3rd International Conference on
Advanced Engineering and ICT-Convergence 2019
(ICAIEIC-2019)

July 11-13, 2019

Jeju International University, Jeju, Korea

Organized by

ICT –Advanced Engineering Society, Seoul, Korea (ICT-AES)
Bima Build. #525, 20 Kwangwoon-ro, Nowon-gu, Seoul, Korea (01897)
Email: info@ictaes.org, Tel.: +82-2-940-8626 / 8637

Sponsored by

Jeju International University, Jeju Island, Korea
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Tel +82-064-754-0200, Fax +82-064-702-0933
Welcome Remarks

Chairman of ICT-Advanced Engineering Society
Prof. Jaesoo Yang
Dankook University, Korea.

Ladies and gentlemen,
It is my great honor to welcome you to this 3rd International Conference on Advanced Engineering and ICT-Convergence (ICAEIC-2019) organized by ICT-AES. The 1st ICAEIC-2018 was in Seoul, Korea and the 2nd ICAEIC-2019 was in Kathmandu, Nepal. After this conference, the 4th ICAEIC-2020 will be held in Hochiminh, Vietnam as well. As you know that this beautiful city, Jeju Island was formed by the interruption of an underwater volcano approximately 2 million years ago and is very famous for popular holiday destination. I hope, this will be a common platform to expose, and share a new emerging technology like IoT, AI, Big-data, ICT-Convergence and so on which will be helpful to one another and will also be a good opportunity to meet the different people from world and to share experiences and encourage in the scientific researches. We have total 6th tracks and 4 special sessions with various fields. We have gathering here from Spain, Australia, India, Pakistan, Bahrain, Philippine, and Nepal in Korea to share the research experiences. The ICAEIC-2019 will include the presentation of papers with recent research results, keynote speakers, Prof. Brian Cusack from Australia, Prof. Sudan Jha from India, and invited speakers, Prof. Javier Martinez from Spain, and Prof. Wael Mohamed Mohamed Mohamed Elmedani from Bahrain. I want to express my gratitude to all speakers for their outstanding contribution in the conference.

Many members of the organizing team worked very hard to turn our initial visions for this conference into reality, with special thanks going to Prof. Conference Chair, Prof. Daeyoung Kim Conference Co-chair, Prof. Soonchul Kwon, International Chair, Prof. Bhanu Shrestha. We would like to warmly thank to honorary chairs, Prof. Jong-Young Lee and Lochan Lal Amatya and all other organizing committee members for their dedication for the conference. My special thanks go to the president and all staffs of this Jeju International University, who support us venue and all other management for the conference.

Ladies and gentlemen,
I am sure you all will have fruitful and rewarding exchanges during the conference period and I wish you all every success with this important conference.

Thank you very much.

July 11, 2019
It is a great pleasure for me indeed to extend to all of you a cordial welcome on behalf of the organizing committee as well as Jeju International University. As you know that this is the era of 4th industrial revolution and we are preparing for this with various state-of-art-technologies. During the conference, we have 6 tracks and 4 special sessions on emerging topics. In this regard, I strongly believe that this conference, under the theme of “Advanced Engineering and ICT-Convergence” is of great significance in the sense that it provides us with a platform to discuss, to share, to explore, and to experience the recent technologies as well.

I hope that this conference will play a key role in promoting future technologies, intellectual and academic coordination and it will also establish a common ground to make significant contribution to further research both locally and internationally.

I would really like to congratulate and heartily welcome all the participants especially from Spain, Australia, India, Pakistan, Philippine, Bahrain, and Nepal. I strongly hope and know that you will find the conference extremely stimulating and enjoyable. After this conference, you can enjoy by visiting various places of Jeju city and experience new environment.

I am also very happy to announce that the next international conference will be held in Hochiminh, Vietnam on January 10-12, 2020 and I hope that you all will be there next year as well.

Thank you.

July 11, 2019
Conference Program (ICAEIC-2019)

Day 1 / Thursday, July 11, 2019

10:00 – 11:30  Paper Registration & Meeting
10:00 – 10:15  Organizing Committee Meeting
10:00 – 11:30  Paper Registration

11:30 – 13:00  Lunch Break

13:00 – 13:20  Opening Ceremony  Main Hall
13:00 – 13:10  Welcoming & Opening Remarks by Chairman of ICT-AES
13:10 – 13:20  Congratulatory Remarks by President of Jeju Int’l Univ.

13:30 – 14:00  Keynote Speech by Prof. Dr. Brian Cusack, Australia  Main Hall

14:00 – 14:30  Keynote Speech by Prof. Dr. Sudan Jha, India  Main Hall

14:30 – 16:00  Technical Session (Oral Session) 1-1  Main Hall
Session Chair:  Prof. Dr. Javier Martinez,
               Prof. Dr. Chae-Bong Sohn

14:30 – 16:00  Special Session A-1  Hall A
Session Chair:  Dr. Park Jeong Hwan,
               Prof. Dr. Rajendra Dhakal,
               Invited Speech, Testworks (CEO), Suk-won Yoon

14:30 – 16:00  Special Session C-1  Hall B
Session Chair:  Prof. Dr. Ryu-Ki Whan,
               Prof. Dr. Surendra Shrestha

16:00 – 16:10  Coffee Break

16:10 – 17:50  Technical Session (Oral Session) 1-2  Main Hall
Session Chair:  Prof. Dr. Surendra Shrestha,
               Prof. Dr. Jinho Han
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<tr>
<th>Time</th>
<th>Session/Event</th>
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<tr>
<td>16:10 – 17:50</td>
<td>Special Session A-2</td>
<td>Hall A</td>
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<td>Session Chair: Dr. Joon Ik, Kong, Prof. Dr. Sahira Joshi</td>
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<td>Invited Speech, Smartmind (CEO), Sangsoo Leen</td>
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<td>16:10 – 17:50</td>
<td>Special Session C-2</td>
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<td>Session Chair: Prof. Dr. Rajendra Dhakal, Prof. Dr. Ryu-Ki Whan</td>
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Day 2 / Friday, July 12, 2019

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<th>Time</th>
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<tr>
<td>10:00 – 11:30</td>
<td>Technical Session (Oral Session) 2-1</td>
<td>Main Hall</td>
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<td>Session Chair: Prof. Dr. Javier Martinez, Prof. Dr. Kwang Chul Son</td>
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<td>10:00 – 11:30</td>
<td>Special Session C-3</td>
<td>Hall A</td>
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<td>Session Chair: Prof. Dr. Seungkwon Lee, Prof. Dr. Chae-Bong Sohn</td>
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<tr>
<td>10:00 – 11:30</td>
<td>Special Session E-1</td>
<td>Hall B</td>
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<td>Session Chair: Prof. Dr. Sang Hyun Lee, Prof. Dr. Surendra Shrestha</td>
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<td>11:30 – 13:00</td>
<td>Lunch Break</td>
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<td>13:00 – 17:10</td>
<td>Poster Session</td>
<td>Hall C</td>
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<td>Evaluation Committee: Prof. Dr. Bhanu Shrestha, Prof. Dr. Rajendra Dhakal, Prof. Dr. Youngman Kwon, Prof. Dr. Seungkwon Lee, Prof. Dr. Soonchul Kwon</td>
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<td>Technical Session (Oral Session) 2-2</td>
<td>Main Hall</td>
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<td>Session Chair: Prof. Dr. Surendra Shrestha, Prof. Dr. Sahira Joshi</td>
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<td>14:00 – 15:30</td>
<td>Special Session D-1</td>
<td>Hall A</td>
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<td>Session Chair: Prof. Dr. Hae Jong Joo, Prof. Dr. Javier Martinez</td>
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<td>14:00 – 15:30</td>
<td>Special Session E-2</td>
<td>Hall B</td>
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<td>Session Chair: Prof. Dr. Rajendra Dhakal, Prof. Dr. Sang Hyun Lee</td>
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<td>15:30 – 15:40</td>
<td>Coffee Break</td>
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<td>15:40 – 17:10</td>
<td>Technical Session (Oral Session) 2-3</td>
<td>Main Hall</td>
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<td>Session Chair: Prof. Dr. Rajendra Dhakal, Prof. Dr. Rajeshwar Man Shrestha</td>
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<td>15:40 – 17:10</td>
<td>Special Session D-2</td>
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<td>Session Chair: Prof. Dr. Surendra Shrestha, Prof. Dr. Hae Jong Joo</td>
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<td>15:40 – 17:10</td>
<td>Special Session E-3</td>
<td>Hall B</td>
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<td>Session Chair: Prof. Dr. Jinho Han, Prof. Dr. Sang Hyun Lee</td>
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<td>17:10 – 17:40</td>
<td>Invited talk by Prof. Dr. Javier Martinez, Spain</td>
<td>Main Hall</td>
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<td>17:40 – 18:10</td>
<td>Award Ceremony and Photo Session</td>
<td>Main Hall</td>
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<td>18:10 – 20:10</td>
<td>Banquets</td>
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Day 3 / Saturday, July 13, 2019

10:00 –11:00    Organizing Committee Meeting

11:00 –17:00    Individual Technical Tour & Jeju Island Tour

Preparation for Presentation

● All registered presenters are requested to attend the opening ceremony.
● Please confirm the room number you have assigned in terms of a poster and oral sessions.
● Each presentation will have 20 minutes for presentation including 5 minutes Q/A time.
● Each presenter must copy your presentation files to the computer guided by the volunteers.
Welcome Remarks

Day 1 / Thursday, July 11, 2019

Time: 10:00 – 11:30
10:00 – 10:15 Organizing Committee Meeting
10:00 – 11:30 Paper Registration

Time: 13:00 – 13:20
Opening Ceremony
13:00 – 13:10 Welcoming & Opening Remarks by Chairman of ICT-AES
13:10 – 13:20 Congratulatory Remarks by President of Jeju Int’l Univ.

Time: 13:30 – 14:30
Keynote Speech
13:30 – 14:00 Prof. Dr. Brian Cusack, Australia
Title: Extracting Value from the new International Digital Forensic Standards

14:00 – 14:30 Prof. Dr. Sudan Jha, India
Title: Deep Learning Approach for Software Maintainability Metrics Prediction

Time: 14:30 – 16:00
Presentation (Oral) Session 1-1
Session Chair: Prof. Dr. Javier Martinez / Prof. Dr. Chae-Bong Sohn

ICAEIC-2019-072
Cebu Provincial Detention and Rehabilitation Center Inmate Profiling, Pri Sohn Cell and Case Management
(Ken Gorro, Mark Quevedo, Kim Gorro, Brenette Abrenica, Rogelio Bag-ao, Jose Glenn Capanas)
ICAEIC-2019-078
DASH-UAV: Dynamic HTTP Adaptive Streaming Over Unmanned Aerial Vehicle Networks
(Heejae Han, Chahun Lee, Inho Jung, Seokgyu Lee, Jaehyun Lee, Dongho Kim)

ICAEIC-2019-0739
Selecting Facial Features for Machine Learning
(Jinho Han)

ICAEIC-2019-0792
The Impact of Technologies in Management education of NEPAL
(Mithlesh Kumar Jha, Surendra Shrestha, Subarna Shakya)

ICAEIC-2019-0731
Analysis of privacy disclosure risk in CPS
(Min Kyoung Sung, Yong Sung Kim)

Special Session A-1
Room – Hall A
Session Chair: Dr. Park Jeong Hwan / Prof. Dr. Rajendra Dhakal

Invited Speech, Testworks (CEO), Suk-won Yoon
Title: (Case Study) AI data annotation & management in CPS

ICAEIC-2019-0714
A Study of a Medical CPS Standard Evaluation Model: MCPSSE
(Ju-Yuck Han, Jung-Hwan Park, Ki-Won Song)

ICAEIC-2019-0740
A Study on development of test automation framework for a medical software
(Kidu Kim, Kwanglak Jung, Gwanghun Kim)
ICAEIC-2019-0782
Software Visualization Approach for Performance Measurement of Object-Oriented Code based on Cyber-Physical Systems (CPS) Software
(Bo Kyung Park, Geun-Hee Kang, R. Young Chul Kim)

ICAEIC-2019-0795
On the Construction of Virtual Verification System Utilizing Unstructured Data for Reliability/Safety of Autonomous Driving Vehicles
(Kim Tong Hyun, Kim Young Min)

Special Session C-1
Room – Hall B
Session Chair: Prof. Dr. Ryu-Ki Whan / Prof. Dr. Surendra Shrestha

ICAEIC-2019-0726
A Study on Recommendation of Tourism Types according to MBTI Personality Types
(Su Hyun Yun, Dai Yeol Yun, Ki Hwan Ryu)

ICAEIC-2019-0729
A Study on the Recommendation of Food Using Big Data
(Tae Gyeong Lee, Hye Sook Kim, Chung Hun Chung)

ICAEIC-2019-0732
Personalized wine recommender system
(Soo Jin Myung, Seok Jae Moon, Hyeon Kon Son)

ICAEIC-2019-0743
Cooperation Strategies for Enterprise Market Share: Establish ecosystem based on sharing membership
(Ki Hak Yang, Ki Hwan Ryu)
ICAEIC-2019-0744
Study on Accessibility of Wine Consumption through Mariage and QR code
(Ki-HyukSung, Ki-HwanRyu)

Time: 16:00 – 16:10 Coffee Break

Time: 16:10 – 17:50

Presentation (Oral) Session 1-2
Room - Main Hall
Session Chair: Prof. Dr. Surendra Shrestha / Prof. Dr. Jinho Han

ICAEIC-2019-0787
GSM network optimization technique in urban area
(Sudip Regmi, Surendra Shrestha)

ICAEIC-2019-073
Highly Flexible Document Workflow using NoSQL
(Ken Gorro, Mark Quevedo, Kim Gorro, Brenette Abrenica, Rogelio Bag-ao, Kay Conales, John Rafael Arañas)

ICAEIC-2019-0741
White-Box Testing of Convolutional Neural Network
(Hyung-Ho Kim)

ICAEIC-2019-0725
An Analysis of Modified Fibonacci Backoff Algorithm for 802.11 DCF
(Sangyeon Kim, Sungwook Ko, Kangwoo Lee, Younsoon Shin)

ICAEIC-2019-0786
Dwindling Stage of Postal Services in an Underdeveloped Country
(Robert Khanal, Surendra Shrestha)
Special Session A-2

Session Chair: Dr. Joon Ik, Kong / Prof. Dr. Sahira Joshi

Invited Speech, Smartmind (CEO), Sangsoo Leen
Title: Modern Big Data Analytics and Data Science

ICAEIC-2019-0768
A Study on Timing Issue Analysis of Cyber-Physical Systems
(Joon-Ik Kong)

ICAEIC-2019-0775
Emergent Failure Effects on Dependability of Cyber-Physical Systems
(Taihyong Yim)

ICAEIC-2019-0777
Requirements for Scalable CPS of Smart City
(Joonho Kwak)

ICAEIC-2019-0783
Performance Measurement of Procedural Code for CPS Multiple-Joint Robotics Simulator
(Bo Kyung Park, Geun-Hee Kang, R. Young Chul Kim)

ICAEIC-2019-0796
System of System Engineering Method for Rotary Wing Flight Safety Verification under Icing Condition
(Koo Bon Wook, Yoon Yoo mi, Kim Young Min)
Special Session C-2 Room – Hall B
Session Chair: Prof. Dr. Rajendra Dhakal / Prof. Dr. Ryu-Ki Whan

ICAEIC-2019-0746
The Effect of Social Network Service Marketing of Theme Park Event Program on the Visitors’ Utilization & Satisfaction
(Ji eun Lee, Hyeung jun Roh, Kyung mi You)

ICAEIC-2019-0747
The Effect of the Job Environment of Chinese Restaurant Cook on Job Passion : Focusing on self-conscious control effect
(Hyun Keun Jeon, Hye Sook Kim, Chung Sub Shin)

ICAEIC-2019-0748
Analysis of the Structural Relationship of Restaurant-service Employees between Self-Development Needs and Organizational Commitment and Job Performance
(Hyo Jin Lee, Gyu Sam Hwang)

ICAEIC-2019-0749
Research on Mobile Application for Revitalization of Traditional Market
(Seon Heui Kim, Hyun Kon Son)

Day 2 / Friday, July 12, 2019

Time : 10:00 –11:30

Presentation (Oral) Session 2-1 Room - Main Hall
Session Chair: Prof. Dr. Javier Martinez / Prof. Dr. Kwang Chul Son
ICAEIC-2019-071
Qualitative Technology Acceptance Evaluation of JIRA in Software Development using Machine Learning
(Ken Gorro, Kim Gorro, Anthony Ilano, Archival Sebial, Elmo Ranolo, Edita Vale)

ICAEIC-2019-0711
Autonomous Mobile Listening Nodes in Ad-hoc System for Counter UAV Detection
(Da-eun Kim, Seo-jeong Choi, Dongho Kim)

ICAEIC-2019-0710
Synthesis of Magnetic Activated Carbon Composite Derived from Sugarcane Bagasse for Arsenic Adsorption
(Sahira Joshi, Rajeshwar Man Shrestha, Anshu Kumari)

ICAEIC-2019-0720
Proposal of Cluster Head Election Method in Clustering based WSN Protocol
(Do-Hyeoun Cho, WooSuk LEE, Taehyeon KIM, Kye-Dong Jung, Jong-Yong Lee)

ICAEIC-2019-0776
IoT Based Queen Bee Territory Control System
(Kyeong Seok Jang, Kwang Seob Shin, Chang-Soon Kim, Bhanu Shrestha, Kwang Chul Son)

Special Session C-3
Room – Hall A
Session Chair: Prof. Dr. Seungkwon Lee / Prof. Dr. Chae-Bong Sohn

ICAEIC-2019-0760
Use VR Technology in Application: VRchat
(Ji-sun Chae, Sun-ki Song)

ICAEIC-2019-0762
Urban Regeneration and the Activation Plan on Urban Tourism Focused on Gwangju Folly and Naoshima in Japan
(Jeong O Choi, Seungkwon Lee)
ICAEIC-2019-0764
Study upon Fragments appeared in the Tanztheater of Pina Bausch: In association with the ‘Defamiliarization’ of epic dramas made by Bertolt Brecht
(Jung Seung-Ah, Lee Seung-Kwon)

ICAEIC-2019-0765
A Study on Cultural Adaptation of Korean Students in Jordan
(Kim keamryoun)

Special Session E-1
Room – Hall B
Session Chair: Prof. Dr. Sang Hyun Lee / Prof. Dr. Surendra Shrestha

ICAEIC-2019-0788
A Study of Wearable Devices for the Hearing Impaired using Arduino
(Dong-Won Jeong, Gyu-Seong Heo, Jeong-Hun Choi, Kyo-Chan Lee, Sang-Hyun Lee)

ICAEIC-2019-076
A Multi-chain Topology for Energy Efficient WSNs in IoT Environment
(Se-Jung Lim, Sang-Hyun Lee)

ICAEIC-2019-0723
A Study on Smart Delineator to Prevent Second Traffic Accident
(Young Keon Hong, Heon Jeong)

ICAEIC-2019-0727
A Study on the Numerical Computation Using the Distributed System
(Gyu-seong Heo, Dong-won Jeong, Sang-Bum Kim, Sang-Hyun Lee)

ICAEIC-2019-0733
A Removing Method for the Influence of Hidden Malicious Code in Image File
(Dong-Seob Jung, Sang-Joon Lee)
Time: 11:30 – 13:00  Lunch Break

Time: 13:00 – 17:10

Poster Session

Evaluation Committee: Prof. Dr. Bhanu Shrestha
Prof. Dr. Rajendra Dhakal / Prof. Dr. Youngman Kwon
Prof. Dr. Seungkwan Lee / Prof. Dr. Soonchul Kwon

ICAEIC-2019-0717
A Survey on Routing Protocols Using Fuzzy Logic for Wireless Sensor Networks
(Oh Seok Kwon, SeaYoung Park, Cheol Lee, Kye-Dong Jung, Jong-Yong Lee)

ICAEIC-2019-0718
Development of One Board Multi-Video Control O2O System
(SeaYoung Park, WooSuk Lee, Kye-Dong Jung, Ahn-na Lim, Jong-Yong Lee)

ICAEIC-2019-0722
An Iterative Decoding Scheme for Error Control Codes in Communication Networks
(Yong-Geol Shim)

ICAEIC-2019-0719
A Stochastic Mobility Model Design with Stability and Energy-Efficiency
(Jungsuk Lee, Dai Yeol Yun, SeaYoung Park, Kye-Dong Jung, Jong-Yong Lee)

ICAEIC-2019-0728
A Study on the Nurtured of ICT Integrated Tourism Professionals in the 4th Industrial Revolution Environment
(Ki-Hwan Ryu, SeokJae-Moon, Chung-Sun Hong)
ICAEIC-2019-0730
Proposal of Improvement Algorithm of Cluster-based Protocol in Wireless Sensor Network
(SangCheol Lee, Seungwon Lee, Kye-Dong Jung, Jong-Yong Lee)

ICAEIC-2019-0738
Design and Implementation of Blockchain based Vehicle Information Management System Using LoRaWAN
(Jeong-Hwan Choi, Byeong-Seok Oh, Jin-Soo Lee, Jun-Hyun Yang, Min-Soo Park, Kang-woo Lee, Youn-Soon Shin)

ICAEIC-2019-0742
Automation System Modules for Building Control
(Jong-Yong Lee, Kye-Dong Jung, Seok-Jae Moon)

ICAEIC-2019-0750
Performance Evaluation of Feature Detection and Description in Image-Based 3D Model Reconstruction
(Jahangeer Hafeez, Seung-Hyun Lee, Soon-Chul Kwon)

ICAEIC-2019-0754
Design of Dynamically Tuned Gyroscope using the Estimation of Error Coefficient Method for Sensing High Rotation
(Cheol Lee, Jae-Jung Ryu)

ICAEIC-2019-0755
A Study on Normalization of Input Data for Ontology based Machine Learning
(ChiGon Hwang, Jong-Yong Lee, Kye-Dong Jung)

ICAEIC-2019-07104
Applying Dilated Convolution to Improve Performance of Very Deep Super Resolution
(Young-Man Kwon, Seung-Hyeok Jang, Gyu-Bong Lee, Won-Mo Gal)
ICAEIC-2019-0781
Bandstop Filter Design Using PET Substrate
(Bhanu Shrestha)

ICAEIC-2019-0763
Effective Deep Learning Data Augmentation Method using Geometric Characteristics
(Sooyoung Cho, Chanil Park, Sang-Geun Choi, Chae-Bong Sohn)

ICAEIC-2019-0767
Motion Effect Generating System for 4D Films
(Daeyeol Kim, Suyeong Oh, Sang-Geun Choi, Jin Sol Choi, Eunsu Goh, Kyu Jung Choi, Chae-Bong Sohn)

ICAEIC-2019-0798
Safe Driving and Navigation of the Mobile Robot
(Junghwan Ko)

ICAEIC-2019-0799
Development of home control platform for user interface
(Seongsoo Cho, Young-Sik Kim, Changho Seo)

ICAEIC-2019-075
Modified Inverted-F Antenna with Pillar Structure
(Taesoon Yun)

ICAEIC-2019-0779
Safety System Design for Danger Preceding by Real-Time Serial Arc Waveform Analysis
(Jeong Seong, Jeong Yoojin, Chan Hyeong Park, In-Young Chung, Kwang-Chul Son, Soon-Chul Kwon, Chae-Bong Sohn)
ICAEIC-2019-0780
Falling Recognition System using Smartphone based Deep Learning
(TaeWoo Kwon, Jong-Yong Lee, Kye-Dong Jung)

ICAEIC-2019-0766
A Study on the Japanese Translation of ‘Omae Gwangju’ Tourism Guide
(Hyosook Park)

ICAEIC-2019-07105
N-gram MVSC Algorithm for Malware Detection and Classification
(Young-Man Kwon, Jae-Ju An, So-Hee Jun, Myung-Jae Lim)

ICAEIC-2019-0761
A Study of the Fourth Industrial Revolution and Traditional Culture Contents (Focused on Folk Painting)
(Shin Jin-hee)

Time: 14:00 – 15:30

Presentation (Oral) Session 2-2 Room - Main Hall
Session Chair: Prof. Dr. Surendra Shrestha / Prof. Dr. Sahira Joshi

ICAEIC-2019-0756
Characterization and Utilization of the Chemically Modified Biosorbent for Removal of Heavy Metal from Waste Water
(Bindra Shrestha, Jagjit Kour)

ICAEIC-2019-0712
Thermal and Visible Image Capturing System for PV Module using Drone
(Tae Won Choi, Tae Sung Choi, Heon Jeong)
ICAEIC-2019-079
Adsorption Behavior of Ni (II) on Activated Carbon Prepared from Coconut (Cocos nucifera) shell
(Shrestha Rajeshwar Man, Joshi Sahira, Gangasagar Gaudel Sharma)

ICAEIC-2019-0721
Prediction of Raw Material Demand Analysis in Comparing Models
(WooHyun Park, YeHan Jang, SangSang Jean, YoonSoo Choi)

Special Session D-1
Room – Hall A
Session Chair: Prof. Dr. Hae Jong Joo / Prof. Dr. Javier Martinez

ICAEIC-2019-0715
Generation of Body Type 3D Model using 2D Images and a Body Object Generative Adversarial Network Model
(Changgyun Kim, Sekyoung Youm)

ICAEIC-2019-0716
Tomato Trade Volume Prediction System Using Nonghyup Tomato Big Data and Data Mining Methodology
(Chaemin Im, Changgyun Kim, Sekyoung Youm)

ICAEIC-2019-0724
An Architecture of Scalable On-line Process Anomaly Detection System in Smart Factory
(Seunghyun Choi, Il-Ha Park, Hyun-Deuk Kim, Sekyoung Youm, Yong-Shin Kang)

ICAEIC-2019-0770
Proposal for a WEB-based VR Data Authoring Tool and Content Sharing Mechanism
(Pill-Won Park, Haejong, Joo)

Special Session E-2
Room – Hall B
Session Chair: Prof. Dr. Rajendra Dhakal / Prof. Dr. Sang Hyun Lee
ICAEIC-2019-077
Study on an Energy Efficient Chain Formation for WSNs in the IoT Environment
(Se-Jung Lim, Gwang-Jun Kim)

ICAEIC-2019-0713
Development of Gimbal Controller with Image Processing for Analysis of Photovoltaic Modules
(Tae Won Choi, Tae Sung Choi, Heon Jeong)

ICAEIC-2019-0734
Response Time Assumption for Cyber Threat Intelligence in Security Operation Center of Critical Infrastructures
(Choong-Hee Han, Sang-Joon Lee)

ICAEIC-2019-0735
The Research on Blockchain System Participation Intention
(Hu Chenxi, Chen Qiuying, Sang-Joon Lee)

ICAEIC-2019-0736
Users’ Continuance Intention to Use Social Q&A Communities
(Qin ying, Wei Qiannan, Sang-Joon Lee)

Time : 15:30 – 15:40         Coffee Break

Time : 15:40 – 17:10

Presentation (Oral) Session 2-3
Room - Main Hall
Session Chair: Prof. Dr. Rajendra Dhakal / Prof. Dr. Rajeshwar Man Shrestha

ICAEIC-2019-0790
Quality Assessment in Engineering Education for Better Job Opportunity in Nepal
(Rajendra Kumar Joshi1, Milly Joshi)
ICAEIC-2019-0791
Improving Network Security of Internet of Things by Controlling Abnormal Traffic
(Yoon Min Yang, JaeSoo Yang)

ICAEIC-2019-0797
A Comparative Study of Examination System in Formal and Distance Education System at Secondary Level in Pakistan
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Title: Cognitive Internet of Things: Concepts, Applications, and Security Challenges |

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ICT-AES Publications
Keynote Speaker

Prof. Dr. Brian Cusack

Graduate Research Institute Australia, Director of the Cyber Forensic Research Center in Auckland, New Zealand

Title: “Extracting Value from the new International Digital Forensic Standards”

Prof. Dr. Brian Cusack is the Director of the Cyber Forensic Research Centre in Auckland and oversees research and doctoral programs. The Research Center has 300+ Publications, 80+ PhD and thesis Graduates, and was awarded the best Research Center in Australasia in 2013. It also holds an annual International conference and winter lecture series. Dr Cusack is Professor to the Graduate Research Institute and adjunct professor to the Security Research Institute Australia. He is a long-standing member of IEEE, AIS and ISACA, and has Board and Platinum status. In addition to leading University research centers and institutes since 1999, he is an International Standards negotiator for the last 18 years. He has edited to publication a number of security and forensic ISO standards – the most recent being the ISO/IEC 27050-2 published in November 2018.
Keynote Speaker

Prof. Dr. Sudan Jha.

School of Computer Engineering, KIIT University, India

Title: “Deep Learning Approach for Software Maintainability Metrics Prediction”

Prof. Dr. Sudan Jha was born in Korea. He received the B. S., and M.S. degrees from Dankook University, and Yonsei University, Seoul, Korea, and California CN University, USA respectively. He graduated Ph.D. degree majoring IS/Ubiquitous from KAIST, Korea.
Invited Speaker

Prof. Dr. Javier Martinez Rodrigo

*ISOM Institute for optoelectronics systems and microtechnolog, Technical University of Madrid (UPM)*

**Title:** “Smart Oriental Health Decision System”

Prof. Dr. Javier Martinez Rodrigo received a PhD degree in Physics and a graduate degree in Electronic Engineering from the Universidad de Valladolid (Spain). His postdoctoral stage was at the Lawrence Berkeley National Laboratory (USA) working in nanotechnology. Since 2011, is a Professor I3 at the Technical University of Madrid in the Institute of Optoelectronic Systems and Micronanotechnology (ISOM). His research interest is focus in the development of nanoelectronic devices fabricated with graphene for energy applications.
Invited Speaker

Prof. Dr. Wael Elmedany

Computer Engineering at University of Bahrain, Kingdom of Bahrain


Prof. Dr. Wael Elmedany is currently an associate professor of Computer Engineering at University of Bahrain, Kingdom of Bahrain, and senior member of IEEE society. Elmedany holds a PhD degree in Electrical Engineering, Manchester University, UK, 1999; MSc degree in computer communications, Menoufia University, Egypt, 1991; BSc degree in Electronic Engineering, Menoufia University, Egypt 1987. Elmedany was assistant professor of computer communications, department of Electrical Engineering, Cairo University, Fayoum branch, 2000-2005, and assistant professor of electronics and computer communications, in Faculty of Electronic Engineering, Menoufia University, Egypt, 1999-2000. Elmedany was the research and development director of Evara R&D, Egypt, 2001-2003, and general director of Varia IC, Egypt, 2003-2005. He is the founder and managing editor of International Journal of Computing and Digital Systems (IJCDS). He is the founder and organizer of MobiApps, DPNoC, and WoTBD workshops and symposium series. He is also an editor of many journals special issues, member of editorial boards for many international journals, and member of technical program committees of many conferences. He is also reviewer in many international journals and conferences, and acts as chairperson in many conferences. El-Medany has over forty publications in a well-known international conferences and journals, and attended several national and international conferences and workshops. His research interests in ASIC design, FPGA, embedded systems, network on chip, remote monitoring systems, and reconfigurable computing.
Software Visualization Approach for Performance Measurement of Object-Oriented Code based on Cyber-Physical Systems (CPS) Software

Bo Kyung Park¹, Geun-Hee Kang², R. Young Chul Kim³*

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Abstract

The Cyber-Physical System (CPS) is autonomously performed by a number of heterogeneous systems combined over the network. CPS integrates large-scale systems, and each system controls independently. This is a typical distributed information system structure. So, CPS can control complex and large data of the real world. However, in this environment, CPS requires a variety of functions and high performance. CPS SW has a huge source code and a high complexity. Therefore, SW based on CPS does not guarantee performance or quality. To solve these problems, this paper proposes a performance measurement mechanism for the CPS-based Java code. This method can identify which part has a problem.

Keywords: CPS; SW Performance; Code Visualization; Refactoring.

1. Introduction

Cyber-Physical Systems (CPS) is an essential technology for the fourth industrial revolution such as smart factory and smart home [1]. CPS is acquiring, processing, computing, and analyzing physical world information. This result applies to the physical world through the actuator system. In other words, CPS is an extended concept of the existing embedded system. These embedded systems often have limited resources such as available power, memory, and performance. In this case, the embedded system can cause many operational problems. These embedded systems require various functions and high performance. For this reason, software becomes more complex and large source code. As a result, SW based on CPS does not guarantee performance or quality. To solve this problem, this paper proposes a performance measurement mechanism for Java code based on CPS. The procedure is as follows: We extract information from the source code to identify the internal structure of the CPS SW code. We define a module to represent the internal structure. We measure the coupling indicators of SW. Define performance degradation factor patterns. We measure the quantitative value of SW performance through profilers. Finally, we identify and improve the
problem with the software. We expect to improve the performance and quality of CPS SW. The composition of this paper is as follows: Chapter 2 introduces the related study. Chapter 3 describes the performance measurement mechanism of SW code (java) based on CPS. Chapter 4 shows case studies. Chapter 5 refers to conclusions and future studies.

2. Related Works

Code visualization visualizes the internal structure of the source code. Code visualization improves software quality based on coupling and cohesion [2]. It constructs tool-chains using several open-source tools. Tool-chain consists of a source navigator, SQLite, and view composer (Graphviz). Source Navigator is a parser that analyzes the source code. SQLite saves the analyzed data. View Composer generates an image of the analyzed data.

3. Performance Measurement Mechanism for CPS-based Java Codes

Figure 1 shows a performance measurement mechanism for cps based java code. This mechanism added tool-chain, rulechecker (PMD), Profiler (Hprop) [3], and HprofDataExtractor. Tool-Chain applied the existing code visualization method [2, 4]. RuleChecker extracts bad patterns of software performance [5]. The Profiler dynamically analyzes the CPS SW. The HprofDataExtractor refined the data from the Profiler into XML data.

4. Case Study

We applied some of the robot control and simulation programs (Couplic_sample project). Figure 2 is the detailed class view with performance indicators. The class name is displayed at the bottom of the figure (SampleDataClass). The Detailed Class View is divided into before and after clusters. Each cluster represents the method name, execution frequency, and execution time in the class. The arrows connect the methods of each cluster. The arrow value is the changed execution time. For example, there are a getB method of before and a getB method of after. The value between these methods is -2347.4297 (ms). This value indicates that the speed has improved since the refactoring.
5. Conclusion

In this paper, we propose a performance measurement mechanism for the high quality of CPS SW. We extracted the coupling and performance degradation elements through code visualization. Coupling increases the reusability of the CPS SW. Performance degradation is a factor that violates SW performance. We also performed dynamic analysis through the Java performance measurement tool (HProf). This can extract information on the execution speed of the method and the execution frequency of the method, and cannot be obtained from the static analysis. We could see the change of sw performance through the improvement of coupling. The change value of software performance is as follows: The speed 0.59%↑, 53.26%↑, 73.25%↓, 4.98%↓. Performance is improved when the stamp or external coupling is improved. Therefore, we recommend refactoring. Through code visualization, many developers and stakeholders can easily understand the software's quality indicators and structure. In the future, we will find out the performance impairment factors proposed in this paper and the dependent performance problems of each code.

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References