

## The 7th IEEE/ACIS International Conference on Big Data, Cloud Computing, and Data Science Engineering (BCD 2022)



**August 4-6, 2022**  
**Vietnam - Korea University of Information and Communication Technology**  
**(VKU)**  
**Da Nang, Viet Nam**

**Sponsored by:**  
**International Association for Computer & Information Science (ACIS)**  
**URL: [www.acisinternational.org](http://www.acisinternational.org)**

**In cooperation with:**  
**Vietnam - Korea University of Information and Communication Technology (VKU)**  
**URL: <http://vku.udn.vn/>**

## **Conference Organizing Committee Members**

### **General Chair:**

Prof. Roger, Central Michigan University, USA,  
Prof. Gwangyong Gim, Soongsil University, Korea

### **Conference Chairs:**

Dr. Van Hung Trong, VKU, Viet Nam  
Prof. Jongwoo Park, Soongsil University, Korea

### **Program Chairs:**

Dr. Vo Thi Thanh Thao, VKU, Viet Nam  
Prof. Jongbae Kim, Soongsil University, Korea

### **Finance Chair:**

Prof. Donghyuk Cho, Soongsil University, Korea

### **Registration Chair:**

Dr. Donghyuk Cho, Soongsil University, Korea

### **Publicity Chairs:**

Dr. Van Hung Trong, VKU, Viet Nam  
Prof. Jongwoo Park, Soongsil University, Korea  
Dr. Vo Thi Thanh Thao, VKU, Viet Nam  
Prof. Jongbae Kim, Soongsil University, Korea

### **Local Arrangement Chair:**

Dr. Vo Thi Thanh Tho, VKU, Viet Nam

## Program at a Glance

Thursday, August 4, 2022

Time	8/4	
	Event	Location
9:00 ~ 17:00	Registration	
10:30 ~ 11:00	Opening Ceremony (BCD & EAIM)	VKU** Lobby
11:00 ~ 11:50	Keynote 1	VKU Room A
11:50 ~ 13:00	Lunch	
13:00 ~ 13:50	Keynote 2	VKU Room A
13:50 ~ 14:00	Break	
14:00 ~ 16:20	BCD Session 1 BCD Session 2	VKU Room A VKU Room B
16:20 ~ 16:30	Break	
16:30 ~ 18:50	BCD Session 1 BCD Session 2	VKU Room A VKU Room B
19:00 ~ 21:00	Welcome Reception (BCD & EAIM)	Muong Thanh Grand Da Nang Hotel*

**\* Muong Thanh Grand Da Nang Hotel:**

962 Ngo Quyen, An Hai Tay, Son Tra, Da Nang city

**\*\* VKU (Vietnam - Korea University of Information and Communication Technology):**

470 Tran Dai Nghia, Hoa Hai, Ngu Hanh Son, Da Nang city

## Program at a Glance

Friday, August 5, 2022

Time	8/5	
	Event	Location
9:00 – 17:00	Registration	
10:00 ~ 11:50	BCD Session 1 BCD Session 2 BCD Session 3	VKU Room A VKU Room B VKU Room C
11:50 ~ 13:00	Lunch	
13:00 ~ 14:50	BCD Session 1 BCD Session 2 BCD Session 3	VKU Room A VKU Room B VKU Room C
14:50 ~ 15:00	Break	
15:00 ~ 16:50	BCD Session 3 BCD Session 4	VKU Room C VKU Room D
16:50 ~ 17:00	Break	
17:00 ~ 18:00	BCD Session 3 BCD Session 4	VKU Room C VKU Room D
19:00 ~ 21:00	Award Presentation Dinner Banquet (BCD & EAIM)	

**\*\* VKU (Vietnam - Korea University of Information and Communication Technology):**  
470 Tran Dai Nghia, Hoa Hai, Ngu Hanh Son, Da Nang city

## Program at a Glance

Saturday, August 6, 2022

Time	8/6	
	Event	Location
9:00 ~ 12:00	Registration	
10:00 ~ 11:50	BCD Session 3 BCD Session 4	VKU Room C VKU Room D
11:50 ~ 13:00	Lunch	
13:00 ~ 14:50	BCD Session 4	VKU Room D
14:50 ~ 15:00	Break	
15:00 ~ 17:00	BCD Session 4	VKU Room D
17:00 ~ 17:30	Break	
17:30 ~ 18:30	Closing Ceremony	VKU Room D

**\*\* VKU (Vietnam - Korea University of Information and Communication Technology):**  
470 Tran Dai Nghia, Hoa Hai, Ngu Hanh Son, Da Nang city

## Keynote 1

# Temporal Aspects in Big Data

Jixin Ma

Professor of Computer Science

University of Greenwich, U.K. j.ma@gre.ac.uk

### Abstract

Scenario recognition is an important technology in Data Science and Artificial Intelligence. It reveals historical patterns, trends and associations related to human behavior and time by computing and analyzing large-scale data sets. Scenario recognition can be used to solve the problems of prediction, decision-making, diagnosis, process management and supervision, historical reconstruction and so on. However, accurate representing and matching scene patterns in big data is a complex problem. This talk will introduce some basic concepts with respects to time, fluent, state and scenario, and related theories and application examples, as well as a framework for scene pattern representation and matching. The framework can effectively represent relative and absolute time knowledge, and solve the calculation problem of temporal similarity by transforming time similarity into graph similarity. As a special case, we will demonstrate how to apply the framework to represent the traffic light control problem of human intersection in time series and state series.

### Bio

Dr Jixin Ma is a Full Professor in the School of Computing and Mathematical Sciences, University of Greenwich, U.K. He is the Director of the Centre for Computer and Computational Science, and the Director of School's PhD/MPhil Programme. He is also a Visiting Professor of Beijing Normal University, Auhui University, Zhengzhou Light Industrial University, and City University of Macau. Professor Ma obtained his BSc and MSc of Mathematics in 1982 and 1988, respectively, and PhD of Computer Sciences in 1994. His main research areas include Data Science, Artificial Intelligence and Information Systems, with special interests in Temporal Logic, Temporal Databases, Reasoning about Action and Change, Case-Based Reasoning, Pattern Recognition, Graph Matching and Information Security. He has been a member of British Computer Society, American Association of Artificial Intelligence, ICIS/IEEE, and Special Group of Artificial Intelligence of BCS. Professor Ma has been the Editor of several international journals and international conference proceedings, and Program Chair/Invited Keynote Speakers of many international conferences. He has published more than 150 research papers in international journals and conferences

## Keynote 2

# Practical Cyber-Physical Systems in Industry 4.0 and Society 5.0

Tokuro Matsuo, Ph.D.

Professor, Advanced Institute of Industrial Technology, Japan

tokuro@tokuro.net

### Abstract

Nowadays, a lot of types of communication system to make consensus among people are provided. We can utilize these kinds of systems, such as Social network system, e-mail, and instant messenger system, to make a decision and determination through online discussion. In the next decade, we can forecast a lot of types of consensus formation systems are provided and we may find new communication systems integrating between cyber and physical environment. In this talk, I introduce our conducted experiments using cyber-physical discussion environment in the panel discussion session in the conference. In the session, facilitator asks question to panelists about issues on the discussion and attendees can also do as well by their voice. Each attendee also can post and declare his/her opinions and suggestions through the online discussion system during the session. One or two facilitators facilitate the discussion in the online system as well as real discussion. We found out a lot of interesting results of attendees survey taken in before/after the experiments. I also introduce the environment to provide useful information for attendees by the digital signage system in the conference venue. This digital signage system is connected to the attendees location capture system and conference registration system. These integrations between cyber and physical environments and data enable to make better consensus formation between all sorts of people.

### Bio

Dr. Tokuro Matsuo is currently a Full Professor (tenured) at Advanced Institute of Industrial Technology (AIIT) in Public University Corporation Tokyo Metropolitan University from 2012. Also, he is currently a Director of Research Center for Artificial Intelligence and Service Science at AIIT; CEO of International Institute of Applied Informatics (IIAI); a Guest Professor at Bina Nusantara University, Indonesia; a Guest Professor at Nagoya Institute of Technology, Japan; an Adjunct Professor at Asian University, Taiwan; and Japan Conference Ambassador. He was an Associate Professor (tenured) at Yamagata University, Japan (2006-2012); an Invited Professor at City University of Macau, Macau (2018-2020); a Visiting Professor at University of Nevada, Las Vegas, USA (2016-2017); a Vice-President, International Association for Computer and Information Science, USA (2015-2017); a Vice-President, Software Engineering Research Foundation, USA (2013-2018); a Visiting Researcher at University of California at Irvine, USA (2010-2011); a Research Fellow at Shanghai University, China (2010-2013); and a Project Professor of Green Computing Research Center at Nagoya Institute of Technology, Japan (2011-2014); and a Research Fellow of SEITI in Central Michigan University, USA (2010-2018). He received my Ph.D. in computer science from Nagoya Institute of Technology in 2006. His current research interests include agent-based electronic commerce, qualitative reasoning and simulation, material informatics, IT and business management, and IoT.

# Program in Detail

Thursday, August 4, 2022

**9:00 - 17:00: Registration**

**10:30 - 11:00: Opening Ceremony**

**VKU Lobby**

**11:00 - 11:50: Keynote 1**

**VKU Room A**

**11:50 - 13:00: Lunch**

**13:00 - 13:50: Keynote 2**

**VKU Room A**

**13:50 - 14:00: Break**

**14:00 - 16:20: BCD Session 1**

**VKU Room A**

## ***Digital Services & Management / Business Intelligence***

**Session Chair: Dr. Jong-Bae Kim**

What drives customers' intention towards two-sided platforms in Vietnam? - A case study of ride-hailing services  
*Thao Vo Thi Thanh and Trong Van Hung*

Factors Impacting the Intention to Use Role-playing Games in Learning Communicative English of University Students in Da Nang City  
*Pha Vo Truong An, Phu Ta Xuan and Trong Van Hung*

A conceptual framework for determining metaverse adoption in IT enterprises in Vietnam  
*Trong Van Hung, Thin Nguyen Si, Thi Quynh Anh Vu, Thi Kieu Trang Nguyen and Thao Vo Thi Thanh*

A Study on Factors Determining Public Acceptance of Telemedicine in Malaysia's Private Healthcare System  
*Rohaini Ramli and Hasniza Yahya*

Modeling Customer Satisfaction based on Kano Model from Online Reviews\_Focused on deep learning natural language processing  
*Myeongseok Oh, Taeyeon Kim, and Euntack Im*

A Study on Big Data Utilization Intention of Small and Medium-sized Manufacturing Companies  
*Kyongjin Jeong, Dong Cheol Kim, and Kyunghyun Lee*

A Study on the Factors Affecting Customer Satisfaction in Delivery Applications: Focusing on Sentiment Analysis of Review Data  
*Seunguk Lee, Jaeyoung SoWeonsun Choi*

**14:00 - 16:20: BCD Session 2**

**VKU Room B**

## ***Information Systems / Application / Computational Science***

**Session Chair: Dr. Jong Woo Park**

Research on Multi-feature Fusion Topic Detection in the Financial Field  
*Hang Ji and Jiakun Zhao*

Study on Cobots' Arms for Color, Shape, and Size Detection  
*Muhammad Baballe Ahmad and Mukhtar Ibrahim Bello*

Analysis of workloads for Cloud services  
*Lakshmi Sankaran, Saleema Janardhanan Subramanian and Basem Suleiman*

VIRTUAL REALITY BASED ON 3-D CHATBOT  
*Animesh Kumar Tiwari and Anish Anand*

Exploring the Application of Machine Learning Algorithms to Water Quality Analysis  
*Jeong Yang*

Modeling short-term solar energy generation: an integrated approach  
*Eric K.H. Leung and Mark C. P. Poo*



A Study on the Possibility of Prediction of the ESG Ranking used by ESG News Keyword  
*Jaeyoung So, Myungho Lee, Jihun Park, and Gwangyong Gim*

**16:20 - 16:30: Break**

**16:30 - 18:50: BCD Session 1**

**VKU Room A**

***Digital Services & Management / Business Intelligence***

**Session Chair: Dr. Jong-Bae Kim**

An Empirical Study on the Economic Factors Affecting on the Export of Defense Industry  
*Taeyeon Kim, Dong Cheol Kim, Jaehwan Kwon, and Gwangyong Gim*  
A Study on the Intention to Use New Innovative Financial Services  
*Byeongryun Jeon, Kilsang Yoo, and Taeyeon Kim*

Analysis of the Predictive Power of highway Traffic flow with weather conditions  
*MinJi Kang, Hyeon-ju Park, Chungku Han, and Gwangyong Gim*

A Study on Electricity Consumption Prediction in LSTM and ARIMA Model  
*Hyeon-ju Park, Chungku Han, Kilsang Yoo, and Gwangyong Gim*

A Study on the Continuous Usage Intention of Artificial Intelligence Speaker in Product Service System Perspective  
*Sunghwan Yoon, Younghoon Kim, and Myungho Lee*

Automated ML and Python ML Performance Comparison Study  
*Euntack Im, Jina Lee, Sung byeong An, and Gwangyong Gim*

A Study on the Factors Affecting the Intention to Adopt of Blockchain-Based Identity Certification Services in the Defense Sector  
*Kyungjin Lee, Hyeonju Park, and Minwoo Lee*

**16:30 - 18:50: BCD Session 2**

**VKU Room B**

***Information Systems / Application / Computational Science***

**Session Chair: Dr. Jong Woo Park**

Air Pollution prediction study using deep Learning  
*Chungku Han, Hyeonju Park, Youngsoo Kim, and Gwangyong Gim*  
A Study on Predicting Employee Attrition Using Machine Learning  
*Simon Gim and Euntack Im*

A Study on the Factors Development of the Prediction Model of Freight Volume Using the Deep Learning  
*Hyeok Heo, Yangyoung Kun, and Chungku Han*

Big Data Analysis of 'ESG' News Using Topic Modeling  
*Hangju Seo, Donghyuk Jo, and Zhi Pan*

Why do companies become similar, but performance is different?  
*Sung Taek Hwang, Jong Woo Park, and Jiah Hwang*

Theoretical Consideration of The Coexistence of Self-Determination and Innovation Behavior  
*Sung Taek Hwang and Donghyuk Jo*

Applying Walk-through Audit (WtA) in Hospitality Service  
*Hye Jung Kim, Myeong Sook Park, and Jiin Hwang*

**19:00 - 21:00: Welcome Reception**

**Muong Thanh Grand Da Nang Hotel**

**Friday, August 5, 2022**

**9:00 – 17:00: Registration**

**10:00 - 11:50: BCD Session 1**

**VKU Room A**

***Digital Services & Management / Business Intelligence***

**Session Chair: Dr. Jong-Bae Kim**

A Study on the Intention to Continuous Use of Autonomous vehicles Based on advanced driver assistance systems. Focused on HDA system

*Myungho Lee, Jaeyoung So, and Jaewook Kim*

A Study on the Intention to Use of Smart Home Service Based on AI - Focusing on Fine Dust Detection Solution

*Myungho Lee, Youngsoo Kim, and Jihun Park*

The Effect of Non-face-to-face Collaboration System Quality on Business Performance

*Hangju Seo, and Su Young Kim*

Effects of Perceived Value and Innovativeness of Live Commerce on Intention to Use: Focus on Chinese consumers

*Zhi Pan, Donghyuk Jo, and Su Young Kim*

**10:00 - 11:50: BCD Session 2**

**VKU Room B**

***Information Systems / Application / Computational Science***

**Session Chair: Dr. Jong Woo Park**

Cultural Capital of the Red Queen: Focusing on Univore and Omnivore

*Hye Jung Kim and Donghyuk Jo*

A Study on the Effects of Positive Psychological Capital on Organizational Citizenship Behavior: For Teachers of Infant Welfare Service Institutions

*Mi Sook Moon and Hannah Park*

The Effects of Teaching Efficacy and Self-esteem on Job Performance: With the Organizational Members of Early Childhood Educational Service Institutions

*Mi Sook Moon and Zhi Pan*

A Study on the Factors Affecting the Intention to Continue to Use and Net Impacts of Smart Factory

*Seoung Jong Lee, Jong Woo Park, and Hee Jun Cho*

**10:00 - 11:50: BCD Session 3**

**VKU Room C**

***Information Systems / Application / Computational Science***

**Session Chair: Dr. Van Hung Trong**

Efficient Scalable Migrations in the Cloud

*Kolanuvada Mahendra Varma and Giruba Beulah Se*

Blockchain and Homomorphic Encryption Data Sharing Method in Privacy-Preserving Computing

*Linkai Zhu, Zhiming Cai, Sheng Peng and Wenman Wang*

Gas Leakage Detection System with Alarming System

*Muhammad Baballe Ahmad and Mukhtar Ibrahim Bello*

Using Stochastic Gradient Descent On Parallel Recommender System with Stream Data

*Thin Nguyen Si, Dat Vo Ngoc, Quan Ngo Le and Trong Van Hung*

**11:50 - 13:00: Lunch**

**13:00 - 14:50: BCD Session 1**

**VKU Room A**

***Digital Services & Management / Business Intelligence***

**Session Chair: Dr. Jong-Bae Kim**

A study on the factors influencing continuance intention to use Subscription-based OTT platform services

*Zhi Pan and Hee Jun Cho*

A Study on the Effect of Enterprise Risk Management System on Risk Management Capability and Management Performance

*Se Yong Lee, Donghyuk Jo, and Hee Jun Cho*

Research on Continuance Intention of Platform: Influence of Video System, Information, and Service Quality

*Hee Jun Cho and Se Yong Lee*

### **13:00 - 14:50: BCD Session 2**

**VKU Room B**

#### ***Information Systems / Application / Computational Science***

**Session Chair: Dr. Jong Woo Park**

South Korean Smart Manufacturing Strategy  
*Seoung Jong Lee and Hee Jun Cho*

File Sharing Methodology based on Blockchain  
*Sung-Hwa Han*

Research on Malware Detection System Using Artificial Intelligence  
*Minsu Kim*

Differential Privacy Techniques for Healthcare Data  
*Rishabh Subramanian*

### **13:00 - 14:50: BCD Session 3**

**VKU Room C**

#### ***Information Systems / Application / Computational Science***

**Session Chair: Dr. Van Hung Trong**

ANN-based prediction of Nusselt number and stored energy in PCM heat exchanger for solar heat storage  
*Thi Nhan Nguyen, Van Cong Le, Se-Hyeon Noh and Chan-Woo Park*

A YOLO-based Real-time Packaging Defect Detection System  
*Thi Thu Huyen Vu, Dinh-Lam Pham and Tai-Woo Chang*

Survivability and Resiliency Modeling and Analysis of an Internet of Industrial Things using Hierarchical Models  
*Tuan Anh Nguyen, Dugki Min, Eunmi Choi, Iure Fe and Francisco Airton Silva*

A study on Long Short Term Memory Algorithm in Sentiment Analysis with VietNameese Language  
*Thin Nguyen Si, Thien Bui Xuan and Trong Van Hung*

### **14:50 - 15:00: Break**

### **15:00 - 16:50: BCD Session 3**

**VKU Room C**

#### ***Information Systems / Application / Computational Science***

**Session Chair: Dr. Van Hung Trong**

A Performance Analysis of Machine Learning Models for Attack Prediction using Different Feature Selection Techniques  
*Zikra Amin and Ahmedul Kabir*

Finding the optimal ratio of summaries to NEWS articles and establishing a Hybrid NEWS summary system  
*Hyun Park and Yanggon Kim*

A Robust Image Watermarking Technique Using Multi-DWDCT Scheme  
*Khaled Tarmissi, Atef Shalan, Ameera Alshareef and Saud Alotaibi*

Performance Analysis and Comparison of Cerebral Stroke Prediction Models on Imbalanced Datasets  
*Manop Phankokkruad and Sirirat Wacharawichanant*

It takes three to tango: Understanding the world of online gossips through netnography, topic modelling and sentiment analysis.  
*Zulfadzli Drus and Haliyana Khalid*

A Study on the Firm Life Cycle Forecasting Model Using Machine Learning Based on News Articles  
*Siyoung Lee, Weonsun Choi, Jaeyoung So*

### **15:00 - 16:50: BCD Session 4**

**VKU Room D**

#### ***Digital Policy / Information Security & Privacy***

**Session Chair: Dr. Jo DongHyuk**

A Framework for Analysis of Security and Privacy on Hadoop Platform  
*Kimmi Kumari and M Mrunalini*

Visitors Counter with Gate Control and Automatic Room Light Controller (ON/OFF)  
*Muhammad Baballe Ahmad and Mukhtar Ibrahim Bello*

Current Trends in Forensic Investigation through Evidence based on External Storage  
*Abdul Khader Jilani and Shirina Samreen*

Bringing Big Data into Media: A Decision-Making Model for Targeting Digital News Content  
*Zhan Liu and Nicole Glassey Balet*

Online sports media sponsorship effect analysis module development research  
*Weonsun Choi, Kyunghyun Lee, Yoonje Sung, and Gwangyong Gim*

A Study on the Introduction of Blockchain Technology in Non-Governmental Organizations  
*Minwoo Lee, Saeyeon Lee, Heewon Lee, and Gwangyong Gim*

### **16:50 - 17:00: Break**

### **17:00 - 18:00: BCD Session 3**

#### ***Information Systems / Application / Computational Science***

**Session Chair: Dr. Van Hung Trong**

Distance Based Clustering in Wireless Sensor Network  
*Joong Ho Lee*

A study of Web Packet Filtering Algorithm Based on Attack Index  
*Minsu Kim*

Log4J Vulnerability Analysis and Detection Technology in the Snort Detection Rules  
*Ilhyun Lee and Wonhyung park*

**VKU Room C**

### **17:00 - 18:00: BCD Session 4**

#### ***Digital Policy / Information Security & Privacy***

**Session Chair: Dr. Jo DongHyuk**

Policy Management for Zero Trust Environment  
*Sung-Hwa Han*

User Session Monitoring Methodology in Linux Environment  
*Sung-Hwa Han*

Configuration Management System for Distributed Environment  
*Sung-Hwa Han*

**VKU Room D**

### **19:00 - 21:00: Award Presentation/Dinner Banquet**

**Saturday, August 6, 2022**

**9:00 – 12:00 – Registration**

**10:00 - 11:50 – BCD Session 3**

**VKU Room C**

***Information Systems / Application / Computational Science***

**Session Chair: Dr. Van Hung Trong**

Hybrid Recommender System Combined Sentiment Analysis With Incremental Algorithm  
*Thin Nguyen Si and Trong Van Hung*

The Mismatch between Graph Neural Networks' Expressivity and Propagation Graphs in Fake News Detection  
*Sarith Imaduwege, Nandana Kumara and Wishma Samaraweera*

The Use of Domain Ontology and Citation in Co-authorship Recommender Systems  
*Gilang Khasany and Dade Nurjanah*

Dynamic Density based Anomaly Detection  
*Yash Verma*

**10:00 - 11:50: BCD Session 4**

**VKU Room D**

***Digital Policy / Information Security & Privacy***

**Session Chair: Dr. Jo DongHyuk**

Sharing Confidential Documents for Multiuser  
*Sung-Hwa Han*

How to Operate a National Chief Data Officer: A Comparative Analysis on the Governance of Major Countries  
*Jin Myeong Lee, Sang Pil Yoon, Beop Yeon Kim, Hun Yeong Kwon*

A Study of the Emerging Trends in SIM Swapping Crime and Countermeasures  
*Myoung Hoon Kim, Joon Suh, Hun Yeong Kwon*

**11:50 - 13:00: Lunch**

**13:00 - 14:50: BCD Session 3**

**VKU Room C**

***Information Systems / Application / Computational Science***

**Session Chair: Dr. Van Hung Trong**

Robust Deep Support Vector Data Description for Unreliable Data  
*Gia Tai Le, Dokkyun Yi and Jaehyun Ahn*

A study on Company network visualization using cosine similarity and product information Product and Service Information  
*Kyunghyun Lee, Weonsun Choi, Jeon Beonghwa, and Gwangyong Gim*

A Study on Mittre Att@CK Platform Matching Technology Using Malicious Code Meta Information Profiling  
*Dong Cheol Kim, Taeyeon Kim, Jinsool Kim, and Gwangyong Gim*

Data Transforming Technique for Malware Detection  
*Sung-Hwa Han*

**13:00 - 14:50: BCD Session 4**

**VKU Room D**

***Digital Policy / Information Security & Privacy***

**Session Chair: Dr. Jo DongHyuk**

Ethics Education in Data Science - Towards ethical AI Society  
*Ji Hun Lim, Jeong Eun Seo, Jun Hyuk Choi, Hun Yeong Kwon*

Global Trends in the Regulation of Security Vulnerability Disclosure  
*Sang Pil Yoon*

Implications from Analysis of Judiciary Court Rulings on Personal Information in Korea  
*Na Ray Kim, Hye Young Kang, Hun Yeong Kwon*

Considerations for Government Data Governance Framework: based on the National Data Strategy in the US, the UK, and Japan  
*Jeong Eun Seo, Hun Yeong Kwon*

Analysis of OSINT-based security monitoring utilization plan  
*Dain Lee and Hoo-ki Lee*

**14:50 - 15:00: Break**

**15:00 - 17:00: BCD Session 4**

***Digital Policy / Information Security & Privacy***

**Session Chair: Dr. Jo DongHyuk**

**VKU Room D**

Changes in the technological industry environment and the direction of Copyright protection policy  
*Hoo-ki Lee*

Internet of Things Research Trend Analysis Using Topic Modeling  
*Daesoo Choi*

IoT (Internet of Things) based solution trend identification and analysis research  
*Daesoo Choi*

Next Generation Security System using Zero Trust Security Model  
*Ilhyun Lee and Wonhyung park*

A Study on the Intellectual Property of Cosmetics Companies Operating on Metaverse Platform  
*Youngju Kim and Hyeil Jung*

Beauty Industry's Strategic Response to Metaverse Evolution: Focused on Generation MZ  
*Youngju Kim and Hyeil Jung*

**17:00 - 17:30: Break**

**17:30 - 18:30: Closing Ceremony**

**VKU Room D**