 5A-2 Computational Offloading of Convolutional Neural Network on a Smart Watch.....203  
*Imran A. Zualkerman and Mohammed Towheed (American University of Sharjah, United Arab Emirates)*
- 5A-3 UAV-assisted Real-time Data Processing using Deep Q-Network for Industrial Internet of Things.....208  
*Riesa Krisna Astuti Sakir, Muhammad Rusyadi Ramli, Jae Min Lee and Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))*
- 5A-4 Receiver Beacon Transmission Interval Design Using Q-Learning focused on Packet Delivery Rate for Multi-Stage Wireless Sensor Networks.....212  
*Yu-ki Hatada and Takeo Fujii (The University of Electro-Communications, Japan)*
- 5A-5 1D CNN based network intrusion detection with normalization on imbalanced data.....218  
*Wooseong Kim and Meliboev Azizjon (Gachon University, Korea (South)); Alikhanov Jumabek (Inha University, Korea (South))*

## Oral Sessions

### 5B: AI for Control and Decision Systems 2 / Feb. 20, 2020 (Thursday)

Session Chair: Dr. Patrick Philipp (Karlsruhe Institute of Technology (KIT), Germany)

[11:00 ~ 12:40]

- 5B-1 Predictive Analysis of Business Processes Using Neural Networks with Attention Mechanism.....225  
*Patrick Philipp (Karlsruhe Institute of Technology (KIT), Germany); Ruben Jacob (Karlsruhe Institute of Technology KIT, Germany); Sebastian Robert (Fraunhofer IOSB, Germany); Jürgen Beyerer (Karlsruhe Institute of Technology (KIT), Germany); Jürgen Beyerer (Fraunhofer IOSB, Germany)*
- 5B-2 Precision Analysis of Bresenham's Algorithm on Low-power Intelligent Seeding System.....231  
*Rahimi Zahari, Tiong Hoo Lim and Serina Lim Chee Lian (Universiti Teknologi Brunei, Brunei Darussalam)*
- 5B-3 Reservoir computing with inertial manifold.....237  
*Hirotsada Honda (Toyo University, Japan)*
- 5B-4 Building Activity Profiling: Explainable and Predictive Modeling for Building Automation.....242  
*Takashi Kasuya (the University of Tokyo & Takenaka Corporation, Japan); Hiroshi Esaki (The University of Tokyo, Japan); Takeshi Takai (Takenaka Corporation, Japan)*
- 5B-5 Traffic Congestion Level Prediction Based on Recurrent Neural Networks.....248  
*Fei-Rong Huang, Cong-Siang Wang and Chih-Min Chao (National Taiwan Ocean University, Taiwan)*

### 6A: AI Applications for Mobile Communication 1 / Feb. 20, 2020 (Thursday)

Session Chair: Prof. Fumiaki Maehara (Waseda University, Japan)

[14:00 ~ 15:40]

- 6A-1 Deep Learning Based CoMP Transmission Method Using Vehicle Position Information for Taxi Radio Systems.....253  
*Kazuki Kojima, Yukiko Shimbo, Hirofumi Saganuma and Fumiaki Maehara (Waseda University, Japan)*
- 6A-2 Power Control Based on Multi-Agent Deep Q Network for D2D Communication.....257  
*Shi Gengtian (Waseda, Japan); Jiang Liu (Waseda University, Japan)*
- 6A-3 Spectrum Database Aided Prior Vacant Frequency Band Detection for Spectrum Sharing.....262  
*Miho Musashi and Koichi Adachi (The University of Electro-Communications, Japan)*
- 6A-4 Fast Beamforming Strategy: Learning the AoD of the Dominant Path.....267  
*YongMin Song and Jeongwan Kang (Hanyang University, Korea (South)); Hyekyung Jwa and Jeehyeon Na (ETRI, Korea (South)); Sunwoo Kim (Hanyang University, Korea (South))*
- 6A-5 A Localization Method with Insufficient RSS samples using Neural Network.....272  
*Sunghoon Jung (Yonsei University, Korea (South)); Chaehun Im (University of Yonsei, Korea (South)); Chaehyeon Eom and Chungyong Lee (Yonsei University, Korea (South))*



## Oral Sessions

### 6B: AI for Data Analysis, Big Data and Cloud 1 / Feb. 20, 2020 (Thursday)

Session Chair: Dr. Rabiul Islam (Tokyo University of Agriculture and Technology, Japan)

[14:00 ~ 15:40]

- 6B-1 Neural architecture search under black-box objectives with deep reinforcement learning and increasingly-sparse rewards.....276  
*Mitchel A. Perez, Abel Diaz Berenguer and Ercheng Pei (Vrije Universiteit Brussel, Belgium); Meshia Cédric Oveneke (VUB, Belgium); Hichem Sahli (Vrije Universiteit Brussel, Belgium)*
- 6B-2 Measures of Complexity for Large Scale Image Datasets.....282  
*Ameet Rahane (University of California, Berkeley, USA); Anbumani Subramanian (Intel Corporation, USA)*
- 6B-3 Deep Hybrid Fuzzy Neural Hammerstein-Wiener Network for Stock Price Prediction.....288  
*Chen Xie, Deepu Rajan and Chai Quek (Nanyang Technological University, Singapore)*
- 6B-4 A Robust Method for Kernel Principal Component Analysis.....294  
*Duo Wang and Toshihisa Tanaka (Tokyo University of Agriculture and Technology, Japan)*
- 6B-5 Aspect Extraction for Tourist Spot Review in Indonesian Language using BERT.....298  
*Muhamad Rizky Yanuar and Shun Shiramatsu (Nagoya Institute of Technology, Japan)*

### 7A: AI Applications for Mobile Communication 2 / Feb. 20, 2020 (Thursday)

Session Chair: Prof. Dong Myung Lee (Tongmyong University, Korea (South))

[16:00 ~17:40]

- 7A-1 The Role of Deep Learning in NOMA for 5G and Beyond Communications.....303  
*Moh. Khalid Hasan, Md. Shahjalal, Md Mainul Islam, Md. Morshed Alam, Md. Faisal Ahmed and Yeong Min Jang (Kookmin University, Korea (South))*
- 7A-2 Learning to Communicate with Autoencoders: Rethinking Wireless Systems with Deep Learning.....308  
*Manuel Eugenio Morocho-Cayamcela, Judith Nkechinyere Njoku and Wansu Lim (Kumoh National Institute of Technology, Korea (South))*
- 7A-3 Deep Learning Based Fingerprinting Scheme for Wireless Positioning.....312  
*Keun Young Seok and Jung Hoon Lee (Hankuk University of Foreign Studies, Korea (South))*
- 7A-4 Location Estimation in Indoor Environments Using Multiple Items of Sensed Information.....315  
*Eisuke Kudoh and Kosuke Karino (Tohoku Institute of Technology, Japan)*
- 7A-5 Face Verification Using mmWave Radar Sensor.....320  
*Eran Hof, Amichai Sanderovich and Evyatar Hemo (Qualcomm Israel, Israel)*
- 7A-6 Gesture recognition with 60GHz 802.11 waveforms.....325  
*Eran Hof, Amichai Sanderovich and Evyatar Hemo (Qualcomm Israel, Israel)*

## Oral Sessions

### 7B: AI for Data Analysis, Big Data and Cloud 2 / Feb. 20, 2020 (Thursday)

Session Chair: Prof. Hiroaki Mukaidani (Hiroshima University, Japan)

[16:00 ~17:40]

- 7B-1 Who wins the Game of Thrones? How Sentiments improve the Prediction of Candidate Choice.....330  
*Chaehan So (Yonsei University, Korea (South))*
- 7B-2 Effective-target Representation via LSTM with Attention for Aspect-level Sentiment Analysis.....336  
*Quan Liu and Hiroaki Mukaidani (Hiroshima University, Japan)*
- 7B-3 Attention Based R&CNN Medical Question Answering System in Chinese.....341  
*Huey-Ing Liu (Fu-Jen Catholic University, Taiwan); Wei Lin Chen (Fu Jen Catholic University, Taiwan); Chih-Chien Ni (Fu Jen University, Taiwan); ChengHung Hsu (Fu Jen Catholic University, Taiwan); Weiming Chen (Congregation for Catholic Education, Taiwan); Yan-Ting Liu (Fu Jen University, Taiwan)*
- 7B-4 Visualization Techniques for Outlier Data.....346  
*Choi Seoung-Ho, Oh Young-Kyo and Dongyoung Koo (Hansung University, Korea (South))*
- 7B-5 Leveraging Bayesian Deep Learning for Spaceborne GNSS-R Retrieval on Global Soil Moisture.....352  
*Aung Lwin (School of Electronic and Information Engineering & Beihang University, China); Dongkai Yang and Hong Xuebao (Beihang University, China)*

### 8A: AI for Neuroscience and eHealth 1 / Feb. 21, 2020 (Friday)

Session Chair: Prof. Kalyana Veluvolu (Kyungpook National University, Korea (South))

[09:00 ~ 10:40]

- 8A-1 EEG based Functional Connectivity Analysis of Alzheimer's Disease Subjects.....356  
*Daijiry Narzary and Kalyana Veluvolu (Kyungpook National University, Korea (South))*
- 8A-2 A CNN-LSTM Approach to Human Activity Recognition.....362  
*Ronald Mutegeki and Dong Seog Han (Kyungpook National University, Korea (South))*
- 8A-3 deSSIde: A Clinical Decision-Support Tool for Surgical Site Infection Prediction.....367  
*Geoffrey Solano (University of the Philippines, Manila & University of the Philippines, Diliman, Philippines); Harold Mansilla and Marie Carmela Lapitan (University of the Philippines Manila, Philippines)*
- 8A-4 Classification of Colposcopy Data Using GLCM-SVM on Cervical Cancer.....373  
*Muhammad Thohir (Universitas Islam Negeri Sunan Ampel, Indonesia); Ahmad Zoebad Foady (UIN Sunan Ampel Surabaya, Indonesia); Dian Candra Rini Novitasari (Universitas Islam Negeri Sunan Ampel, Indonesia); Ahmad Zaenal Arifin (Universitas PGRI Ronggolawe, Indonesia); Bunga Phiadelvira (UIN Sunan Ampel Surabaya, Indonesia); Ahmad Hanif Asyhar (Universitas Islam Negeri Sunan Ampel, Indonesia)*
- 8A-5 Outbreak Prediction of Hepatitis A in Korea based on Statistical Analysis and LSTM Network.....379  
*Mun Kyu Lee (Chosun University, Korea (South)); Jong Ho Paik (Seoul Women's University, Korea (South)); In Seop Na (Chosun University, Korea (South))*

## Oral Sessions

### 8B: AI for Energy, Computer Systems and Semiconductor Device / Feb. 21, 2020 (Friday)

Session Chair: Prof. Yoshikazu Fukuyama (Meiji University, Japan)

[09:00 ~ 10:40]

- 8B-1 An Improved Stator Winding Short-circuit Fault Diagnosis using AdaBoost Algorithm.....382  
*Tanvir Alam Shifat and Jang-Wook Hur (Kumoh National Institute of Technology, Korea (South))*
- 8B-2 Power Demand Forecasting Using Long Short-Term Memory Neural Network based Smart Grid.....388  
*Van Hoa Nguyen, Van Bui and Yeong Min Jang (Kookmin University, Korea (South)); Joongheon Kim (Korea University, Korea (South))*
- 8B-3 Automotive Ethernet-Based Black Box System.....392  
*Yan-Xun LU, Yung-Yuan Chen and Wen-Nan Fang (National Taipei University, Taiwan)*
- 8B-4 Swarm Reinforcement Learning using DEEPSO-Q with Advantage for Operational Planning of Energy Plants.....398  
*Kenjiro Takahashi and Yoshikazu Fukuyama (Meiji University, Japan)*
- 8B-5 Intelligent Solenoid Pump Fault Detection based on MFCC Features, LLE and SVM\* .....404  
*Ugochukwu Ejike Akpudo and Jang-Wook Hur (Kumoh National Institute of Technology, Korea (South))*

### 9A: AI for Neuroscience and eHealth 2 / Feb. 21, 2020 (Friday)

Session Chair: Prof. Seokjoo Shin (Chosun University, Korea (South))

[11:00 ~ 12:40]

- 9A-1 Cervical Cancer Identification Based Texture Analysis Using GLCM-KELM on Colposcopy Data.....409  
*Dian Candra Rini Novitasari, Ahmad Hanif Asyhar and Muhammad Thohir (Universitas Islam Negeri Sunan Ampel, Indonesia); Ahmad Zaenal Arifin (Universitas PGRI Ronggolawe, Indonesia); Hanimatim Mu'jizah and Ahmad Zoebad Foady (UIN Sunan Ampel Surabaya, Indonesia)*
- 9A-2 Automatic Approach for Cervical Cancer Detection Based on Deep Belief Network (DBN) Using Colposcopy Data.....415  
*Dian Candra Rini Novitasari (Universitas Islam Negeri Sunan Ampel, Indonesia); Ahmad Zoebad Foady (UIN Sunan Ampel Surabaya, Indonesia); Muhammad Thohir (Universitas Islam Negeri Sunan Ampel, Indonesia); Ahmad Zaenal Arifin (Universitas PGRI Ronggolawe, Indonesia); Khoirun Niam (UIN Sunan Ampel Surabaya, Indonesia); Ahmad Hanif Asyhar (Universitas Islam Negeri Sunan Ampel, Indonesia)*
- 9A-3 Personality Classification by Applying k-Means Clustering.....421  
*Assem Talasbek and Azamat Serek (Suleyman Demirel University, Kazakhstan); Meirambek Zhaparov (Paragon International University, Cambodia); Seong-Moo Yoo (University of Alabama-Huntsville, USA); Yong-Kab Kim and Geun-Ho Jeong (Wonkwang University, Korea (South))*
- 9A-4 A Comparison of Machine Learning Algorithms for Fall Detection using Wearable Sensors.....427  
*Nicolas Zurbuchen (University of Applied Sciences and Arts Western Switzerland & Institute of Complex Systems, Switzerland); Pascal Bruegger (School of Engineering and Architecture - University of Applied Sciences - Western Switzerland & ICoSys Institute, Switzerland); Adriana Wilde (University of Southampton, United Kingdom (Great Britain))*

## Oral Sessions

- 9A-5      Analysis of Detecting Compensation for Robotic Stroke Rehabilitation Therapy using Imbalanced Learning and Outlier Detection.....432  
*Sean Rich U Uy (Ateneo De Manila University, Philippines); Patricia Angela Abu (Ateneo de Manila University, Philippines)*

### 9B : AI Foundation / Feb. 21, 2020 (Friday)

Session Chair: Prof. Wooyeol Choi (Chosun University, Korea (South))

[11:00 ~ 12:40]

- 9B-1      Audio Translation with Conditional Generative Adversarial Networks.....438  
*Ahmad Yunis Moussa and Hiroshi Watanabe (Waseda University, Japan)*
- 9B-2      Improving Robustness Against Adversarial Example Attacks Using Non-Parametric Models on MNIST.....443  
*SangHyeon An (Sogang University, Korea(South)); Min Jun Lee and Jungmin So (Sogang University, Korea (South))*
- 9B-3      A Method to Determine if a Test Case is Necessary using Support Vector Machine.....448  
*Satoshi Sunaga and Kazuhiro Kikuma (NTT Corporation, Japan)*
- 9B-4      A Survey of Missing Data Imputation Using Generative Adversarial Networks.....454  
*Jaeyoon Kim, Donghyun Tae and Junhee Seok (Korea University, Korea (South))*
- 9B-5      Chinese Story Generation Using Conditional Generative Adversarial Network.....457  
*Jhe-Wei Lin, Jo-han Tseng and Rong-Guey Chang (National Chung Cheng University, Taiwan)*

## Poster Sessions

### Poster session 1 : Feb. 19, 2020 (Wednesday)

Session Chair: Prof. Youn-Hee Han (Korea University of Technology and Education,  
Korea (South))

[14:00 ~ 15:40]

- P1-1 Federated Reinforcement Learning for Controlling Multiple Rotary Inverted Pendulums in Edge Computing Environments.....463  
*Hyun-Kyo Lim, Ju-Bong Kim, Chan-Myung Kim, Gyu-Young Hwang, Ho-Bin Choi and Youn-Hee Han (Korea University of Technology and Education, Korea (South))*
- P1-2 Transmission Opportunity-Based Distributed OBSS/PD Determination Method in IEEE 802.11ax Networks.....469  
*Yonggang Kim (Samsung Electronics, Korea (South)); Gyungmin Kim (GIST, Korea (South)); Taewoon Kim (Hallym University, Korea (South)); Wooyeol Choi (Chosun University, Korea (South))*
- P1-3 Hand gesture classification based on short-time fourier transform of inaudible sound.....472  
*Jinwon Cheon and Sunwoong Choi (Kookmin University, Korea (South))*
- P1-4 Topological Deep Network Embedding.....476  
*Mohammadreza Radmanesh and Ahmad Asgharian Rezaei (Royal Melbourne Institute of Technology, Australia); Nameer Al Khafaf and Mahdi Jalili (RMIT University, Australia)*
- P1-5 A Premature Ventricular Complex Detection Chip Using Convolution Neural Network.....482  
*Yu-Lun Huang and Yuan-Ho Chen (Chang Gung University, Taiwan)*
- P1-6 Implementation LSTM Algorithm for Cervical Cancer using Colposcopy Data.....485  
*Ahmad Hanif Asyhar (Universitas Islam Negeri Sunan Ampel, Indonesia); Ahmad Zoebad Foeady (UIN Sunan Ampel Surabaya, Indonesia); Muhammad Thohir (Universitas Islam Negeri Sunan Ampel, Indonesia); Ahmad Zaenal Arifin (Universitas PGRI Ronggolawe, Indonesia); Dina Haq (UIN Sunan Ampel Surabaya, Indonesia); Dian Candra Rini Novitasari (Universitas Islam Negeri Sunan Ampel, Indonesia)*
- P1-7 Automatic Detection of Epileptic Focus in Ripple and Fast Ripple Bands of Interictal iEEG based on Multi-band Analysis.....490  
*Most. Sheuli Akter; Md. Rabiul Islam and Kosuke Fukumori (Tokyo University of Agriculture and Technology, Japan); Yasushi Iimura and Hidenori Sugano (Juntendo University, Japan); Toshihisa Tanaka (Tokyo University of Agriculture and Technology, Japan)*
- P1-8 Distributed online Data Anomaly Detection for connected vehicles.....494  
*Naman Negi (Telecom Paris, France); Ons Jelassi (Telecom Paris - IPParis, France); Hakima Chaouchi (Telecom Sud Paris-Institut Mines Telecom & CNRS SAMOVAR, France); Stéphan Cléménçon (Institut Télécom Télécom ParisTech CNRS LTCI, France)*
- P1-9 Improvement of inter-protocol fairness for BBR congestion control using machine learning.....501  
*Geon-Hwan Kim (Kyungpook National University, Korea (South)); Yeong-Jun Song (Kyungpook National University(KNU), Korea (South)); You-Ze Cho (Kyungpook National University, Korea (South))*
- P1-10 Ocean Current Prediction Model Based on Machine Learning for Deciding Handover Priority in Underwater Wireless Sensor Networks.....505  
*Seok hyeon Park and Junghun Byun (Chungbuk National University, Korea (South)); Kyung-Seop Shin (Korea Advanced Institute of Science and Technology, Korea (South)); Ohyun Jo (Chungbuk National University, Korea (South))*

## Poster Sessions

- P1-11 An Overview of AI-Enabled Remote Smart-Home Monitoring System Using LoRa.....510  
*Md. Shahjalal, Moh. Khalid Hasan, Md Mainul Islam, Md. Morshed Alam, Md. Faisal Ahmed and Yeong Min Jang (Kookmin University, Korea (South))*
- P1-12 Cluster Quantity Distinguished by Geometric Angle Measurement.....514  
*Zhongyang Shen (China Mobile, China)*
- P1-13 Effective Garbage Data Filtering Algorithm for SNS Big Data Processing by Machine Learning.....520  
*Il-Kyu Ha (Kyungil University, Korea (South)); Bong-Hyun Back (Yeungnam University, Korea (South))*
- P1-14 Toward Detecting IoT Device Traffic in Transit Networks.....525  
*Guannan Hu (The Graduate University for Advanced Studies, Japan); Kensuke Fukuda (National Institute of Informatics, Japan)*

### Poster session 2 : Feb. 20, 2020 (Thursday)

Session Chair: Dr. Ronnie O. Serfa Juan (Cheongju University, Korea (South))

[11:00 ~ 12:40]

- P2-1 Burst Error Correction for Convolutional Code Concatenated with Hamming code with a block interleaver.....531  
*Shin Jihwan (Hongik University, Korea (South))*
- P2-2 Computation Offloading-Based Task Scheduling in the Vehicular Communication Environment for Computation-Intensive Vehicular Tasks.....534  
*Minyeong Gong and Sanghyun Ahn (University of Seoul, Korea (South))*
- P2-3 Hedging option contracts with locally weighted regression, functional data analysis, and Markov chain Monte Carlo techniques.....538  
*Jae Yun Jun Kim and Yves Rakotondratsimba (ECE Paris, France)*
- P2-4 A Study on Methods of Automatic Extraction of Korean-Language Modification Relationships for Sentiment analysis.....544  
*Hanjo Jeong, Jeongwon Kwak, Joonhyung Kim, Jiyoung Jang and Hyukjoon Lee (Kwangwoon University, Korea (South))*
- P2-5 Data Governance on Business/Data Dictionary using Machine Learning and Statistics.....547  
*Philip W Shin, Jinhee Lee and Seung Ho Hwang (Data Streams Corporation, Korea (South))*
- P2-6 Voltage and Reactive Power Control by Parallel Modified Brain Storm Optimization.....553  
*K. Matsumoto (Meiji University & School of Interdisciplinary Mathematical Science, Japan); Yoshikazu Fukuyama (Meiji University, Japan)*
- P2-7 Blind Synchronization for CP-OFDM Systems.....559  
*Chi-Min Li (National Taiwan Ocean University, Taiwan); Yung-Lin Hsu (National Taiwan University, Taiwan); Jen-Hao Weng (National Taiwan Ocean University, Taiwan)*
- P2-8 Implementation of Computation-Efficient Sensor Network for Kalman Filter-based Intelligent Position-Aware Application.....565  
*Jisu Kwon (Kyungpook National University, Korea (South)); Daejin Park (Kyungpook National University (KNU), Korea (South))*

## Poster Sessions

- P2-9 Bayesian Inference and Learning for Neural Networks and Deep Learning.....569  
*Sunghae Jun (Cheongju University, Korea (South))*
- P2-10 RNN-based Prediction for Network Intrusion Detection.....572  
*ShinHyuk SH Park (Suwon & Ajou univ, Korea (South)); Hyunjae Park and Young-June Choi (Ajou University, Korea (South))*
- P2-11 16QAM Turbo Decoding with Equal Probability Quantization Value.....575  
*Dae Ho Nam (University of Hongik, Korea (South))*
- P2-12 Photovoltaic Cell Defect Detection Model based-on Extracted Electroluminescence Images using SVM Classifier.....578  
*Ronnie O. Serfa Juan and Jeha Kim (Cheongju University, Korea (South))*
- P2-13 Group-based Transmission Scheduling Scheme for Building LoRa-based Massive IoT.....583  
*Joo-Sang Youn (Donggeui University, Korea (South))*
- P2-14 RNN-based Deep Learning for One-hour ahead Load Forecasting.....587  
*Van Bui, Van Hoa Nguyen, Tung Lam Pham and Yeong Min Jang (Kookmin University, Korea (South))*
- P2-15 Classification vs Regression by CNN for Handwashing Skills Evaluations in Nursing Education.....590  
*Kazushi Yamamoto, Hideaki Toyama and Fumiya Kinoshita (Toyama Prefectural University, Japan); Miho Yoshii (University of Toyama, Japan)*
- P2-16 A Sound Source-based Intelligent Context Awareness System using CNN.....594  
*Dong Myung Lee, Ho Chul Lee, Gi Ho Nam and Tae-Wan Kim (Tongmyong University, Korea (South)); Changmin Jeong (ES Solution, Korea (South))*
- P2-17 A Deep Neural Network-Based LOS Classification for Triangulation Positioning.....598  
*Chahyeon Eom and Chungyong Lee (Yonsei University, Korea (South))*

### Poster session 3 : Feb. 20, 2020 (Thursday)

Session Chair: Prof. Yasuyuki Tahara (UEC, Japan)

[14:00 ~ 15:40]

- P3-1 Estimating Twitter user's interest for inviting potential participants into Web-based debate platforms based on BERT.....602  
*Chao Cai and Shun Shiramatsu (Nagoya Institute of Technology, Japan)*
- P3-2 Using Convolutional Neural Networks for Smart Classroom Observation.....608  
*Muhammed S Khan (Regis University, USA); Imran A. Zualkernan (American University of Sharjah, United Arab Emirates)*
- P3-3 Deep LSTM and GAN based Short-term Load Forecasting Method at the Zone Level.....613  
*Jianguang Zhang (State Grid Shaoxing Power Supply Company, China); Xuyang Zhang (State Grid Zhejiang Shengzhou Power Supply Co., Ltd., China); Jianfeng Yang (State Grid Shaoxing Power Supply Company, China); Zhaoxu Wang (State Grid Zhejiang Shengzhou Power Supply Co., Ltd, China); Yufan Zhang, Qian Ai, Zhaoyu Li, Ziru Sun and Shuangrui Yin (Shanghai Jiao Tong University, China)*

## Poster Sessions

- P3-4 **Generalized Load Modeling Method Based on Clustering and Neural Network.....619**  
*Wenbo Li (State Grid Shandong Electric Power Research Institute, China); Luhua Xing (State Grid Shandong Electric Power Research Institute & State Grid Corporation of China, China); Kaiyi Huang and Qian Ai (Shanghai Jiao Tong University, China); Liang Wang (State Grid Shandong Electric Power Research Institute, China)*
- P3-5 **Object Detection Using Vision and LiDAR Sensor Fusion for Multi-channel V2X System.....623**  
*Gyu Ho Lee (Kyungpook National University, Korea (South)); JiDong Choi (80 Daehak-ro Buk-gu Daegu Republic of Korea & Kyungpook National University, Korea (South)); Jong Hyuk Lee (Kyungpook National University, Korea (South)); Min Young Kim (Kyungpook National University, Korea (South))*
- P3-6 **Blockchain-based Energy Transaction Model for Electric Vehicles in V2G Network.....628**  
*Md Mainul Islam, Md. Shahjalal, Moh. Khalid Hasan and Yeong Min Jang (Kookmin University, Korea (South))*
- P3-7 **Various Forms of Finite Memory Structure Filter for Discrete-Time State-Space Model.....631**  
*Pyung Soo Kim and Min Hui Kim (Korea Polytechnic University, Korea (South))*
- P3-8 **Coresets for PCB Character Recognition based on Deep learning.....637**  
*Sumyung Gang, Ndayishimiye Fabrice and Joon-Jae Lee (Keimyung University, Korea (South))*
- P3-9 **A Survey of Deep Learning and Its Application in Distribution Network.....643**  
*Xiaomin Yin, Xiandong Li, Yan Zhang, Tao Zhang and Chunhui Lu (State Grid Liaocheng Power Supply Company, China); Qian Ai, Zhaoyu Li and Ziru Sun (Shanghai Jiao Tong University, China)*
- P3-10 **3D-CNN with residual sub-blocks for automatic detection of lung nodules from temporal subtraction Images.....647**  
*Yuriko Yoshino (Kyushu Institute of Technology, Japan)*
- P3-11 **A Black Box Modeling Technique for Distortion Stomp Boxes Using LSTM Neural Networks.....653**  
*Naofumi Aoki (Hokkaido University, Japan)*
- P3-12 **Brain-inspired Method for Hyper-connected and Distributed Intelligence.....657**  
*Sang Ki Kim and Sunme Kim (ETRI, Korea (South))*
- P3-13 **Performance Analysis of Fingerprint Matching Algorithms for Indoor Localization.....661**  
*Alwin Poulouse and Dong Seog Han (Kyungpook National University, Korea (South))*
- P3-14 **The Diffusion Barriers of AI Mobility Service: the case of TADA.....666**  
*Sungwon Kim, Hyunae Park and Hwansoo Lee (Dankook University, Korea (South))*
- P3-15 **Facial Keypoint Detection with Convolutional Neural Networks.....671**  
*Savina Colaco and Dong Seog Han (Kyungpook National University, Korea (South))*
- P3-16 **Machine learning based SRM control using FPGAs for torque ripple minimization.....675**  
*Srinivasan Kandhasamy (Robert Bosch Engineering and Business Solutions, India)*



## Poster Sessions

### Poster session 4 : Feb. 21, 2020 (Friday)

Session Chair: Prof. Yeong Min Jang (Kookmin University, Korea (South))

[09:00 ~ 10:40]

- P4-1 An Overview of Gaussian process Regression for Volatility Forecasting.....681  
*Bingqing Liu, Ivan Kiskin and Stephen Roberts (University of Oxford, United Kingdom (Great Britain))*
- P4-2 Visualizing the Malicious of Your Network Traffic by Explained Deep Learning.....687  
*Tsung-Yu Ho, Wei-An Chen, Ming-Kung Sun and Chiung-Ying Huang (Acer Cyber Security Inc., Taiwan)*
- P4-3 Are you an Introvert or Extrovert? Accurate Classification with only ten Predictors.....693  
*Chaehan So (Yonsei University, Korea (South))*
- P4-4 Regional Weighted Generative Adversarial Network for LDR to HDR Image Conversion.....697  
*SungWoon Jung, Dong-Min Son, Hyuk-Ju Kwon and Sung-Hak Lee (Kyungpook National University & School of Electronics Engineering, Korea (South))*
- P4-5 Design of Modular Battery Management System with Point-to-point SoC Estimation Algorithm.....701  
*Angela Caliwag, Kumbayoni Lalu Muh, Sohee Kang and Wansu Lim (Kumoh National Institute of Technology, Korea (South))*
- P4-6 A Study on Automatic Music Genre Classification Based on the Summarization of Music Data.....705  
*Naofumi Aoki (Hokkaido University, Japan)*
- P4-7 MAC Protocol Design Optimization Using Deep Learning.....709  
*Hannaneh Barahouei Pasandi and Tamer Nadeem (Virginia Commonwealth University, USA)*
- P4-8 Automatic Control Approach of Reactive Power Compensation of Smart Grid.....716  
*Md. Morshed Alam, Md. Faisal Ahmed and Yeong Min Jang (Kookmin University, Korea (South))*
- P4-9 Exploratory Study on Correlations between Students' Characteristics and Effects in the Case of Online Learning on University Students.....720  
*Ryo Sugawara (Meisei University, Japan); Shun Okuhara (Fujita Health University, Japan); Yuki Fukuyama (Meisei University, Japan); Yoshikazu Sato (Kyushu University, Japan)*
- P4-10 Digital Assistant for the Visually Impaired.....723  
*Ezekiel Marvin (Universitas Prasetya Mulya, Indonesia)*
- P4-11 Optical Camera Communication Application using Display Modulation.....729  
*Hoan Nguyen, Van Hoa Nguyen and Yeong Min Jang (Kookmin University, Korea (South))*
- P4-12 Edge Camera based Dynamic Light Control System for Smart Streetlights.....732  
*Jang Woon Baek (ETRI, Korea (South))*
- P4-13 Machine Learning Model for Indoor Localization Algorithm using GPS and Smart Watch.....735  
*Ho Chul Lee and Dong Myung Lee (Tongmyong University, Korea (South))*
- P4-14 Study of drowsiness from simple physiological signals testing.....738  
*Noppawit Aeimpreeda, Charat Thothong, Pornkanok Sukaimod, Pinkaew Khongsabai and Direk Sueaseenak (Srinakharinwirot University, Thailand)*
- P4-15 EEG-Based Motor Imagery Classification Using Novel String Grammar Fuzzy K-Nearest Neighbor Techniques with One Prototype in Each of Classes.....742  
*Payungsak Kasemsumran (Maejo University, Thailand); Ekkarat Boonchieng (Chiang Mai University, Thailand)*