



IMCOM 2022, January 3 - 5
Seoul, Korea
Conference Program



| Hosted by |

Sungkyunkwan University, Korea
Universiti Kuala Lumpur, Malaysia



초대의 글

IEEE 학술대회로 성균관대가 후원하며 말레이시아 UniKL과 공동 주관하는 제 16회 International Conference on Ubiquitous Information Management and Communication (IMCOM)이 2022년 1월 3일(월)부터 5일(수)까지 온라인으로 개최됩니다. 미래사회에서는 인간, 컴퓨터, 사물 간의 상호작용을 위한 새로운 패러다임의 생성, 라이프로그의 활용, 컴패니언 디바이스의 역할, 특성, 맞춤 등 그에 따른 변화를 요구합니다. IMCOM 2022에서는 컴패니언 IoT의 시대를 준비하며 새로운 패러다임에 기여하는 학술 교류 및 전문 지식의 전파를 위해서 세계 최고 수준의 전문가들을 모시고 과기부/IITP G-ITRC의 틀 안에서 심도 있는 토론의 장을 마련하고자 합니다.

IMCOM 2022는 SCOPUS와 EI에 등재되어 있어 국제학술대회로서의 높은 권위를 유지하고 있습니다. 금년에는 20개국 이상의 나라에서 참여하였으며, 국내논문 24편, 외국논문 81여편정도가 최종 선정되었고, 수준 높은 학술 교류를 위해 여섯 분의 기조강연자를 모셨습니다. Machine Learning and Pattern Recognition, Video Coding의 전문가이신 홍콩대 Sam Kwong 교수님, AI대학원의 학과장 및 연구소장, Hyundai-Kia Motor Chair Professor을 맡고 계신 고려대학교 이성환 교수님, 수술 및 우주탐사 로봇의 Teleoperation에 전문가이시며 NASA Jet Propulsion Lab의 Technical Staff 이신 이탈리아 베로나 대학의 Paolo Fiorini 교수님, Metadata system for Information, Privacy Protection and Data Valuation의 전문가 이신 일본 교토대 Masatoshi Yoshikawa 교수님, Visual Servoing, Multi-sensor-based control, autonomous guided vehicles의 전문가이신 프랑스 Inria Center at Côte d'Azur 대학의 Philippe Martinet 교수님, 그리고 Embedded and Pervasive Computer Center의 국장이자 중국 상하이 자오통 대학의 Minyi Guo교수님을 초청하였습니다. 열띤 토론과 학술정보의 교환은 물론 폭넓은 친교를 통해 성대한 만남의 장과 성공적인 학술회의가 이루어질 수 있도록 부디 적극 참석하셔서 본 학술회의를 더욱 빛내 주시길 부탁드립니다.

대한민국 성균관대에서 2006년 기획되어 2007년부터 시작된 작은 학술회의가 이제 매년 200편 이상의 논문이 제출되고 서로 아끼며 주목하는 세계수준의 학술회의로 자리 잡았습니다. 많은 분들께서 노력해 주심으로 인해 미국과 유럽 중심의 저명한 국제학술회의와 어깨를 견줄 정도로 발전하고 있음에 진심으로 감사드립니다. 모두의 노력과 희생이 헛되지 않도록 아시아-태평양 지역에서 더욱 성실하게 성장하는 학술회의가 되도록 운영진 모두가 최선의 노력을 다하겠습니다.

여러분의 가정에 항상 평화가 있으시길 기원합니다.

성균관대 정보통신대학장 정민영
소프트웨어대학장 이은석
UniKL MITT Zalizah Awang Long
프로그램위원장 김 동 수
Takatoshi Ushiana
Syed M. Raza

IMCOM 2022 학회장 이 석 한
Lajos Hanzo
Roslan Ismail

운영위원장 추 현 승

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Message from General Co-Chairs

On behalf of the organizing committee, we welcome you to Seoul, Korea for the 16th International Conference on Ubiquitous Information Management and Communication (IMCOM 2022). We are very fortunate and honored to have renowned people of their respective fields gathering getting involved in the process of submitting papers, chairing sessions, reviewing papers, and organizing the conference.

Over the years IMCOM has evolved into a distinguished conference in Asia Pacific region. Behind this success, is the hardship of many committee members who have devoted their precious time to promote and advertise IMCOM pole to pole. The conference is an amalgam of high-quality submissions brought forward by thorough research to meet the high standard required, as of in today's world.

On the occasion of 16th conference of the IMCOM series, we proudly present you with terrific technical and social programs. Three days of technical programs are carefully designed to cover encyclopedic diversity, inspiration and technicality. Your active participation in the sessions will be awarded with timely messages and valuable future insight from not only the six high-profile keynote speakers but also other authors.

Again, we would like to express our sincere gratitude to the committee members' and referees' contributions in this event. Our special thanks are due to Prof. Roslan Ismail and Ms. Kim De Silva: the Malaysian Conference Organizers, Profs. Dongsoo S. Kim, Taketoshi Ushiyama, and Syed M. Raza: the Program Committee Co-Chairs, Prof. Samratul Janin Sidal: the Local Arrangement Co-Chairs, Profs. Hyunseung Choo, Hyounghick Kim, and Duc-Tai Le: the Treasurer and Operation Co-Chairs, and all other Chairs. Last but not least, we appreciate the support from international and domestic partnerships for this event, that is, the partnerships between Sungkyunkwan University, Korea, and Universiti Kuala Lumpur, Malaysia.

We wish your participation in IMCOM 2022 being a memorable one with valuable technical exchanges.

Sukhan Lee
Lajos Hanzo
Roslan Ismail
General Co-Chairs
IMCOM 2022



Sukhan Lee
Sungkyunkwan University
Korea



Lajos Hanzo
University of Southampton
United Kingdom



Roslan Ismail
Universiti Kuala Lumpur
Malaysia

Message from Program Co-Chairs

Welcome to the 16th International Conference on Ubiquitous Information Management and Communication (IMCOM) 2022, the second virtual IMCOM due to ongoing pandemic. It is tremendous to see the great leaps of technology in last two decades making this virtual conference a possibility.

IMCOM 2022 aims to provide a platform for promoting new visionary approaches and interdisciplinary researches. New evolving technology and futuristic ideas in the areas of information management, interaction management, communication technologies and their implications for social interaction, lays the firm foundation of the conference. The conference has served as a vital platform for researchers to exchange innovative ideas and significant research achievements; and provides a unique opportunity in which both technology and social science meet. Two main tracks for information processing management and communication will be held, covering both research and application works of information management, intelligent information processing, interaction management, networking /telecommunications, and social interaction.

This year's conference contains 6 outstanding speeches from distinguished keynote speakers, 12 regular sessions, 6 short-oral sessions, and 3 lightning sessions. This year we received 267 submissions from many countries and institutions around the world, resulting in a very competitive and rigorous review process. The program committee has dropped several good papers to deliver a very strong and pivotal conference program. Total 105 papers are accepted based on significance of contribution, relevance to the conference scope, and review scores (39.3% acceptance rate). All the accepted papers not only consist of novel ideas, new results, work in progress, and state-of-the-art techniques, but also provide us with the directions and stimulation for future research activities in the area of information management and communication technologies.

We are grateful to all the authors, reviewers, and members of the program committee for their remarkable efforts and contributions. Without their most valued help and cooperation, the tedious task of submission handling and paper reviewing could not have been successfully accomplished. We also praise the valiant effort by session chairs who accepted our request to virtually manage sessions of the conference, which is a new experience for many of us.

We thank the General Co-Chairs, Sukhan Lee, Lajos Hanzo, and Roslan Ismail for their great support and help. We also thank everyone who has contributed to the program – the authors, the reviewers, the program committee members and other organizing committee members for their splendid work.

We wish you to have a productive and enjoyable experience of this virtual conference and hope that next year we can personally meet again.



Dongsoo S. Kim
Indiana University
USA



Taketoshi Ushiyama
Kyushu University
Japan



Syed M. Raza
Sungkyunkwan University
Korea

Dongsoo S. Kim
Taketoshi Ushiyama
Syed M. Raza
Program Co-Chairs
IMCOM 2022

Organizing and Program Committees

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Seong-Moo Yoo *University of Alabama in Huntsville, USA*
Jiangsheng Yu *Peking University, China*

Program at a Glance

| January 03, 2022 (Monday) |

	Virtual Room 1	Virtual Room 2
09:00-09:45	Session 1: Big Data Analytics	Session 2: Recommendation and Ranking Systems
09:45-09:55	Opening Remarks	
09:55-10:40	Keynote Speech 1: Prof. Sam Kwong (Virtual Room 1)	
10:40-10:50	Break	
10:50-11:35	Keynote Speech 2: Prof. Seong-Whan Lee (Virtual Room 1)	
11:35-11:45	Break + Photo session (Turn on your cameras and lets take a photo together)	
11:45-12:30	Session 3: Human Body Imaging	Session 4: Towards User Comforts
12:30-12:35	Break	
12:35-13:10	Short Presentation Session 1: Data Manipulation and Searching	Short Presentation Session 2: Ethological Analytics
13:10-14:00	Lightning Session 1: Social Interactions and Forecasting	

Program at a Glance

| January 04, 2022 (Tuesday) |

	Virtual Room 1	Virtual Room 2
09:15-09:45	Keynote Speech 3: Prof. Paolo Fiorini (Virtual Room 1)	
09:45-09:55	Break	
09:55-10:40	Keynote Speech 4: Prof. Masatoshi Yoshikawa (Virtual Room 1)	
10:40-10:50	Break + Photo session (Turn on your cameras and lets take a photo together)	
10:50-11:35	Session 5: Sequential Data Learning	Session 6: Pandemic
11:35-11:45	Break	
11:45-12:30	Session 7: Deep Cognition	Session 8: Advanced Learnings
12:30-12:35	Break	
12:35-13:10	Short Presentation Session 3: Vision Computing	Short Presentation Session 4: Optimization
13:10-14:00	Lightning Session 2: Data · Analysis · Learning	

Program at a Glance

| January 05, 2022 (Wednesday) |

	Virtual Room 1	Virtual Room 2
09:15-09:45	Keynote Speech 5: Prof. Philippe Martinet (Virtual Room 1)	
09:45-09:55	Break	
09:55-10:40	Keynote Speech 6: Prof. Minyi Guo (Virtual Room 1)	
10:40-10:50	Break + Photo session (Turn on your cameras and lets take a photo together)	
10:50-11:35	Session 9: Telecommunication	Session 10: Online Education
11:35-11:45	Break	
11:45-12:30	Session 11: Peerless Connectivity	Session 12: Intelligent Intrusion Identification
12:30-12:35	Break	
12:35-13:10	Short Presentation Session 5: Reliable Internet of Things	Short Presentation Session 6: Wireless Communication
13:10-14:00	Lightning Session 3: Internet of Things Applications and Management	

Keynote Speakers

Monday, January 03, 2022, 9:55-10:40 (KST)



Prof. Sam Kwong

Chair Professor

Department of Computer Science, City University of Hong Kong, China

Associate Editor

IEEE Transactions on Industrial Informatic

IEEE Transactions on Industrial Electronics

IEEE Transactions on Evolutionary Computation

Journal of Information Science

Research Interests

Video Coding, Evolutionary Computation, Machine Learning and Pattern Recognition

Enhancing Video Coding by Data-driven Techniques and Advanced Models

In June 6th 2016, Cisco released a White paper, VNI Forecast and Methodology 2015-2020, reported that 82 percent of Internet traffic will come from video applications such as video surveillance, content delivery network, so on by 2020. It also reported that Internet video surveillance traffic nearly doubled, Virtual reality traffic quadrupled, TV grew 50 percent and similar increases for other applications in 2015. The annual global traffic will first time exceed the zettabyte (ZB; 1000 exabytes[EB]) threshold in 2016, and will reach 2.3 ZB by 2020. It implies that 1.886ZB belongs to video data. Thus, in order to relieve the burden on video storage, streaming and other video services, researchers from the video community have developed a series of video coding standards. Among them, the most up-to-date is the Versatile Video Coding (VVC), which has successfully halved the coding bits of its predecessors, without significant increase in perceived distortion. With the rapid growth of network transmission capacity, enjoying high definition video applications anytime and anywhere with mobile display terminals will be a desirable feature in the near future. Given the significant advances in multimedia and communication technologies, numerous video applications, such as video streaming and video conference, have been brought into the industry and occupy the primary Internet traffic. Performing stable and high-quality streaming services in constrained scenarios is challenging as they are sensitive to the time delay and bandwidth fluctuation. Owing to the increasing demand for high online visual quality, several dynamic adaptive streaming techniques have been proposed to provide low-latency and high-quality video services. As the ultimate consumer of the video stream is the end-user, the perceptual characteristics should be fully considered in video transmission. However, most of the existing algorithms do not consider video rate and transmission control with subjective factors, resulting in quality fluctuation and unnecessary bandwidth waste, which has led to emerging research on the rate control and transmission optimization for dynamic adaptive streaming. In this talk, I will present the most recent research results on machine learning and game theory based video coding. This is very different from the traditional approaches in video coding. We hope applying these intelligent techniques to video coding could allow us to go further and have more choices in trading off between cost and resources. We will present a perceptual-based rate control optimization in high efficiency video coding (HEVC) and the design of perceptual-based dynamic adaptive video transmission optimization to focus on the two major problems in video streaming which aims to achieve a balance between visual quality, quality, and buffer smoothness under the constraints.

Sam Kwong received the B.Sc. degree from the State University of New York at Buffalo, Buffalo, NY, in 1983, the M.A.Sc. degree in electrical engineering from the University of Waterloo, Waterloo, ON, Canada, in 1985, and the Ph.D. degree from the FernUniversität Hagen, Hagen, Germany, in 1996. From 1985 to 1987, he was a Diagnostic Engineer with Control Data Canada, where he designed the diagnostic software to detect the manufacture faults of the VLSI chips in the Cyber 430 machine. He later joined the Bell Northern Research Canada as a Member of Scientific Staff, where he worked on both the DMS-100 voice network and the DPN-100 data network project. In 1990, he joined the City University of Hong Kong as a Lecturer in the Department of Electronic Engineering. He is currently a Chair Professor in the Department of Computer Science. He coauthored three research books on genetic algorithms, eight book chapters, and over 200 technical papers. He has been a consultant to several companies in telecommunications. Currently, he is the Associate Editor for the Transactions on Industrial Informatic, the IEEE Transactions on Industrial Electronics, IEEE Transactions on Evolutionary Computation, the Journal of Information Science. Prof. Kwong was elevated to IEEE fellow for his contributions on Optimization Techniques for Cybernetics and Video coding in 2014. He is currently the President Elect of IEEE Systems, Man and Cybernetics from January 2021.

Keynote Speakers



Tuesday, January 04, 2022, 10:50-11:35 (KST)

Prof. Seong-Whan Lee

Hyundai-Kia Motor Chair Professor

Department of Brain and Cognitive Engineering, Korea University, South Korea

Research Interests

Medical Signal Processing, Electroencephalography, Brain-computer Interfaces, Signal Classification, Neurophysiology, Feature Extraction, Convolutional Neural Nets, Biomechanics Learning

Brain-to-Speech: Speech Synthesis from Neural Signals of Imagined Speech

Brain-computer interface (BCI) is a technology that enables communication with external devices by converting brain signals into computer commands. This technology, converged with artificial intelligence, is considered as a core technology to lead the fourth industrial revolution. Brain-to-speech refers to a brain signal-mediated communication system that converts brain activities of imagined speech into audible speech. Current BCI speller systems have shown promising results, however, the concept of brain-to-speech has attracted attention as an intuitive BCI communication method because it directly connects neural activity to the means of human linguistic communication. It has considerable potential to explore new fields of intuitive brain decoding which may greatly enhance the naturalness of communication using brain signals. With the current discoveries on neural features of imagined speech and the development of the speech synthesis technologies, direct translation of brain signals into speech has shown significant promise. This talk introduces the current brain-to-speech technology with the possibility of speech synthesis from non-invasive brain signals, which may ultimately facilitate silent communication through brain signals.

Seong-Whan Lee is the Hyundai-Kia Motor Chair Professor at Korea University, where he is the head of the Department of Artificial Intelligence and the director of the Institute of Artificial Intelligence at Korea University. He received the B.S. degree in computer science and statistics from Seoul National University, Seoul, Korea, in 1984, and the M.S. and Ph.D. degrees in computer science from Korea Advanced Institute of Science and Technology in 1986 and 1989, respectively. From February 1989 to February 1995, he was an Assistant Professor in the Department of Computer Science at Chungbuk National University, Cheongju, Korea. In March 1995, he joined the faculty of the Department of Computer Science and Engineering at Korea University, Seoul, Korea, and now he is the tenured full professor. In 2001, he stayed at the Department of Brain and Cognitive Sciences, MIT as a visiting professor. A Fellow of the IAPR (1998), IEEE (2010), and the Korean Academy of Science and Technology (2009), he has served several professional societies as chairman or governing board member. He was the founding Editor-in-Chief of the International Journal of Document Analysis and Recognition and has been an Associate Editor of several international journals: Pattern Recognition, ACM Trans. on Applied Perception, IEEE Trans. on Affective Computing, Image and Vision Computing, International Journal of Pattern Recognition and Artificial Intelligence, and International Journal of Image and Graphics. He was the founding president of the Korean Society for Artificial Intelligence. His research interests include pattern recognition, artificial intelligence, and brain engineering. He has more than 540 publications in international journals and conference proceedings, and authored 10 books.

Keynote Speakers



Tuesday, January 04, 2022, 09:15-09:45 (KST)

Prof. Paolo Fiorini

Professor

Department of Computer Science, University of Verona, Italy

Member

Technical Staff at NASA Jet Propulsion Laboratory, California Institute of Technology, US

Honorary Professor

Obuda University, Italy

Research Interests

Cyber Physical Systems, Integration of Computing, Control and Communication, Applied Computing, System Modeling and Control, Robotics, Man-Machine Interfaces.

Robotic systems for autonomous surgery

Robotic systems are increasingly used in surgical procedures and, in particular, in minimally-invasive surgeries to improve quality and procedure consistency. Current surgical robots are teleoperated devices, whose only automation capabilities are in image processing and tremor suppression. Since many surgical actions are repetitive, surgical procedures could benefit from some degree of autonomy in which specific tasks are carried out by the robot. Research in autonomous robots is advancing and many commercial surgical robot systems could soon embed semi-autonomous feature. An additional motivation of automation in surgery is to compensate for human errors, since safety in complex surgical robots highly depends on the information flow among all the involved agents. After reviewing the state of the art in autonomy for robot-assisted surgery, this talk will discuss the meaning of autonomy, which is used to indicate different functions. To achieve an autonomous behavior, artificial intelligence algorithms must be embodied into a robotic host and many challenges have to be solved to achieve the necessary cognitive and manual skills. Tasks required from an autonomous surgical robot include decision making, environment understanding, action planning and successful execution. This talk will summarize the results achieved by the robotics group at the University of Verona in developing new methods for knowledge representation, task planning, motion control learning, and situation awareness. The novel algorithms have been integrated into our laboratory set-up based on the da Vinci Research Kit (dVRK) and demonstrated in examples of surgical actions and training tasks.

Paolo Fiorini received the Laurea degree in Electronic Engineering from the University of Padova, (Italy), the MSEE from the University of California at Irvine (USA), and the Ph.D. in ME from UCLA (USA). From 1985 to 2000, he was with NASA Jet Propulsion Laboratory, California Institute of Technology, where he worked on autonomous and teleoperated systems for space experiments and exploration. In 2001 returned to Italy at the School of Science of the University of Verona (Italy) where is a Full Professor of Computer Science. His research focuses on teleoperation for surgery, space, service and exploration robotics, and autonomous navigation of robots and vehicles. In 2001 he founded the ALTAIR robotics laboratory, which has been awarded several EU and Italian grants, including projects on robotic surgery, such as Accurobas, Safros, Isur, and Eurosurge. In 2009, he founded the company Surgica Robotica for the development of a new surgical robot for abdominal surgery that received the CE certification in 2012. He is an IEEE Fellow (USA, 2009), Corresponding Member of the Academy of Agriculture, Sciences and Letters (Verona, 2015), and Honorary Professor of Obuda University (Budapest, 2016).

Keynote Speakers



Monday, January 03, 2022, 09:55-10:40 (KST)

Prof. Masatoshi Yoshikawa

Professor

Graduate School of Informatics, Kyoto University, Japan

Steering Committee Member

International Conference on Big Data and Smart Computing

IEEE Technical Committee on Data Engineering

Research Interests

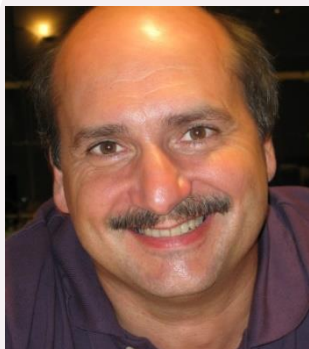
Privacy Protection and Data Valuation, Metadata Systems for Information on Earth Environment

Utilization of Privacy-Protected Personal Data

Our daily lives would not be possible without the services that we enjoy in exchange for providing personal data, such as search engines, Web advertisements, and restaurant searches. Personal data, is useful resources for our society. The construction of data ecosystems that maximize the utility of individuals and society as a whole while keeping privacy of personal data under their control is an important issue for the future of society. In this talk, we introduce technologies for utilizing privacy-protected personal data and their applications. The talk also covers basic concepts on personal data market where individuals can sell their personal data and receive appropriate compensation for their potential privacy loss.

Masatoshi Yoshikawa received B.E., M.E. and Ph.D. degrees from Department of Information Science, Kyoto University in 1980, 1982 and 1985, respectively. He was on the faculty of Kyoto Sangyo University from 1985 until 1993. From 1989 to 1990, he was a visiting scientist at Computer Science Department, University of Southern California. In 1993, he joined Nara Institute of Science and Technology (NAIST) as a faculty member. From April 1996 to January 1997, he has stayed at Department of Computer Science, University of Waterloo as a visiting associate professor. From June 2002 to March 2006, he served as a professor at Nagoya University. From April 2006, he has been a professor at Kyoto University.

Keynote Speakers



Wednesday, January 05, 2022, 09:15-09:45 (KST)

Prof. Philippe Martinet

Research Director

Inria Center at Côte d'Azur University, France

Research Interests

Robotics; Visual Servoing; Vision; Parallel Robot; Humanoid

Proactive Autonomous Navigation in Human Populated Environment

Autonomous navigation in human populated environment is difficult as it is facing the freezing robot problem where generally reactive techniques fail. With a certain level of density, there is no solution if we do not take into account the future evolution of the environment over a time horizon. There are different aspects to consider in this global problem. Human (or simply pedestrian with or without an electrical mobility devices) behaviors require to be observed or learnt in order to predict their evolution. An accurate and realistic model of such agent is necessary. In that area, recent advances have been done in by enhancing the classical Social Force Model. The second aspect concerns the observation as human represents an Hidden dimension and the question is what is necessary and can be observed? The third aspect deals with the control in order to monitor the action of the robot. The question is: what is the best action to do taking into account the knowledge we have and the observation we do in order to join a particular place in the human populated environment? During the presentation, I will present the recent advances that we have done in different research projects.

Philippe Martinet graduated from the CUST, Clermont- Ferrand, France, in 1985 and received the Ph.D. degree in electronics science from the Blaise Pascal University, France, in 1987. From 1990 to 2000, he was assistant Professor with CUST. From 2000 until 2011, he has been a Professor with Institut Français de Mécanique Avancée (IFMA), Clermont-Ferrand. In 2006, he was a visiting professor at the Sungkyunkwan university in Suwon, South Korea. In September 2011, he moves to Ecole Centrale de Nantes and LS2N. In November 2017, he moves to Inria Sophia Antipolis as Research director. His research interests include visual servoing of robots, multi-sensor-based control, force vision coupling, autonomous guided vehicles, modeling, identification and control of complex machines. From 1990, he is Author and Coauthor of around four hundred references.

Keynote Speakers



Wednesday, January 05, 2022, 09:55-10:40 (KST)

Prof. Minyi Guo

Head

Department of Computer Science and Engineering, Shanghai Jiao Tong University, China

Director

Embedded and Pervasive Computing Center

Research Interests

Parallel and Distributed Processing; Parallelizing Compilers; Cloud Computing; Pervasive Computing; Software Engineering, Embedded Systems; Green Computing; Wireless Sensor Networks.

Cloud Computing for Sprinting Peak Services

Many internet applications have the characteristics of "sprinting peak load", that is the requests could be significantly increased thousand times in adjacent time unit. For example, Wechat red packet on new year's eve, and Alibaba "Double Eleven" shopping carnival of e-commerce platforms are such kind of applications. To support these internet services the traditional cloud systems could not satisfy the requirements due to lack of many efficient special means. In this talk, aim at such applications, the principal faultiness are designated for traditional cloud systems first. Then we try to improve in request latency, storage throughout capacity, container expansion speed, and fault-tolerance, to satisfy sprinting peak load service requirements. The system we developed has been applied in many real sprinting peak load scenarios.

Minyi Guo received the BSc and ME degrees in computer science from Nanjing University, China; and the PhD degree in computer science from the University of Tsukuba, Japan. He is currently a Chair professor of Shanghai Jiao Tong University (SJTU), China. Before joined SJTU, Dr. Guo had been a professor of the school of computer science and engineering, University of Aizu, Japan. Dr. Guo received the national science fund for distinguished young scholars from NSFC in 2007, and was supported by "Recruitment program of Global Experts" in 2010. His present research interests include parallel/distributed computing, compiler optimizations, big data and cloud computing. He has more than 400 publications in major journals and international conferences in these areas. He received 7 best/highlight paper awards from international conferences including ALSPOS 2017 and ICCD 2018. He is now Editor-in-Chief of IEEE Transactions on Sustainable Computing, and on the editorial board of IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Cloud Computing and Journal of Parallel and Distributed Computing. Dr. Guo is a fellow of IEEE, a fellow of CCF, and a distinguished member of ACM.

Conference Program

| 09:00-09:45, Monday, January 03, 2022 |

Session 1: Big Data Analytics

09:00-09:45, Monday, January 03, 2022

Room: Virtual Room 1

Session Chair: Duc-Tai Le

1-1	Utilization of Big Data with Cloud Computing in Modern Business Environment: A Review Mohammed Adnan Islam (<i>Asia Pacific University of Technology and Innovation, Malaysia</i>), Muhammad Ehsan Rana (<i>Asia Pacific University of Technology and Innovation, Malaysia</i>)
1-2	A Framework for an IT-based risk management for the third-party funding process in universities (TRINITY) Matthias Baumgart (<i>University of Applied Sciences Mittweida, Germany</i>), Claudia Hösel (<i>University of Applied Sciences Mittweida, Germany</i>), Manuel Heinzig (<i>University of Applied Sciences Mittweida, Germany</i>), Matthias Vodel (<i>University of Applied Sciences Mittweida, Germany</i>), Christian Roschke (<i>University of Applied Sciences Mittweida, Germany</i>), Marc Ritter (<i>University of Applied Sciences Mittweida, Germany</i>)
1-3	Estimating Neutrality of News Articles and Reactions on Twitter Taketoshi Ushiyama (<i>Kyushu University, Japan</i>), Tenyu Kawaguchi (<i>Kyushu University, Japan</i>)

Session 2: Recommendation and Ranking Systems

09:00-09:45, Monday, January 03, 2022

Room: Virtual Room 2

Session Chair: Nguyen Tien Dung

2-1	Music recommendation service based on user impressions: Study of user interface acquiring appropriate impression words Yujia Han (<i>Ochanomizu University, Japan</i>), Miyuki Nakano (<i>Tsuda University, Japan</i>), Masato Oguchi (<i>Ochanomizu University, Japan</i>)
2-2	Hotel Recommendation based on Review Analysis by Considering Tourism Needs Yuanyuan Wang (<i>Yamaguchi University, Japan</i>)
2-3	An Efficient Algorithm for Ranking Candidates in E-Recruitment System Abdul Hanan Minhas (<i>National University of Computer and Emerging Sciences, Pakistan</i>), Mohammad Daniyal Shaiq (<i>National University of Computer and Emerging Sciences, Pakistan</i>), Saad Ali Qureshi (<i>National University of Computer and Emerging Sciences, Pakistan</i>), Musa Dildar Ahmed (<i>National University of Computer and Emerging Sciences, Pakistan</i>), Shujaat Hussain (<i>National University of Computer and Emerging Sciences, Pakistan</i>), Kifayat Ullah Khan (<i>National University of Computer and Emerging Sciences, Pakistan</i>)

Conference Program

| 11:45-12:30, Monday, January 03, 2022 |

Session 3: Human Body Imaging
11:45-12:30, Monday, January 03, 2022

Room: Virtual Room 1
Session Chair: Suriana Ismail

3-1	Accurate Non-Contact Body Temperature Measurement with Thermal Camera under Varying Environment Conditions
	Changhoon Song (<i>Sungkyunkwan University, South Korea</i>), Sukhan Lee (<i>Sungkyunkwan University, South Korea</i>)
3-2	Automatic Counting Red Blood Cells in the Microscopic Images by EndPoints Method and Circular Hough Transform
	Amir Aslan Aslani (<i>University of Tehran, Iran</i>), Mohammad Zolfaghari (<i>University of Tehran, Iran</i>), Hedieh Sajedi (<i>University of Tehran, Iran</i>)
3-3	Deep Representation for the Classification of Ultrasound Breast Tumors
	Mingue Song (<i>Towson University, United States</i>), Yanggon Kim (<i>Towson University, United States</i>)

Session 4: Towards User Comforts
11:45-12:30, Monday, January 03, 2022

Room: Virtual Room 2
Session Chair: Jang Hyun Kim

4-1	Older people's Online Information Search During the Pandemic
	Snehasish Banerjee (<i>University of York, United Kingdom</i>), Ariadne Beatrice Kapetanaki (<i>University of York, United Kingdom</i>), Lauren Dempsey (<i>University of York, United Kingdom</i>)
4-2	IoT based Indoor Senior Citizen Monitoring and Alerting System
	Kamalanathan Shanmugam (<i>Asia Pacific University of Technology & Innovation, Malaysia</i>), Muhammad Ehsan Rana (<i>Asia Pacific University of Technology & Innovation, Malaysia</i>), Grace Ong (<i>Asia Pacific University of Technology & Innovation, Malaysia</i>)
4-3	An Intelligent Gamification Tool to Boost Young Kids Cybersecurity Knowledge on FB Messenger
	Fatokun Faith B. (<i>University of Kuala Lumpur, Malaysia</i>), Zalilah Awang Long (<i>University of Kuala Lumpur, Malaysia</i>), Suraya Hamid (<i>University of Malaya, Malaysia</i>), Johnson Fatokun O (<i>Anchor University Lagos, Nigeria</i>), Christopher Ifeanyi Eke (<i>University of Malaya, Malaysia</i>), Azah Norman (<i>University of Malaya, Malaysia</i>)

Conference Program

| 12:35-13:10, Monday, January 03, 2022 |

Short Presentation Session 1: Data Manipulation and Searching 12:35-13:10, Monday, January 03, 2022		Room: Virtual Room 1 Session Chair: Suriana Ismail
	Relationship between Hashtags Usage and Reach Rate in Instagram	
S1-1	Seungjong Sun (<i>Sungkyunkwan University, South Korea</i>), Minwoo Kim (<i>Sungkyunkwan University, South Korea</i>), Dongyan Nan (<i>Sungkyunkwan University, South Korea</i>), Jang Hyun Kim (<i>Sungkyunkwan University, South Korea</i>)	
	A More Effective Book Search System Utilizing Colors Reflecting Reader Impressions	
S1-2	Shota Nakamura (<i>Hiroshima City University, Japan</i>), Tomoko Kajiyama (<i>Hiroshima City University, Japan</i>)	
	Mining Contextual Item Similarity without Concept Hierarchy	
S1-3	Md. Fahim Arefin (<i>University of Dhaka, Bangladesh</i>), Chowdhury Farhan Ahmed (<i>University of Dhaka, Bangladesh</i>), Redwan Ahmed Rizvee (<i>University of Dhaka, Bangladesh</i>), Carson K. Leung (<i>University of Manitoba, Canada</i>), Longbing Cao (<i>University of Technology Sydney, Australia</i>)	
	Data Cleaning of Sound Data with Label Noise Using Self Organizing Map	
S1-4	Pildong Hwang (<i>Towson University, United States</i>), Yanggon Kim (<i>Towson University, United States</i>)	
	Performance Centric Primary Storage Deduplication Systems Exploiting Caching and Block Similarity	
S1-5	Rakesh Gururaj (<i>San Jose State University, United States</i>), Melody Moh (<i>San Jose State University, United States</i>), Teng-Sheng Moh (<i>San Jose State University, United States</i>), Philip Shilane (<i>Dell Technologies, United States</i>), Bhimsen Bhanjois (<i>Dell Technologies, United States</i>)	

Conference Program

| 12:35-13:10, Monday, January 03, 2022 |

Short Presentation Session 2: Ethological Analytics 12:35-13:10, Monday, January 03, 2022

Room: Virtual Room 2
Session Chair: Taketoshi Ushima

	Studying Borderline Personality Disorder Using Machine Learning
S2-1	Koushik Deb (<i>Institute of Engineering and Management, India</i>), Hemangee De (<i>Institute of Engineering and Management, India</i>), Seshadri Sekhar Chatterjee (<i>Diamond Harbour Govt. Medical College and Hospital, India</i>), Anjan Pal (<i>Institute of Engineering and Management, India</i>)
	HELLO: An Android-based Mobile Application for Autism Individuals to Improve Socio-Communicational Learnability in Bangladesh
S2-2	Ishrat Jahan Yra (<i>East West University, Bangladesh</i>), Maksud Hossain Pranto (<i>East West University, Bangladesh</i>), Amit Kumar Das (<i>East West University, Bangladesh</i>)
	Exploring User Experience of "Animal Crossing" via Semantic Network Approach
S2-3	Dongyan Nan (<i>Sungkyunkwan University, South Korea</i>), Min Hyung Park (<i>Sungkyunkwan University, South Korea</i>), Woomin Nam (<i>Sungkyunkwan University, South Korea</i>), Yerin Kim (<i>Sungkyunkwan University, South Korea</i>), ShaoPeng Che (<i>Sungkyunkwan University, South Korea</i>), Jang Hyun Kim (<i>Sungkyunkwan University, South Korea</i>)
	Developing a Chatbot system using Deep Learning based for Universities consultancy
S2-4	Thuong Le-Tien (<i>HoChiMinh City University of Technology, Viet Nam</i>), Tai Nguyen-D-P (<i>HoChiMinh City University of Technology, Viet Nam</i>), Vy Huynh-Y (<i>HoChiMinh City University of Technology, Viet Nam</i>)
	Feature Reuse in CNN for Human Proteins Localization
S2-5	Mahmood Qolizadeh (<i>Tarbiat Modares University, Iran</i>), Mohammad Saniee Abadeh (<i>Tarbiat Modares University, Iran</i>)

Conference Program

| 13:10-14:00, Monday, January 03, 2022 |

Lightning Session 1: Social Interactions and Forecasting

13:10-14:00, Monday, January 03, 2022

	Geo-Fencing Technique for Internship Placement- Use Cases Deliverables
L1-1	Suriana Ismail (<i>Universiti Kuala Lumpur, Malaysia</i>), M.Aiman M.Hanafi (<i>Universiti Kuala Lumpur, Malaysia</i>), Roslan Ismail (<i>Universiti Kuala Lumpur, Malaysia</i>), Ahmad Shahrafidz Khalid (<i>Universiti Kuala Lumpur, Malaysia</i>), Faridah Sh Ismail (<i>Universiti Kuala Lumpur, Malaysia</i>)
	A Conceptual Framework for an Integrated Healthcare Information Systems from an Organizational Perspective
L1-2	Abdulaziz Aborujiah (<i>University of Kuala Lumpur, Malaysia</i>), Abubaker-Eseddig Fath Mahmoud Elsebaie (<i>University of Kuala Lumpur, Malaysia</i>), Shamsul Anuar Mokhtar (<i>University of Kuala Lumpur, Malaysia</i>), Zalizah Awang Long (<i>University of Kuala Lumpur, Malaysia</i>), Shafiza Mohd Shariff (<i>University of Kuala Lumpur, Malaysia</i>), Nur Syahela Hussien (<i>University of Kuala Lumpur, Malaysia</i>), Mohd Nizam Husen (<i>University of Kuala Lumpur, Malaysia</i>)
	Multiclass Imbalanced Handling using ADASYN Oversampling and Stacking Algorithm
L1-3	Yoga Pristyanto (<i>Universitas Amikom Yogyakarta, Indonesia</i>), Anggit Ferdita Nugraha (<i>Universitas Amikom Yogyakarta, Indonesia</i>), Akhmad Dahlan (<i>Universitas Amikom Yogyakarta, Indonesia</i>), Lucky Adhikrisna Wirasakti (<i>Universitas Amikom Yogyakarta, Indonesia</i>), Aditya Ahmad Zein (<i>Universitas Amikom Yogyakarta, Indonesia</i>), Irfan Pratama (<i>Universitas Mercu Buana Yogyakarta, Indonesia</i>)
	Artificial Intelligence an Influential Review: Pandemic Scenario
L1-4	Ritu Chauhan (<i>Amity University, India</i>), Aparajita Sengupta (<i>Amity University, India</i>), Eiad Yafi (<i>Institute of Business, Australia</i>)
	Brand Post Popularity on Social Media: A Systematic Literature Review
L1-5	Sebastian Robson (<i>Bettys & Taylors of Harrogate, United Kingdom</i>), Snehashish Banerjee (<i>University of York, United Kingdom</i>), Avneet Kaur (<i>University of York, United Kingdom</i>)
	Real-time Scale and Rotation Invariant Multiple Template Matching
L1-6	Jung Rok Kim (<i>Sungkyunkwan, Korea</i>), Jae Wook Jeon (<i>Sungkyunkwan, Korea</i>)
	Descriptive Analysis of Built-in Security Features in Web Development Frameworks
L1-7	Jibril Adamu (<i>Universiti Kuala Lumpur, Malaysia</i>), Abdulaziz Aborujilah (<i>Universiti Kuala Lumpur, Malaysia</i>), Shafiza Mohd Shariff (<i>Universiti Kuala Lumpur, Malaysia</i>), Zalizah Awang Long (<i>University of Kuala Lumpur, Malaysia</i>)

Conference Program

| 13:10-14:00, Monday, January 03, 2022 |

Lightning Session 1: Social Interactions and Forecasting

13:10-14:00, Monday, January 03, 2022

	Steel Defect Classification Using Machine Learning
L1-8	Syeda Rabia Arshad (<i>National University of Science and Technology, Pakistan</i>), Ishwa Obaid (<i>National University of Science and Technology, Pakistan</i>), Rameesha Gull (<i>National University of Science and Technology, Pakistan</i>), Muhammad Khurram Shahzad (<i>National University of Science and Technology, Pakistan</i>)
	Intelligent Water Level Prediction Model for small-and medium-sized rivers Based on Small Sample Data
L1-9	Qingqing Chen (<i>Hohai University, China</i>), Dingsheng Wan (<i>Hohai University, China</i>), Yufeng Yu (<i>Hohai University, China</i>), Ke Li (<i>Yellow River Conservancy Commission, China</i>)
	Monocular Intra-vehicular Distance Estimation using Front Vehicle License Plate
L1-10	Yu Rong (<i>Sungkyunkwan University, South Korea</i>), Jinglong Jiang (<i>Sungkyunkwan University, South Korea</i>), Husna Mutahira (<i>Sungkyunkwan University, South Korea</i>), Mannan Saeed Muhammad (<i>Sungkyunkwan University, South Korea</i>)
	Timber Harvesting Residual Trees Damage Decision-Making for Sustainable Forest Management
L1-11	Hana Munira Muhd Mukhtar (<i>Universiti Kuala Lumpur, Malaysia</i>), Yasmin Yahya (<i>Universiti Kuala Lumpur, Malaysia</i>), Azizah Rahmat (<i>Universiti Kuala Lumpur, Malaysia</i>), Roslan Ismail (<i>Universiti Kuala Lumpur, Malaysia</i>)
	Towards AI based Ophthalmological Screening through Ultra-widefield Fundus Image Enhancement to Conventional Fundus Image Translation
L1-12	Pham Van Nguyen (<i>Sungkyunkwan University, Korea</i>), Duc-Tai Le (<i>Sungkyunkwan University, Korea</i>), Hyunseung Choo (<i>Sungkyunkwan University, Korea</i>)

Conference Program

| 10:50-11:35, Tuesday, January 04, 2022 |

Session 5: Sequential Data Learning 10:50-11:35, Tuesday, January 04, 2022

Room: Virtual Room 1
Session Chair: Tran Khanh Dang

	Improving a Graph-to-Tree Model for Solving Math Word Problems
5-1	Hyunju Kim (<i>Sungkyunkwan University, Korea</i>), Junwon Hwang (<i>Sungkyunkwan University, Korea</i>), Taewoo Yoo (<i>Sungkyunkwan University, Korea</i>), Yun-Gyung Cheong (<i>Sungkyunkwan University, Korea</i>)
	Resume Parsing Framework for E-recruitment
5-2	Hira Sajid (<i>National University of Computer and Emerging Sciences, Pakistan</i>), Javeria Kanwal (<i>National University of Computer and Emerging Sciences, Pakistan</i>), Saeed Ur Rehman Bhatti (<i>National University of Computer and Emerging Sciences, Pakistan</i>), Saad Ali Qureshi (<i>National University of Computer and Emerging Sciences, Pakistan</i>), Amna Basharat (<i>National University of Computer and Emerging Sciences, Pakistan</i>), Shujaat Hussain (<i>National University of Computer and Emerging Sciences, Pakistan</i>), Kifayat Ullah Khan (<i>National University of Computer and Emerging Sciences, Pakistan</i>)
	Explicit and Implicit Section Identification from Clinical Discharge Summaries
5-3	Asim Abbas (<i>Kyung Hee University, Korea</i>), Jamil Hussain (<i>Sejong University, Korea</i>), Muhammad Afzal (<i>Sejong University, Korea</i>), Hafiz Syed Muhammad Bilal (<i>National University of Science and Technology, Pakistan</i>), Sungyoung Lee (<i>Kyung Hee University, Korea</i>), Seokhee Jeon (<i>Kyung Hee University, Korea</i>)

Session 6: Pandemic 10:50-11:35, Tuesday, January 04, 2022

Room: Virtual Room 2
Session Chair: Jongpil Jeong

	Analysis of COVID-19 Using Imaging and Audio Modalities
6-1	Omar Alaaeldin (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Omar Sayed El Ahl (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Lamiaa Elmahy (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Martin Ihab (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Walid Gomaa (<i>Egypt-Japan University of Science and Technology, Egypt</i>)
	Mining the Impacts of COVID-19 Pandemic on Labor Market
6-2	Joshua F. Smallwood (<i>University of Manitoba, Canada</i>), Chenru Zhao (<i>University of Manitoba, Canada</i>), Carson K. Leung (<i>University of Manitoba, Canada</i>), Yan Wen (<i>University of Manitoba, Canada</i>), Hao Zheng (<i>University of Manitoba, Canada</i>)
	Cybercriminals Strike Where It Hurts Most: SARS-Cov-2 Pandemic and its Influence on Critical Infrastructure Ransomware Attacks
6-3	Gatha Varma (<i>Amity University, India</i>), Ritu Chauhan (<i>Amity University, India</i>)

Conference Program

| 11:45-12:30, Tuesday, January 04, 2022 |

Session 7: Deep Cognition

11:45-12:30, Tuesday, January 04, 2022

Room: Virtual Room 1

Session Chair: Jongpil Jeong

	An Approach to Improving Anomaly Detection Using Multiple Detectors
7-1	Paaras Chand (<i>San Jose State University, United States</i>), Melody Moh (<i>San Jose State University, United States</i>), Teng-Sheng Moh (<i>San Jose State University, United States</i>)
	Face Photo-Sketch Recognition Using Bidirectional Collaborative Synthesis Network
7-2	Seho Bae (<i>Sungkyunkwan University, Korea</i>), Nizam Ud Din (<i>Sungkyunkwan University, Korea</i>), Hyunkyu Park (<i>Sungkyunkwan University, Korea</i>), Juneo Yi (<i>Sungkyunkwan University, Korea</i>)
	Significance of Syntactic Type Identification in Embedding Vector based Schema Matching
7-3	Fahad Ahmed Satti (<i>Kyung Hee University, Korea</i>), Musarrat Hussain (<i>Kyung Hee University, Korea</i>), Sungyoung Lee (<i>Kyung Hee University, Korea</i>), TaeChoong Chung (<i>Kyung Hee University, Korea</i>)

Session 8: Advanced Learnings

11:45-12:30, Tuesday, January 04, 2022

Room: Virtual Room 2

Session Chair: Jae-pil Heo

	A Method to Generate Posed Person Image with few Context Images
8-1	Hidemoto Nakada (<i>Artificial Intelligence Research Center, Japan</i>), Hideki Asoh (<i>Artificial Intelligence Research Center, Japan</i>)
	Few Shot Model based on Weight Imprinting with Multiple Projection Head
8-2	Paulino Cristovao (<i>University of Tsukuba, Japan</i>), Hidemoto Nakada (<i>National Institute of Advanced Industrial Science and Technology, Japan</i>), Yusuke Tanimura (<i>National Institute of Advanced Industrial Science and Technology, Japan</i>), Hideki Asoh (<i>National Institute of Advanced Industrial Science and Technology, Japan</i>)
	Alpha Lightweight Coreset for k-Means Clustering
8-3	Nguyen Le Hoang (<i>HCMC University of Technology, Vietnam</i>), Tran Khanh Dang (<i>HCMC University of Technology, Vietnam</i>)

Conference Program

| 12:35-13:10, Tuesday, January 04, 2022 |

Short Presentation Session 3: Vision Computing 12:35-13:10, Tuesday, January 04, 2022		Room: Virtual Room 1 Session Chair: Syed M. Raza
	Predict joint angle of body parts based on sequence pattern recognition	
S3-1	Amin Ahmadi Kasani (<i>University of Tehran, Iran</i>), Hedieh Sajedi (<i>University of Tehran, Iran</i>),	
	Sorting of Scrambled Video Frames Using Temporal Order Verification	
S3-2	Mazen Khodier (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Ahmed Abdelaziz (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Maria Gadelkarim (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Abdelrahman Abdelkhalek (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Walid Gomaa (<i>Egypt-Japan University of Science and Technology, Egypt</i>)	
	Bangla Handwritten Character and Digit Recognition Using Deep Convolutional Neural Network on Augmented Dataset and Its Applications	
S3-3	Hasibul Huda (<i>East West University, Bangladesh</i>), Md. Ariful Islam Fahad (<i>East West University, Bangladesh</i>), Moonmoon Islam (<i>East West University, Bangladesh</i>), Amit Kumar Das (<i>East West University, Bangladesh</i>)	
	Hybrid Neural Networks for Electroencephalography Motor Imaging Classification	
S3-4	Nhan Trinh (<i>University of Information Technology VNU-HCM, Vietnam</i>), Duc M. Duong (<i>University of Information Technology VNU-HCM, Vietnam</i>), Binh Tran (<i>University of Information Technology VNU-HCM, Vietnam</i>), Hoai Su (<i>University of Information Technology VNU-HCM, Vietnam</i>)	
	Multiple Frame Integration for Essential Matrix-based Visual Odometry	
S3-5	Huu-Hung Nguyen (<i>Le Quy Don Technical University, Vietnam</i>), Xuan-Phuc Nguyen (<i>Le Quy Don Technical University, Vietnam</i>), Cong-Manh Tran (<i>Le Quy Don Technical University, Vietnam</i>), Huu-Hung Nguyen (<i>Le Quy Don Technical University, Vietnam</i>), Quang-Thi Nguyen (<i>Le Quy Don Technical University, Vietnam</i>)	

Conference Program

| 12:35-13:10, Tuesday, January 04, 2022 |

Short Presentation Session 4: Optimization 12:35-13:10, Tuesday, January 04, 2022

Room: Virtual Room 2
Session Chair: Tran Khanh Dang

S4-1	Online-Tuning of Speed and Position Controllers using Particle Swarm Optimization Algorithm for a BLDC Motor Hoang Ngoc Tran (Sungkyunkwan University, Korea), Ty Trung Nguyen (Sungkyunkwan University, Korea), Ton Hoang Nguyen (Sungkyunkwan University, Korea), Bac Viet Nguyen (Sungkyunkwan University, Korea), Hung Quang Cao (Sungkyunkwan University, Korea), Jae Wook Jeon (Sungkyunkwan University, Korea)
S4-2	Feature-Wise Ranking of Candidates through Maximum Degrees in Hidden Bipartite Graphs Sarah Kiyani (National University of Computer and Emerging Sciences, Pakistan), Musa Dildar Ahmed Cheema (National University of Computer and Emerging Sciences, Pakistan), Saad Ali Qureshi (National University of Computer and Emerging Sciences, Pakistan), Shujaat Hussain (National University of Computer and Emerging Sciences, Pakistan), Kifayat Ullah Kha (National University of Computer and Emerging Sciences, Pakistan)
S4-3	An Efficient Multi-Criteria Path Selection Approach in Road Networks through Influencer Nodes and K-hop Search Zeeshan Ali (National University of Computer and Emerging Sciences, Pakistan), Waqas Nawaz (Islamic University of Madina, Saudi Arabia), Kifayat Ullah Khan (National University of Computer and Emerging Sciences, Pakistan)
S4-4	An Improved Sliding Mode Control Using Reduced-order PI Observer for PMSM system Ton Hoang Nguyen (Sungkyunkwan University, Korea), Ty Trung Nguyen (Sungkyunkwan University, Korea), Hoang Ngoc Tran (Sungkyunkwan University, Korea), Jae Wook Jeon (Sungkyunkwan University, Korea)
S4-5	Studying Offloading Optimization for Energy–Latency Tradeoff With Collaborative Edge Computing Pranathi Padidem (Kennesaw State University, United States), Ahyoung Lee (Sungkyunkwan University, United States)

Conference Program

| 13:10-14:00, Tuesday, January 04, 2022 |

Lightning Session 2: Data Analysis Learning

13:10-14:00, Tuesday, January 04, 2022

L2-1	Automatic Forecasting of Volcanoes Eruption Time
	Abdulrahman Hussien Mustafa (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Farah Mahmoud AbdelMoneim (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Magy Gamal Matta (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Toka Ossama Barghash (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Walid Gomaa (<i>Egypt-Japan University of Science and Technology, Egypt</i>)
L2-2	Medical Image Segmentation for Skin Lesion Detection via Topological Data Analysis
	Niloofar Jazayeri (<i>University of Tehran, Iran</i>), Farnaz Jazayeri (<i>Sharif University of Technology, Iran</i>), Hedieh Sajedi (<i>University of Tehran, Iran</i>)
L2-3	A Study of Split Learning Model
	Jihyeon Ryu (<i>Sungkyunkwan University, Korea</i>), Dongho Won (<i>Sungkyunkwan University, Korea</i>), Youngsook Lee (<i>Howon University, Korea</i>)
L2-4	RECP from the Perspective of Chinese Mainlanders and Taiwanese Netizens : A Comparative Semantic Network analysis
	ShaoPeng Che (<i>Sungkyunkwan University, Korea</i>), Pim Kamphuis (<i>Sungkyunkwan University, Korea</i>), Shunan Zhang (<i>Sungkyunkwan University, Korea</i>), Jang Hyun Kim (<i>Sungkyunkwan University, Korea</i>)
L2-5	Probec: A Product Hunting Tool
	Hibbah Nadeem (<i>Bahria University, Pakistan</i>), Rukhma Tassadaq (<i>Bahria University, Pakistan</i>), Mobeen Nazar (<i>Universiti Kuala Lumpur, Malaysia</i>), Ahsan Mustafa (<i>Bahria University, Pakistan</i>)
L2-6	Analysis and Forecast of the COVID-19 Spreading Curve for the Resumption of In-person Classes
	Huaze Xie (<i>Kyoto Sangyo University, Japan</i>), Da Li (<i>Kyoto Sangyo University, Japan</i>), Yuanyuan Wang (<i>Yamaguchi University, Japan</i>), Yukiko Kawai (<i>Kyoto Sangyo University, Japan</i>)
L2-7	Self-studying environment with imagery rehearsal for a ball-carrier in basketball
	Kenji Matsuura (<i>Tokushima University, Japan</i>), Hiroki Tanioka (<i>Tokushima University, Japan</i>), Naka Gotoda (<i>Kawaga University, Japan</i>), Tomohito Wada (<i>National Institute of Fitness and Sports in Kanoya, Japan</i>)

Conference Program

| 13:10-14:00, Tuesday, January 04, 2022 |

Lightning Session 2: Data.Analysis.Learning 13:10-14:00, Tuesday, January 04, 2022

	VaIS: A Leading Visual and Inertial Dataset of Squats
L2-8	Ahmed Fayez (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Ahmed Sharshar (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Ahmed Hesham (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Islam Eldifrawi (<i>Egypt-Japan University of Science and Technology, Egypt</i>), Walid Gomaa (<i>Egypt-Japan University of Science and Technology, Egypt</i>)
	A Comparative Investigation on the Use of Cloud Computing for Big Data Analytics
L2-9	Wei Chun Lew (<i>Asia Pacific University of Technology and Innovation, Malaysia</i>), Muhammad Ehsan Rana (<i>Asia Pacific University of Technology and Innovation, Malaysia</i>), Vazeerudeen Abdul Hameed (<i>Asia Pacific University of Technology and Innovation, Malaysia</i>)
	Abstractive Summarization of Korean Legal Cases using Pre-trained Language Models
L2-10	Jiyoung Yoon (<i>Sungkyunkwan University, Korea</i>), Muhammad Junaid (<i>Sungkyunkwan University, Korea</i>), Sajid Ali (<i>Sungkyunkwan University, Korea</i>), Jongwuk Lee (<i>Sungkyunkwan University, Korea</i>)
	A Multi-task based Bilateral-Branch Network for Imbalanced Citation Intent Classification
L2-11	Tianxiang Hu (<i>Hangzhou Dianzi University, China</i>), Jiyi Li (<i>University of Yamanashi, Japan</i>), Fumiyo Fukumoto (<i>University of Yamanashi, Japan</i>), Renjie Zhou (<i>Hangzhou Dianzi University, China</i>)
	Resu-mizer: Hybrid Resume Information Retrieval System
L2-12	Saeed Ur Rehman Bhatti (<i>National University of Computer & Emerging Sciences, Pakistan</i>), Mohammad Daniyal Shaiq (<i>National University of Computer & Emerging Sciences, Pakistan</i>), Hira Sajid (<i>National University of Computer & Emerging Sciences, Pakistan</i>), Saad Ali Qureshi (<i>National University of Computer & Emerging Sciences, Pakistan</i>), Shujaat Hussain (<i>National University of Computer & Emerging Sciences, Pakistan</i>), Kifayat Ullah Khan (<i>National University of Computer & Emerging Sciences, Pakistan</i>)
	Multi-modal Fundus Image Registration with Deep Feature Matching and Image Scaling
L2-13	Juchan Kim (<i>Sungkyunkwan University, Korea</i>), Duc-Tai Le (<i>Sungkyunkwan University, Korea</i>), Changhwan Son (<i>Kunsan National University, Korea</i>), Hyunseung Choo (<i>Sungkyunkwan University, Korea</i>)

Conference Program

| 10:50-11:35, Wednesday, January 05, 2022 |

Session 9: Telecommunication

10:50-11:35, Wednesday, January 05, 2022

Room: Virtual Room 1

Session Chair: Xiaofeng Gao

9-1	Optimizing baseline in USBL using Costas hopping to increase navigation precision in shallow water
	Hoang Bach Nhat (<i>Academy of Science and Technology, Vietnam</i>), Lang Vu Hai (<i>Academy of Science and Technology, Vietnam</i>), Giang Tran Quang (<i>Academy of Science and Technology, Vietnam</i>), Duc Nguyen Van (<i>Hanoi University of Science and Technology, Vietnam</i>), Ha Vu Le (<i>Academy of Science and Technology, Vietnam</i>), Trung Trinh Xuan (<i>Academy of Science and Technology, Vietnam</i>)
9-2	An Investigation of The 5G LDPC and Polar Decoding Performance in Spatial Correlated MIMO-OFDMA System
	Nguyen Thu Nga (<i>Hanoi University of Science and Technology, Vietnam</i>), Chu Huu Khanh (<i>Hanoi University of Science and Technology, Vietnam</i>), Nguyen Quy Tho (<i>Hanoi University of Science and Technology, Vietnam</i>)
9-3	Comparative Performance Analysis of Code-Domain NOMA and Power-Domain NOMA
	Ayesha Jehan (<i>National University of Sciences and Technology, Pakistan</i>), Muhammad Zeeshan (<i>National University of Sciences and Technology, Pakistan</i>)

Session 10: Online Education

10:50-11:35, Wednesday, January 05, 2022

Room: Virtual Room 2

Session Chair: Nguyen Tien Dung

10-1	Knowledge Creation in Online Environment: Bridge between Self and Collaborative Studies
	Toyohide Watanabe (<i>Nagoya Industrial Science Research Institute, Japan</i>)
10-2	Using Feed-forward Backprop, Perceptron, and Self-organizing Algorithms to Predict Students' Online Behavior
	Ha Thi The Nguyen (<i>Chaoyang University of Technology, Taiwan</i>), Ling-Hsiu Chen (<i>Chaoyang University of Technology, Taiwan</i>), Vani Suthamathi (<i>Chaoyang University of Technology, Taiwan</i>)
10-3	The Development of the Massive Open Online Course on Distance Forms of Research and Training
	Sergey Kratov (<i>ICMMG SB RAS, Russia</i>), Alexey Podsadnikov (<i>NSPU, Russia</i>)

Conference Program

| 11:45-12:30, Wednesday, January 05, 2022 |

Session 11: Peerless Connectivity

11:45-12:30, Wednesday, January 05, 2022

Room: Virtual Room 1

Session Chair: Masato Oguchi

	Collection Tree for Wireless Coverage Problem in Mobile Crowdsensing
11-1	Dejun Kong (<i>Shanghai Jiao Tong University, China</i>), Xiaofeng Gao (<i>Shanghai Jiao Tong University, China</i>), Guihai Chen (<i>Shanghai Jiao Tong University, China</i>)
	Network Probabilistic Connectivity: Optimal Structures II
11-2	Alexey Rodionov (<i>Institute of Computational Mathematics and Mathematical Geophysics SB RAS, Russia</i>)
	Implementation and Performance Analysis of Time-Determined Forwarding and Queuing Functions Based on IEEE 802.1Qav
11-3	Young Soo Do (<i>Sungkyunkwan University, Korea</i>), Min Ho Kim (<i>Sungkyunkwan University, Korea</i>), Jae Wook Jeon (<i>Sungkyunkwan University, Korea</i>)

Session 12: Intelligent Intrusion Identification

11:45-12:30, Wednesday, January 05, 2022

Room: Virtual Room 2

Session Chair: Syed M. Raza

	Designing Ensemble Deep Learning Intrusion Detection System for DDoS attacks in Software Defined Networks
12-1	Uakomba Mbasuva (<i>Namibia University of Science and Technology, Namibia</i>), Guy-Alain Lusilao Zodi (<i>Namibia University of Science and Technology, Namibia</i>)
	Classification of IoT based DDoS Attack using Machine Learning Techniques
12-2	Muhammad Fasih, Ashfaq (<i>National University of Sciences and Technology, Pakistan</i>), Maryam, Malik (<i>National University of Sciences and Technology, Pakistan</i>), Urooj, Fatima (<i>National University of Sciences and Technology, Pakistan</i>), Muhammad Khuram Shahzad (<i>National University of Sciences and Technology, Pakistan</i>)
	Machine Learning for Multi-Classification of Botnets Attacks
12-3	Thanh Cong Tran (<i>Ho Chi Minh University of Economics and Finance, Vietnam</i>), Tran Khanh Dang (<i>HCMC University of Technology, Vietnam</i>)

Conference Program

| 12:35-13:10, Wednesday, January 05, 2022 |

Short Presentation Session 5: Reliable Internet of Things 12:35-13:10, Wednesday, January 05, 2022		Room: Virtual Room 1 Session Chair: Syed M. Raza
S5-1	A Novel Approach for UAV-Aided Vehicle-to-Everything Networks	
	Tran Anh Kiet (<i>The University of Danang, Vietnam</i>), Nguyen Thi Le Quyen (<i>The University of Danang University of Science and Technology, Vietnam</i>), Ho Phan Hieu (<i>The University of Danang, Vietnam</i>), Vo Trung Hung (<i>The University of Danang University of Technology and Education, Vietnam</i>)	
S5-2	On Reliability of Pipeline Monitoring Sensor Networks	
	Vladimir Shakhov (<i>Novosibirsk State Technical University, Russia</i>), Anastasia Yurgenson (<i>Novosibirsk State Technical University, Russia</i>), Honglong Chen (<i>China University of Petroleum, China</i>)	
S5-3	A Novel Mutual Trust Evaluation Method for Identification of Trusted Devices in Smart Environment	
	Ubaid Ur Rehman (<i>Kyung Hee University, Korea</i>), Amir Ali (<i>Xian Jiaotong University, China</i>), Hafiz Syed Muhammad Bilal (<i>National University of Sciences and Technology, Pakistan</i>), Muhammad Asif Razzaq (<i>Iqra University, Pakistan</i>), Seong-Bae Park (<i>Kyung Hee University, Korea</i>), Sungyoung Lee (<i>Kyung Hee University, Korea</i>)	
S5-4	Urgency-differentiated Data Acquisition in Large UAV-integrated IoT Systems	
	Tien Pham Van (<i>Hanoi University of Science and Technology, Vietnam</i>), Chung Duc Nguyen Dang (<i>Hanoi University of Science and Technology, Vietnam</i>)	
S5-5	A General Model for Long-short Term Anomaly Generation in Sensory Data	
	Thien-Binh Dang (<i>Sungkyunkwan University, South Korea</i>), Duc-Tai Le (<i>Sungkyunkwan University, South Korea</i>), Moonseong Kim (<i>Seoul Theological University, South Korea</i>), Hyunseung Choo (<i>Sungkyunkwan University, South Korea</i>)	

Conference Program

| 12:35-13:10, Wednesday, January 05, 2022 |

Short Presentation Session 6: Wireless Communication 12:35-13:10, Wednesday, January 05, 2022

Room: Virtual Room 2
Session Chair: Xiaofeng Gao

S6-1	A Novel Integrated Model for Positioning Indoor MISO VLC Exploiting Non-Light-of-Sight Communication
	Dat Vuong (Vietnam-Korea University of Information and Communication Technology-University of Da Nang, Vietnam), TT Son (Vietnam-Korea University of Information and Communication Technology-University of Da Nang, Vietnam), DH Ai (Vietnam-Korea University of Information and Communication Technology-University of Da Nang, Vietnam), Trong-Hop Do (University of Information Technology VNU-HCM, Vietnam), CP Huynh (Vietnam-Korea University of Information and Communication Technology-University of Da Nang, Vietnam), Hung N.Tan (The University of Danang-University of Science and Technology, Vietnam), NVA Quang (Vietnam-Korea University of Information and Communication Technology-University of Da Nang, Vietnam), Tttvinh (Vietnam-Korea University of Information and Communication Technology-University of Da Nang, Vietnam)
S6-2	Underwater Searching based on AUV - ASV Cooperation
	Tien Pham Van (Hanoi University of Science and Technology, Vietnam), Chung Duc Nguyen Dang (Hanoi University of Science and Technology, Vietnam)
S6-3	RF Transceiver with Antenna Design for Ultrawideband and Automotive Applications
	Wen-Cheng Lai (National Yunlin Univ. of Science and Technology, Taiwan), Ren Jian (Shenyang University of Technology, China), Xin Xiaoning (Shenyang University of Technology, China)
S6-4	Wireless ECU reprogramming for multiple vehicles in factories and service centers via WiFi
	MinHo Kim (Sungkyunkwan University, Korea), YoungSoo Do (Sungkyunkwan University, Korea), JaeWook Jeon (Sungkyunkwan University, Korea)
S6-5	A gain boosted single stage wideband InP HBT amplifier for terahertz applications
	Waseem Abbas (Sungkyunkwan University, South Korea), Munkyo Seo (Sungkyunkwan University, South Korea)

Conference Program

| 13:10-14:00, Wednesday, January 05, 2022 |

Lightning Session 3: IoT Applications and Management 13:10-14:00, Wednesday, January 05, 2022	
L3-1	Smart Home Appliances Control System and Smart Wireless Charger for Electric Vehicles
	Mohamed Hassan Abdel Hamied (<i>Egyptian Electricity Transmission Company, Egypt</i>)
L3-2	RIS-based Energy and Data Transfer Protocol in IoT Networks
	Ji-Ho Park (<i>Sungkyunkwan University, South Korea</i>), Yijun Piao (<i>Sungkyunkwan University, South Korea</i>), Tae-Jin Lee (<i>Sungkyunkwan University, South Korea</i>)
L3-3	Comparisons of Reconstruction Capabilities for Lossy Transmission with Block-Based Compressed Sensing
	Yuh-Yih Lu (<i>Minghsin University of Science and Technology, Taiwan, R.O.C</i>), Feng-Cheng Chang (<i>Tamkang University, Taiwan, R.O.C</i>), Hsiang-Cheh Huang (<i>National University of Kaohsiung, Taiwan, R.O.C</i>), Po-Liang Chen (<i>National University of Kaohsiung, Taiwan, R.O.C</i>)
L3-4	UAVs Handover Decision using Deep Reinforcement Learning
	Younghoon Jang (<i>Sungkyunkwan University, Korea</i>), Syed M. Raza (<i>Sungkyunkwan University, Korea</i>), Hyunseung Choo (<i>Sungkyunkwan University, Korea</i>), Moonseong Kim (<i>Sungkyunkwan University, Korea</i>)
L3-5	CyberSaver – A Machine Learning Approach to Detection of Cyber Bullying
	Hii Lee Jia (<i>Asia Pacific University of Technology and Innovation, Malaysia</i>), Vazeerudeen Abdul Hameed (<i>Asia Pacific University of Technology and Innovation, Malaysia</i>), Muhammad Ehsan Rana (<i>Asia Pacific University of Technology and Innovation, Malaysia</i>),
L3-6	Person Identification Based on Accelerations on Drawing Figures with a Smartphone
	Yoshihaya Takahashi (<i>Kogakuin University Graduate School, Japan</i>), Atsuya Sonoyama (<i>Kogakuin University Graduate School, Japan</i>), Takeshi Kamiyamatou (<i>Nagasaki University, Japan</i>), Masato Oguchi (<i>Ochanomizu University, Japan</i>), Saneyasu Yamaguchi (<i>Kogakuin University, Japan</i>)
L3-7	A Preliminary Study of Cashless Payment Face Recognition System Development in Malaysia
	Sarerusaenye Ismail (<i>Universiti Tuanku Abdul Rahman, Malaysia</i>), Shahrinaz Ismail (<i>Albukhary International University, Malaysia</i>)

Conference Program

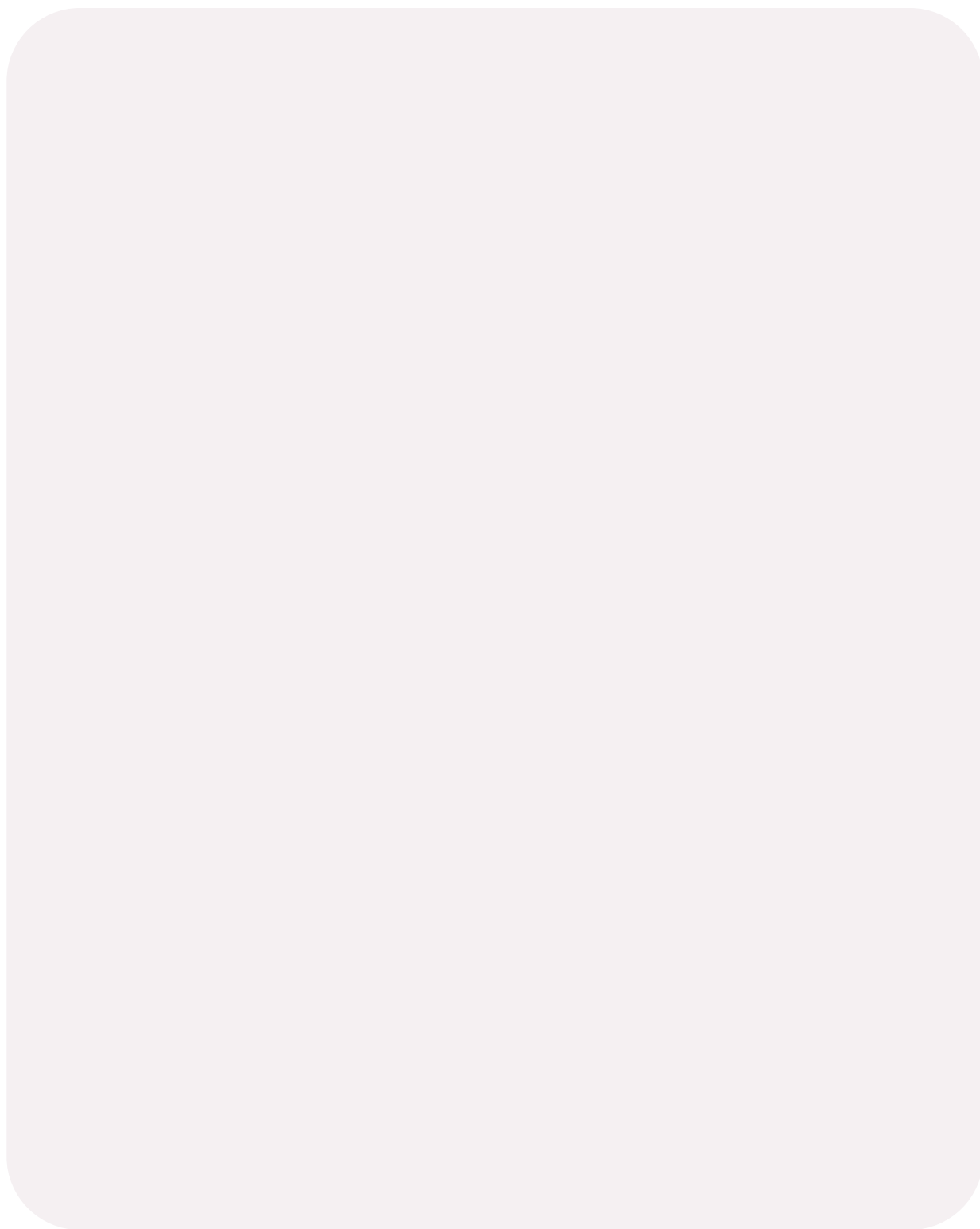
| 13:10-14:00, Wednesday, January 05, 2022 |

Lightning Session 3: IoT Applications and Management

13:10-14:00, Wednesday, January 05, 2022

L3-8	Identifying Counterfeit Products using Blockchain Technology in Supply Chain System
	Nafisa Anjum (<i>Chittagong University of Engineering and Technology, Bangladesh</i>), Pramit Dutta (<i>Chittagong University of Engineering and Technology, Bangladesh</i>)
L3-9	Implementation on Partially Verifiable Multi-signature Scheme in Electronic Contract Systems
	Dongwoo Kang (<i>Sungkyunkwan University, Korea</i>), Hoil Ryu (<i>Markany, Republic of Korea</i>), Dongho Won (<i>Sungkyunkwan University, Korea</i>)
L3-10	Biometrics as a method of employee control
	Justyna Żywiołek (<i>Czestochowa University of Technology, Poland</i>), Achyuth Sarkar (<i>National Institute of Technology Arunachal Pradesh India, India</i>), Muhammad Safdar Sial (<i>COMSATS University Islamabad, Pakistan</i>)
L3-11	A mobile game approach for energy conservation awareness
	Maslinda Mohd Nadzir (<i>Universiti Utara Malaysia, Malaysia</i>), Baktajivan Pillay (<i>Universiti Utara Malaysia, Malaysia</i>)
L3-12	The Product Development of Portable Laboratory Integrated with Local Wisdom (PL-ILW) by Undergraduate Student
	Rudi Susanto (<i>Duta Bangsa University, Indonesia</i>), Mohd Nizam Husen (<i>Universiti Kuala Lumpur, Malaysia</i>), Adidah Lajis (<i>Universiti Kuala Lumpur, Malaysia</i>)
L3-13	Power Minimization for Data Collection in UAV-Assisted IoT Wireless Sensor Networks
	Tran Anh Kiet (<i>The University of Danang, Vietnam</i>), Cao Xuan Tuan (<i>The University of Danang, Vietnam</i>), Ho Phan Hieu (<i>The University of Danang, Vietnam</i>), Nguyen Thi Le Quyen (<i>The University of Danang University of Science and Technology, Vietnam</i>), Dang Hoai Phuong (<i>The University of Danang University of Science and Technology, Vietnam</i>), Vo Trung Hung (<i>The University of Danang University of Technology and Education, Vietnam</i>),

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