



The Korea Academic Society of Digital Business
Administration (KASDBA)
(사)한국디지털 경영학회

ICIDB-2018 Conference Program



**International Conference on Information and Communication
Technology and Digital Convergence Business
(ICIDB-2018)**
Hanoi University of Science and Technology
Hanoi, Vietnam, January 19-21, 2018

■ Date: Friday, Saturday, and Sunday 19-21, 2018,
09:30 – 17:15

■ Place: VDZ Building, Hanoi University of Science and Technology,
Hanoi, Vietnam

■ Organizer:



Hanoi University of
Science and Technology

School of Electronics and Telecommunications (SET)
Hanoi University of Science and Technology



The Korea Academic Society of Digital Business Administration
(KASDBA) (사)한국디지털경영학회



Korea Institute of Digital Convergence (KIDICO)

■ Sponsor:



Korea Small Medium Business Association

Welcome Greetings

Good morning! Ladies and gentlemen, on behalf of the ICIDB-2018 organizing committee, I am honored and delighted to welcome all the participants to the International Conference on Information and Communication Technology and Digital Convergence Business, held at Hanoi University of Science and Technology in Hanoi, Vietnam.

First of all, I would sincerely express my gratitude to the welcoming speaker, Prof. Dinh Van Phong who is a Vice President of the Hanoi University of Science and Technology.

I would also like to extend my sincere thanks to two keynote speakers, Dr. Madjid Fathi who is a Professor of University of Siegen, Germany and Mr. Ja-Young Cho who is a CEO of Information Business Communication Joint Stock Company, South Korea.

I also express my special thanks to invited talk, Dr. Sang-Goo lee who is a professor of the Seoul National University, South Korea and technical talk, Dr. Nguyen Huu Thanh who is a professor of the Hanoi University of Science and Technology, Vietnam.

Particularly, I would like to thank members of the committee and session chairs for their contribution on organizing the conference program and the reviewers for the submitted papers.

My special thanks to the sponsor, Korea Small Medium Business. Finally, I want to thank all authors for their willingness to openly describe their achievements, share experiences, and present their ideas.

This conference aims to provide a platform for participants in the field of information and communication technology and digital convergence business to present their research and share their ideas as well as formulate new research collaborations with them. With your support and cooperation, we will organize high quality conferences in the future as well.

I hope that all participants of this conference have a valuable and wonderful time by treasuring the memories of this conference in Hanoi.

Thank you.

2018-01-19
Changsu Kim (Ph.D) President,
Korea Academic Society of Digital Business Administration

Welcoming Speech

Good morning everybody! Welcome to the International Conference on Information and Communication Technology and Digital Convergence Business.

Firstly, I would like to thank the president of the Korea Academic Society of Digital Business Administration, Changsu Kim, who is co-organizers of this conference.

My special thanks go to all participants in the world who kindly participated in this international conference.

I also want to express my thanks to keynote speakers, Dr. Madjid Fathi who is a Professor of University of Siegen, Germany and Mr. Ja-Young Cho, who is a CEO of IBCT JSC in Vietnam.

My special thanks are extended to invited talk, Dr. Sang-Goo Lee who is a Professor of Seoul National University, South Korea and technical talk, Professor Nguyen Huu Thanh, who is the Dean of School of Electronics and Telecommunications, Hanoi University of Science and Technology (HUST), Vietnam.

Finally, I am also grateful to all of the conference's chairs, committee members, and staff for their support and help.

The main objective of this conference is to provide an excellent opportunity for participants to present their research outcomes and exchange their thoughts and experiences. I believe that all attendances share fruitful new ideas, knowledge, and insights on information and communication technology, as well as digital convergence.

I hope that you have a great time here and in Hanoi.

Thank you.

2018-01-19
Professor Dinh Van Phong
Vice President, Hanoi University of Science and Technology
(HUST)

International Conference on Information and Communication Technology and Digital Convergence Business (ICIDB-2018)

**Hanoi University of Science and Technology
Hanoi, Vietnam, January 19-21, 2018**

About the conference

The Korea Academic Society of Digital Business Administration (KASDBA) is pleased and proud to announce the International Conference on Information and Communication Technology and Digital Convergence Business (ICIDB-2018) that will be held at the VDZ Building, Hanoi University of Science and Technology, Hanoi, Vietnam.

ICIDB-2018 is hosted by the Korea Academic Society of Digital Business Administration, co-organized by the School of Electronics and Telecommunications (SET), Hanoi University of Science and Technology and Korea Institute of Digital Convergence (KIDICO), and sponsored by Korea Small Medium Business Association. ICIDB-2018 has collaborated on publications with the Far East Journal of Electronics and Communications.

The main objective of the ICIDB-2018 is to provide an excellent opportunity for authors working in areas related to information and communication technology and digital convergence business to present their research outcomes and exchange views and experiences. The conference also offers an opportunity to strengthen existing collaborations in order to achieve tangible research outputs in a short time frame.

With your support and cooperation, KASDBA has organized and is committed to organizing more high quality conferences in the future as well.

Organizing Committee

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- Hoang Minh Son, President, Hanoi University of Science and Technology, Vietnam
- Joongho Ahn, Professor, Seoul National University, Korea
- Jintae Lee, Professor, University of Colorado, USA

Organizing Chairs

- Changsu Kim, President, The Korea Academic Society of Digital Business Administration, Korea
- Vu Van Yem, Vice – Dean, Graduate School, Hanoi University of Science and Technology, Vietnam

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- Wonseok Oh, Professor, Korea Advanced Institute of Science Technology (KAIST), Korea
- Sung Sin Kim, Professor, University of Wisconsin–Madison, USA

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- Bhanu Shrestha, Associate Professor, Kwangwoon University, Korea
- Un Kon Lee, Associate Professor, University of Suwon, Korea
- Hyeog-In Kwon, Professor, Chung-Ang University, Korea
- Seung Hyun Kim, Professor, Yonsei University, Korea
- Byung Cho Kim, Professor, Korea University, Korea

- Bumsoo Kim, Professor, Sogang University, Korea
- Joohan Ryoo, Professor, Hanyang University, Korea
- Minghao Huang, Professor, Kyung Hee University, Korea
- Young Kon Kim, Professor, Korea Polytechnic University, Korea

Publication Chair

- Gyanendra Prasad Joshi, Assistant Professor, Yeungnam University, Korea
- Phan Xuan Vu, Assistant Professor, Hanoi University of Science and Technology, Vietnam

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- Arun Agarwal, Associate Professor, Siksha ‘O’ Anusandhan University, India

2018 ICIDB Keynote Speaker-1

Madjid Fathi (Professor)
University of Siegen, Germany



2018 ICIDB Keynote Speaker-2

Ja-Young Cho (CEO)
IBCT JSC (Information Business Communication Joint Stock Company), South Korea



Conference Program

ICIDB-2018 – Conference Schedule

Date – Friday, January 19, 2018

Venue – VDZ Building, Hanoi University of Science and Technology,
Hanoi, Vietnam

Time	Program	Place
9:30 –10:00	Registration	VDZ Building, HUST
10:00 –12:00	<p>Opening Ceremony</p> <p>Welcome Message</p> <ol style="list-style-type: none">1. Prof. Dinh Van Phong, Vice President, HUST2. Changsu Kim, President of KASDBA <p>Best Paper Award</p> <p>Keynote Speech</p> <ol style="list-style-type: none">1. Madjid Fathi, Professor, University of Siegen, Germany	Main Conference Hall VDZ Building

	<p>2. Ja-Young Cho, CEO, IBCT JSC, South Korea</p> <p>Invited Talk</p> <p>Sang-Goo Lee, Professor, Seoul National University, South Korea</p>	Main Conference Hall VDZ Building
	<p>Technical Talk</p> <p>Nguyen Huu Thanh, Professor, Hanoi University of Science and Technology (HUST), Vietnam</p>	
12:00–13:00	Lunch Break	
13:00 -15:00	<p>Vietnam ICT Company Workshop</p> <p>Presentation Session 1-1</p> <p>Presentation Session 1-2</p> <p>Presentation Session 1-1</p>	Main Conference Hall, VDZ Building
15:00–15:15	Coffee Break	
15:15 – 17:15	<p>Presentation Session 2-1</p> <p>Presentation Session 2-2</p> <p>Presentation Session 2-3</p>	Room No. 301 Room No. 302 Room No. 303

Date – Saturday, January 20, 2018

Venue – VDZ Building, Hanoi University of Science and Technology, Hanoi, Vietnam

	Presentation Session 3-1	Room No. 301
10:00 – 12:00	Presentation Session 3-2	Room No. 302
	Presentation Session 3-3	Room No. 303
12:00 - 13:00	Lunch Break	
13:00 – 17:00	Digital Company Visit	Samsung Electronics Vietnam Co.(Bac Ninh)

Date – Sunday, January 21, 2018

Venue – Hanoi City

10:00 – 17:00	City Tour	Hanoi City
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Guidelines for the Presenters

- All participants are requested to participate in the opening ceremony.
- Each speaker will receive 15 minutes of presentation time (10-minute PowerPoint presentation followed by a five-minute question and answer).

There is no specific PowerPoint template. Please bring the PPT in USB.

Presentation Session Details

Presentation Session 1-1, Multimedia Signal Processing

Session Chair: Dr. Phan Xuan Vu

Place: Room No. 301

Date: Friday, January 19th, 2018

Time: 13:00 – 15:00

The Impact of Each Deep Neural Network Layer on the Performance of End-To-End Vietnamese Speech Recognition
(Nguyen Hong Quang)

BLE Beacon based Audible Pedestrian Signal for the Visual Impaired Pedestrians
(Juwan Kim, Jungsook Kim, Sangheon Park, Bongjin Oh, Hyoungsun Kim)

Video-Based Face Recognition using Shape and Texture Information in 3D Morphable Model
(Khoa Tan Truong, Thai Hoang Le)

Automated 3D Reconstruction from an Outline Image of the Buddhist Stupa with Round Ground Plan
(Ratchadaporn Kanawong)

A Novel Proposal of Adaptive Bat Algorithm for Cooperative Spectrum Sensing
(Viet Tuyen Nguyen, Kim Vo, Hai Duong Nguyen, Manh Kha Hoang)

Camera Pose-Independent Action Recognition in Operating Room
(Dinh Tuan Tran, Hirotake Yamazoe, Joo-Ho Lee)

Presentation Session 1-2, Communication System and Technology

Session Chair: Dr. Nguyen Thanh Chuyen

Place: Room No. 302

Date: Friday, January 19th, 2018

Time: 13:00 – 15:00

Pi-based Speed Controller for Vector Control Model of the Induction Motor Drive Using GA Tuned Fuzzy Algorithm

(Thinh Cong Tran, Pavel Brandstetter, Hau Huu Vo, Cuong Dinh Tran, Sang Dang Ho)

Item-based Collaborative Filtering in the Multi-Criteria Recommender System with Ordered Weighted Averaging Operator on Sparse Datasets
(Tri Minh Huynh, Vu The Tran, Hung Huu Huynh, Hiep Xuan Huynh)

Research on Seasonal Arima Model and Predict the Number of Listeners of the Song

(Nguyen Dinh Thuan, Nguyen Thanh Quan)

Cooperative Noma for Downlink D2D with Best Relay Selection: Outage Performance Analysis

(Huu-Phuc Dang, Ngoc-Long Nguyen, Minh Sang Van-Nguyen, Nguyen Thi Tu Trinh, Dinh Thuan-Do)

Performance Measurement Model: In University Performance Achievement
(Eisy Humaira Abdul Azziz, Zeratul Izzah Mohd Yusoh, Azah Kamilah Muda)

Incorporating Fuzzy Set into Dempster-Shafer Theory for Decision Fusion
(Somnuek Surathong, Sansanee Auephanwiriyakul, Nipon Theera-Umpon)

Presentation Session 1-3, Radio Frequency System and Devices

Session Chair: Dr. Bhanu Shrestha

Place: Room No. 301

Date: Friday, January 19th, 2018

Time: 15:15 – 17:15

Field Distribution of Partially Filled Waveguide with Anti- Isorefractive Material

(Hoang Le Huu, Linh Ho Manh, Kiem Nguyen Khac, Chien Dao Ngoc)

Improving Cloud System Performances by using Non-Volatile Memory

(Jisun Kim, Hyokyung Bahn)

28/38 GHz Dual-Band MIMO Antenna with Low Mutual Coupling Using a Couple of DGS

(Duong Thi Thanh Tu, Pham Dinh Son, Vu Van Yem)

Full-Duplex DF Optimal Relay Selection Networks: Secure Performance Analysis

(Thuy Dao Thi Thu, Quyet Nguyen, Dinh-Thuan Do)

Model and Design of a Duplexer for LTE-A Transceiver with Hexagon Cylinder Cavities

(Tran Thi Thu Huong, Nguyen Xuan Quyen, Vu Van Yem)

Online Using Time Window Embedding Strategy in Green Network Virtualization

(Tran Manh Nam, Nguyen Tien Manh, Truong Thu Huong, Nguyen Huu Thanh)

Presentation Session 2-1, Wireless Communication & Networks

Session Chair: Dr. Nguyen Huu Thanh

Place: Room No. 303

Date: Friday, January 19th, 2018

Time: 13:00 – 15:00

Performance Evaluation of Optimal Foraging Approach for Dynamic Spectrum Reconfiguration in Cognitive Radio Networks
(Oki O.A, Olwal T.O Mudali P, Adigun M.O)

A Multi-Criteria Priority-based V2I Communication for Information Dissemination at RSU in Vanet
(Le Tran Duc, Olga Simonina, Mikhail Buinevich, Andrei Vladko)

Interference Avoidance Algorithm for IEEE 802.15.4 based WPANs using 2.4GHz WLAN Frequency
(Hyung-Whan Choi, Dong-Keun Jeon)

Illumination Control System for Horticulture Based on Wireless Sensor Network
(Aran Prakobsant, Rapeepong Rattanawaorahirankul)

A Study of IoT Proxy for Interworking IETF CoAP and OCF IoTivity
(Wenquan Jin, Do Hyeun Kim)

Presentation Session 2-2, Radio Frequency System and Devices

Session Chair: Dr. Vu Van Yem

Place: Room No. 302

Date: Friday, January 19th, 2018

Time: 15:15 – 17:15

Microstrip Bandstop Filters Design Using Meander Spurline Structure
(Bhanu Shrestha)

Deep Learning-Based Lip Analysis System
(Jin Sol Choi, Daeyeol Kim, Sooyoung Cho, Chae-Bong Sohn)

Microstrip Ultra-Wideband Bandstop Filter using Interdigital Capacitor
(Chang-Soon Kim, Tae Hyeon Lee, Kwang Seob Shin, Bhanu Shrestha,
Kwang Chul Son)

The Effects of VR Simulation Game on Driving Fear and Efficacy
(Jeong-Min Park, Ghee-Young Noh)

A Triple Band Antenna using Dipole and Interdigital Structures
(Tuanjai Archevapanich, Pongsathorn Chomtong, Vanvisa Chutchavong,
Prayoot Akkaraekthalin)

W-band Resistive Mixer Integrated Circuit with Broadband Performance in
0.15 μm GaAs pHEMT Technologies
(Wonseok Choe, Jisu Choi, Keyongmok Ryu, Jinho Jeong)

Presentation Session 2-3, ICT Convergence

Session Chair: Dr. Nguyen Dinh Thuan

Place: Room No. 303

Date: Friday, January 19th, 2018

Time: 15:15 – 17:15

Cinematic Storytelling Game “Noah Ark”: Implementation and Design
(Woo-Hyun Park, Yun-Gyung Cheong)

SitBuCE: A Small Data-Driven Generalization Strategy for Technology
Maturity Status Mapping
(Adigun M.O, Kabanda S.K, Thinyane M)

An Efficient Conversion Approach of the Bangla Infinite Verb Sentence into
UNL
(Md. Nawab Yousuf Ali, Golam Sorwar, Md. Shamsujjoha)

The Structural Influences of Suicide-related Keywords Search on Suicide
Rate in Korea
(Hye-Ryeon Young, Ha Na Kang, Ghee-Young Noh, Hyun-Seok Hwang)

A Novel Similarity Measure for Trace Clustering Based on Normalized
Google Distance
(Hong-Nhung BUI, Quang-Thuy HA, Tri-Thanh NGUYEN)

Factors Affecting Social-Presence and Self-Presence in Virtual Reality
Media
(Sang-Min Park, Min-Ji Choe, Jeong-Min Park, Ghee-Young Noh)

Presentation Session 3-1, Advanced Computing, IoT and Smart Cities

Session Chair: Dr. Shashidhar Ram Joshi

Place: Room No. 301

Date: Saturday, January 20th, 2018

Time: 10:00 – 12:00

Smart Indoor Farming using Intel Edison and Amazon Web Services-
Internet of Things
(Pavan Kumar Konda, Hamid Shahnasser)

Redundant Association-Rule Mining Reduction for Rosewood Crime Arrest
Planning
(Wararat Songpan, Ngamnij Arch-in, Rit Loaphanom)

An IoT Smart Home Design with Security Consideration
(Dongmin Lee, Seunghyun Oh)

An Effective Depth Map Navigation for Mobile Robot in Indoor
Environments
(Dang Khanh Hoa, Than Duc Viet, Vu Minh Hoang, Vu Song Tung, Nguyen
Tien Dzung)

Design of a Cost-Effective Soil Monitoring System to Support Agricultural
Activities for Smallholder
(Tien Cao-Hoang, Trong Tinh Pham Van, Can Nguyen Duy)

A Blockchain-based ID/IP Mapping and User-friendly Fog Computing for
Hyper-connected IoT Architecture
(Moon Yong Jung, Won-Suk Kim, Sang-Hwa Chung, Ju Wook Jang)

Presentation Session 3-2, ICT and Advanced Computing

Session Chair: Dr. Woong Cho

Place: Room No. 302

Date: Saturday, January 20th, 2018

Time: 10:00 – 12:00

Web Cache Optimization with Bayesian and Maximum Likelihood
Estimation
(Prapai Sridama)

Development of Simulator for Smart Grid System
(Hanho Kim, Haesung Tak, Hwan-gue Cho, Heeje Kim)

Development of PnP Vehicle: Basic Concept and Its Applications
(Woong Cho, Jeaho Hwang)

A Supervisory Controlled System for the Alcohol-Free Beer Production
Process
(Dinh Van Thanh, Dinh Thi Lan Anh , Nguyen Tuan Anh,Dang Xuan Hieu,
Bui Quang Minh, and Nguyen Tuan Anh)

Wrist Pulse Measurement for Pulse Diagnosis in Traditional Chinese
Medicine
(Viet Dung Nguyen, Le Thu Thao Dao, Anh Vu Tran, Thai Ha Nguyen)

Fuzzy Multilayer Perceptron with Cuckoo Search
(Suwannee Phitakwinai, Sansanee Auephanwiriyakul, Nipon Theera-
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Presentation Session 3-3, Digital Convergence Business

Session Chair: Dr. Chang Su Kim

Place: Room No. 303

Date: Saturday, January 20th, 2018

Time: 10:00 – 12:00

Performance Analysis and Comparison for Linked Data Index Structure
(Sun Yu Xiang, Yongju Lee)

Insight the Financial Risk Measurement to Support the Effective
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(Patsiree Worawachtanakul, Tanakorn Likitapiwat, Chaipat Lawsirirat)

Word Cloud of Online Hotel Reviews in Thailand for Customer Satisfaction
Analysis
(Vimolboon Cherapanukorn, Phasit Charoenkwan)

A Study on Business Ecosystem of 3D Printing Contents Distribution
Platform: Using Service Value Network Analysis
(HyeogIn Kwon, Seol-Hee Kim)

An Augmented Reality Based Approach for Worker Support System on
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(Philjun Moon, Young-Woo Kim, Jinwoo Park)

Conference Venue Map

MAP AND GUIDANCE TO THE HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY



Conference Venue: VDZ Building, Hanoi University of Science and Technology, Hanoi, Vietnam

Tel.: +(84) - 43- 8692242

Email: yem.vuvan@hust.edu.vn (Prof. Vu Van Yem)



ICIDB-2018 Secretariat
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Keynote Speech- 1

1. Supporting Smart City Concepts through Green Knowledge Management and Big Data Analysis

Prof. Dr. Madjid Fathi

Professor

University of Siegen, Germany

Abstract - The knowledge-based city is a pioneer concept that has been developed long time ago before current trends of urbanization, mobile accessibility and intelligent networking have sharply increased. The knowledge-based city can be even seen as one of the foundations of today's Smart City research. A city is an organization that is constantly in a dynamic movement due to in-/decreasing population, changing technologies (e.g. data gathered by IoT devices), changing politics or new legal regulations. This is why intelligent, flexible and fast-reacting, data-driven analysis and support for city administration, involvement and informing of citizens, but also in the city planning are necessary. E-Government is in need of fitting knowledge and processes. Data-driven approaches provided by Big Data and IoT infrastructure enable a continuous evaluation of different target values and conditions, such as water and air quality, resource management, traffic analysis, disaster prevention and prediction, but also decision support on different levels. In this context, knowledge management is seen as a background which deals with the best practices for storing, disseminating, accessing and using the right information in the right place at the right time.

The integration of environmental parameters and monitoring data into today's Smart City overall strategies is a huge challenge, as rising traffic and industries cause pollution and the lessening of life quality, especially in huge cities. In this talk, the developed concept of Green Knowledge Management and its applicability to support Smart Cities will be presented, considering an integration of environmental aspects into knowledge management to support analysis of environmental data and decision making, thus promoting ecological sustainability. Furthermore, a use case which deals with traffic management in a Smart City will be presented in form of a prototype system for analysis of the current traffic situation by means of various environmental parameters.

Keynote Speech- 2

2. Introduction of Big Data Analysis based on Social Network Analysis Algorithm & Case study

Ja-Young Cho

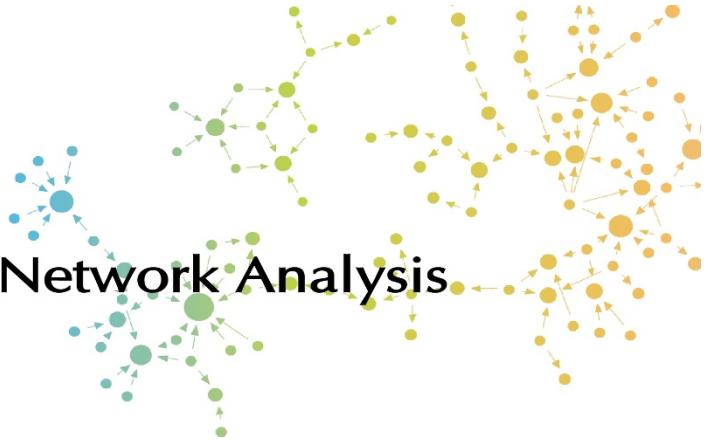
CEO

IBCT JSC (Information Business Communication Joint Stock Company)
South Korea

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1. Big Data & Social Network Analysis
2. NetMiner
3. Business Applications of SNA
4. Company profile - Cyram & IBCT

1. Big Data & Social Network Analysis



. 사이람

The Age of Networks

- " Network is the core structure and dynamics mechanism of human, society and nature. "

Hyper-Connectivity

Sensor Network (IoT)

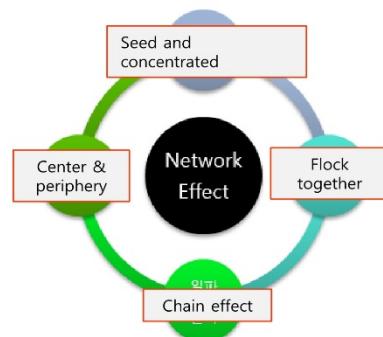
Social Network (Facebook, Kakao)

Financial Network

Knowledge Network

Brain Network

Criminal Network



The Age of Complexity

- "Complexity" is the main characteristics of Network Society."

Massive Digital Footprints

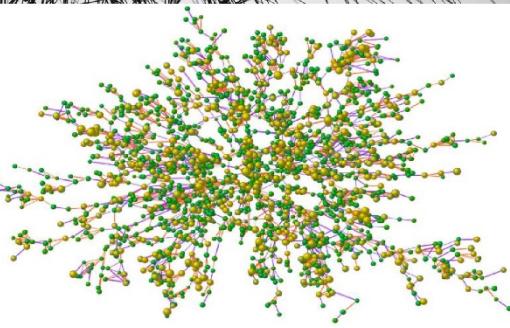
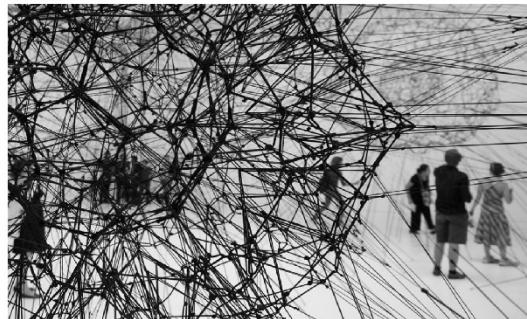
All human behaviors are Data!



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5

Human Behavior \Rightarrow Connection \Rightarrow Link is Big & Complex!



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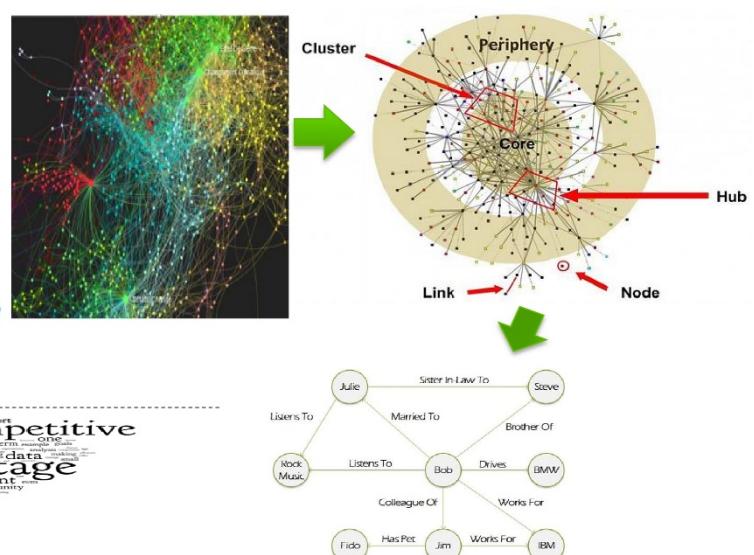
The Age of Analytics

- " Network Analytics is the science of Complexity. "
 - Legacy way of statistics only is insufficient to understand the complexity of network **society**

"Big data analysis? To get the insight out of complexity, it is not the matter of data size but the matter of pattern-finding in it."

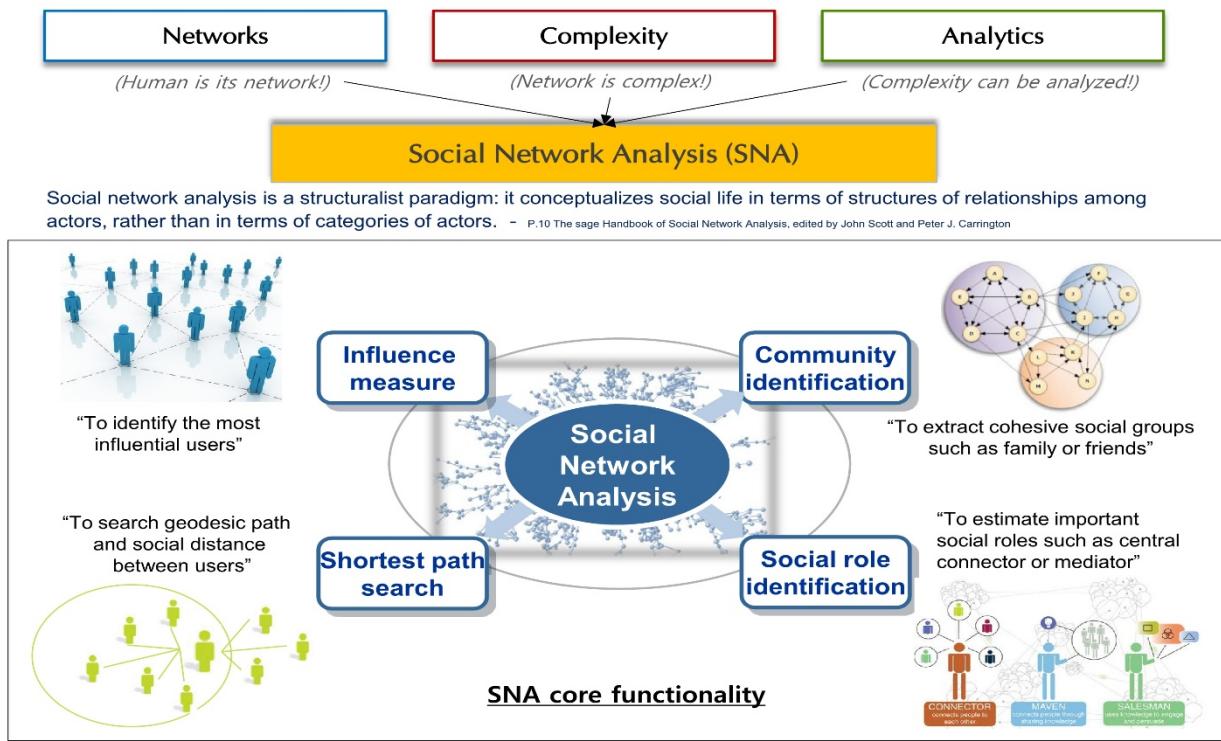
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Social Network Analysis(SNA) - What it is for?



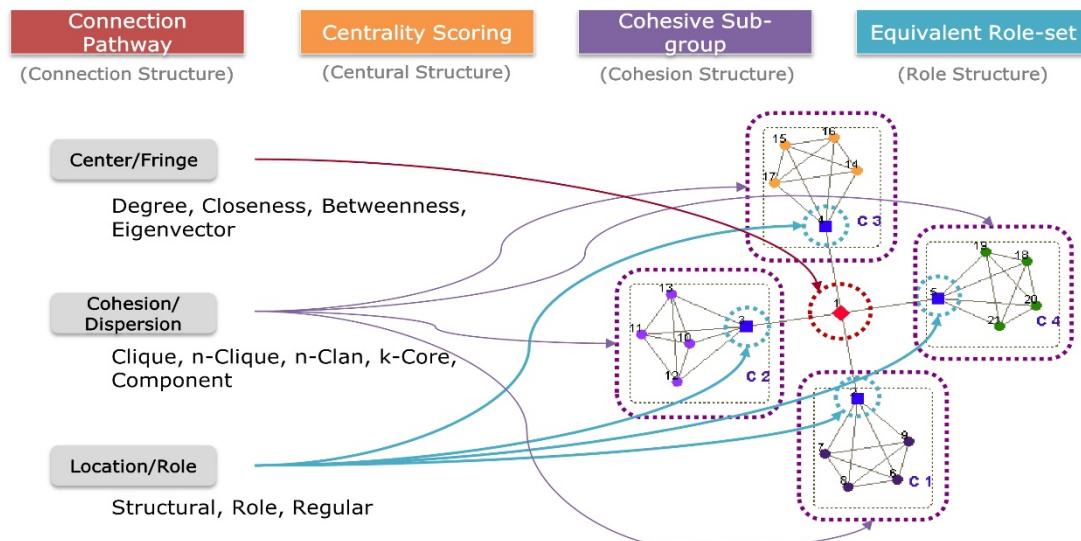
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Social Network Analysis(SNA) - What it is for?

- SNA is including various scoring & clustering techniques same as other analysis approaching, as well, it provides proper network visualization interfaces (GUI) for the result.



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Network(Link) Data

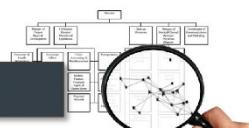
- The link is relational data between objects, there can be defined various type of relations in a same object.

Type of object	Example	Data source
Social Relations	(Friendship relationship) A & B have been known each other.	Survey poll
	(Family relationship) A & B were married and born C.	ID card
	(Online relationship) A & B are friend of Facebook / Tweeter.	Friend list
Interaction	(Communication) A sent Phone/email/Viber message to B.	Log of phone/email/Viber
	(Business) A company sold product to B company.	Record of tax invoice
	(Collaboration) Author A & B wrote a paper together.	Coauthor list
Flows	(Flow of funds) A remit money to B.	Account history record
	(Flow of information) A quoted B's paper.	Lost of quoted papers
	(Flow of resource) Mr. Kim moved from department A to department B.	Record of HRM.
Similarities	(Flow of population) Moved from city A to city B.	Notification of moving in and out
	(Logistics) Dispatched delivery from city A to city B.	Delivery vehicle travel path
	(Similarity of attribute) A & B likes actress C.	Logs of "Like" on Facebook
	(Join event) A & B participate to same event and conference	Participation list
	(Co-purchase) A & B bought beers together.	Buying list
	(Co-occurrence) Keyword A & B appeared in 154 papers.	Contents of papers

Core Value of SNA

- Key point of data is the connectivity, the connectivity can be approached with view point of the network relation effectively.
- We are living in the epoch that understanding and insight of relationship must be the core source of business competitiveness.

SNA is the Essential Technology of Business!



Core Value of SNA

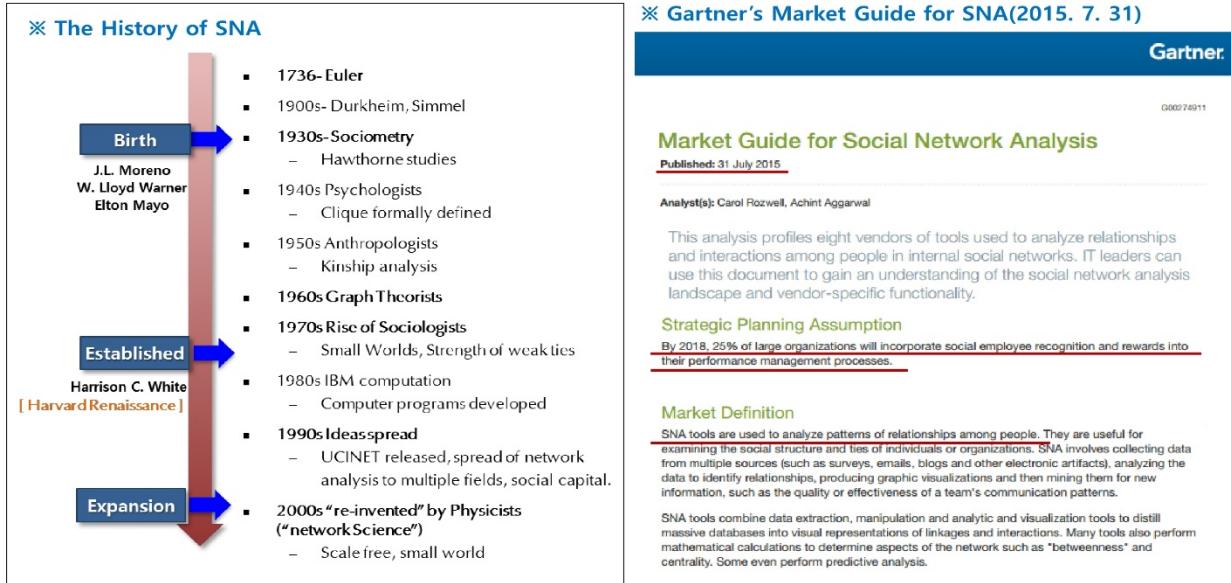
- 1 Visualization of invisible relations.
- 2 Visualization of intrinsic pattern of relations
- 3 Define rule of existing relationship, predict future relationship
- 4 Finding hidden Key Player Influencers
- 5 Identify structural weak points and resilience
- 6 Visualization of Knowledge / information diffusion structure and path.

Approaching Statistics vs SNA

	Statistics	Network
Basic view point	Reductionism (Atomism)	Totalitarianism (Structuralism)
Target data to analyze	Attribute data of object	Relationship data between objects (basically) Parent elements
Data collection	Sampling	
Key analysis method	Correlation between attributes (Similarity of attributes)	Structural location (Similarity of relationship patterns)
Key analytical factors	Average, correlation, regression, cluster	Density, centrality, cohesion, role group, etc.
Purpose	Identify trends	Identify actual points
Application	Number of infected, Symptoms	Infection path / prevalence

SNA - Beyond the Academia

- SNA has been studied so far in academic field since it was born. However, recently, under the umbrella of big data analysis, it is getting more business recognition in the area of organization diagnostics, social marketing, customer experience management and fraud detection system.
- Gartner newly released Market Guide for Social Network Analysis as of July 31st 2015, which may denote a separate commercial market is being established.



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Applications of SNA

- At the business, academic, public fields, SNA is utilizing to 1) Analyze & visualize the relationship/interaction structure, 2) Analyze & predict activity patterns, 3) Understand the flow of information & knowledges, 4) Assess effectiveness & reliability, 5) identify role.
- Globally, interests to big data analysis & predict is rising, and the application range is expanded, as well, in particular, it is turning to the trend of convergence with other analysis, such as statistics / machine learning / text mining.

- Understand the structure of knowledge creation & distribution based on knowledge map.
- Identify expert and visualize collaboration structure.
- Technology trend analysis.
- Emerging Topic prediction.

- Monitoring real-time rising message & issues.
- Analyze effectiveness of user/media diffusion.
- Identify main topics on social media.



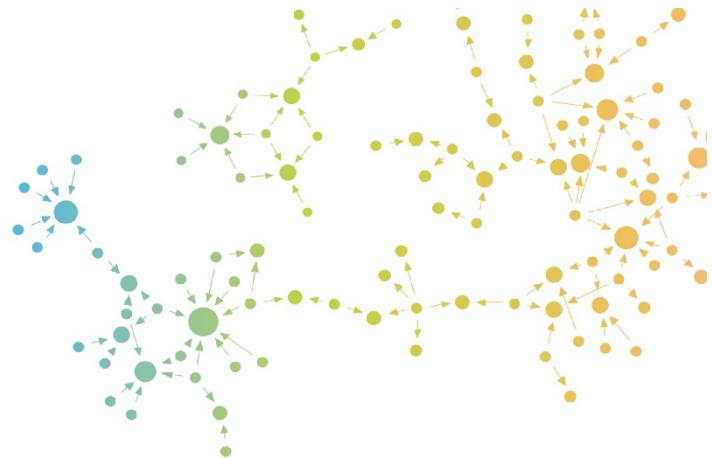
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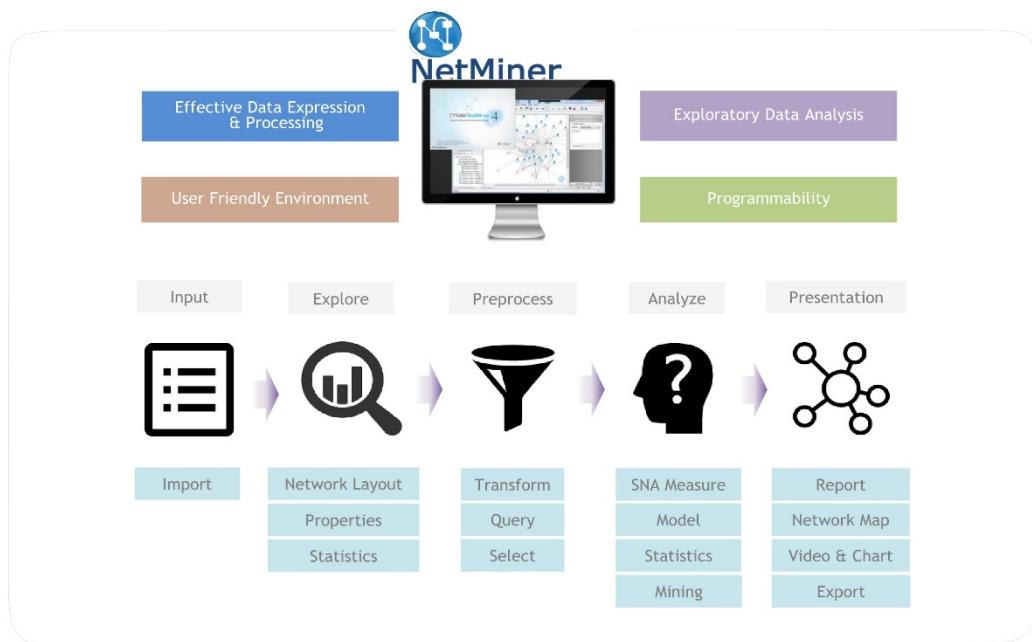
15

2. NetMiner



NetMiner : a general SNA product embodied with technology

- NetMiner is a Premium Network Analysis Software Tool and reflects the analytical requirements.
- It provides a lot of analysis methods such as **Social Network Analysis, Statistics, Data Mining**.
- The results of analysis can be viewed by visualization in 2D and 3D



Core Value of NetMiner

- It has innovative features to improve the productivity of data analysis.
- It enables users to easily analyze the data by providing a lot of ways to analytically handle data.

High Usability

- User friendly GUI and combine with Python script environment.
- Meet various user requirements from beginner of SNA to experts.
- Exploratory analysis through organic combination of analysis and visualization

Time-Efficiency & Productivity

- Reduce analysis time by efficiently processing large amounts of network data.
- Improved work productivity through features such as history management for data fluctuation and analysis, session-based analysis options and results storage, and automatic iteration through script function.

Creative Insights

- Intuitive understanding of data and analysis results through visual analysis.
- What-if analysis capabilities make it easy to experiment the expected results according to data and conditions change.
- Enabled converged analysis by combining SNA, statistics, graph mining, and machine learning methods.

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2017 New Feature of NetMiner

- NetMiner can extract the words from unstructured text data and create a network between extracted words.
- Word Cloud and Topic modeling are embedded in NetMiner to visualize the importance of words and identify topics in the text.

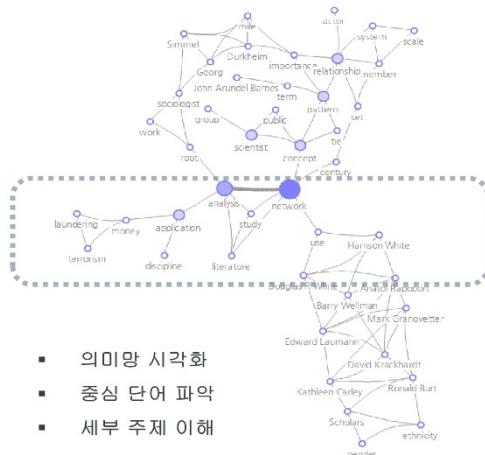
Semantic Network Analysis of NetMiner

Text

History [edit]

Social network analysis has its theoretical roots in the work of early sociologists such as Georg Simmel and Emile Durkheim, who wrote about the importance of studying patterns of relationships that connect social actors. Social scientists have used the concept of "social networks" since early in the 20th century to connote complex sets of relationships between members of social systems at all scales, from interpersonal to international.^[9] In the 1930s Jacob Moreno and Helen Jennings introduced basic analytical methods.^[10] In 1954, John Arundel Barnes started using the term systematically to denote patterns of ties, encompassing concepts traditionally used by the public and those used by social scientists: bounded groups (e.g., tribes, families) and social categories (e.g., gender, ethnicity). Scholars such as Ronald Burt, Kathleen Carley, Mark Granovetter, David Krackhardt, Edward Laumann, Anatol Rapoport, Barry Wellman, Douglas R. White, and Harrison White expanded the use of systematic social network analysis.^[11] Even in the study of literature, network analysis has been applied by Anheier, Gerhards and Romo,^[12] Wouter De Nooy,^[13] and Burgert Senekal.^[14] Indeed, social network analysis has found applications in various academic disciplines, as well as practical applications such as countering money laundering and terrorism.

Semantic Network



- 의미망 시각화
- 중심 단어 파악
- 세부 주제 이해

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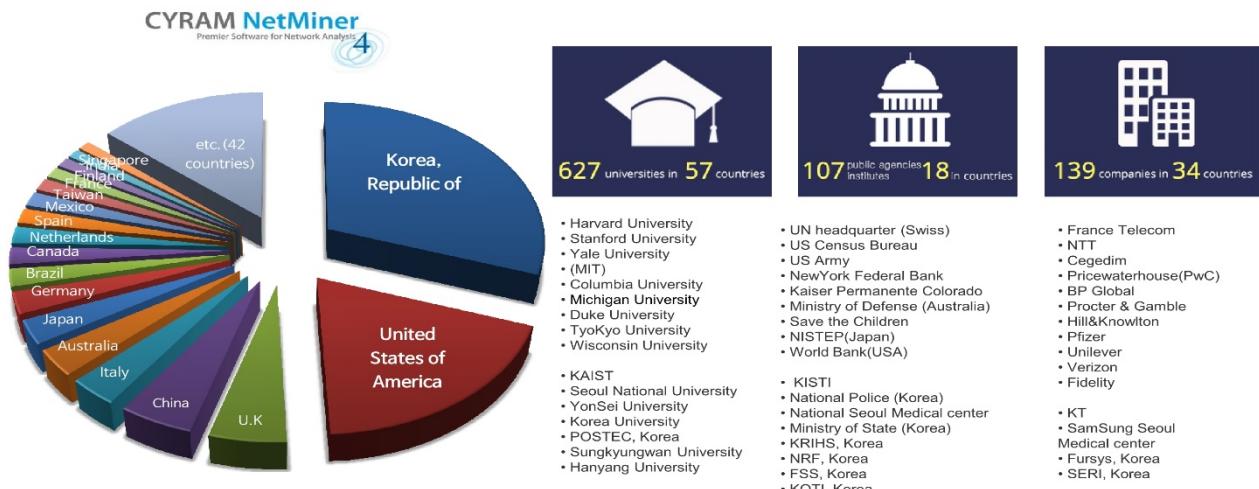
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NetMiner Global Market Penetration

- Up to year 2017, more than 900 universities / Organizations / Enterprises in more than 60 countries are using NetMiner for their own purposes.



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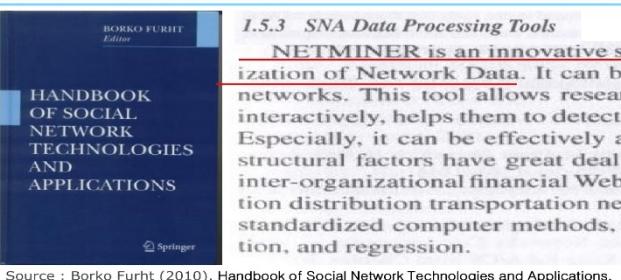
NetMiner Reputation

- Netminer is recognized as innovative, user-friendly software in major SNA publications.

Table 38.4 Scores for some general packages

	Functionality						Support		User-friendly
	Data	Vis.	Desc.	Proc.	Stat.	Dyn.	Doc.	Help	
MulNet	+	-	+	-	+	-	0	+	+
NetMiner 3	++	++	++	++	+-	+-	+	+	++
DRA	++	++	+	++	+	+	+	+	+-
Pajek	+	++	+	++	0	+-	+	0	+-
statnet/sna	++	+	++	++	++	+	++	+	+-
UCINET + NetDraw	++	++	++	++	+	0	++	+	+

Source : Huisman, M. & Van Duijn, M.A.J. (2005). **Software for social network analysis.**
In P.J. Carrington, J. Scott, & S. Wasserman (Eds.), p.311 *Models and methods in social network analysis*
New York: Cambridge University Press.



Source : Borko Furht (2010). **Handbook of Social Network Technologies and Applications.**
p.19 *SNA Data Processing Tools*. Springer Press.

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3. Business Applications of SNA

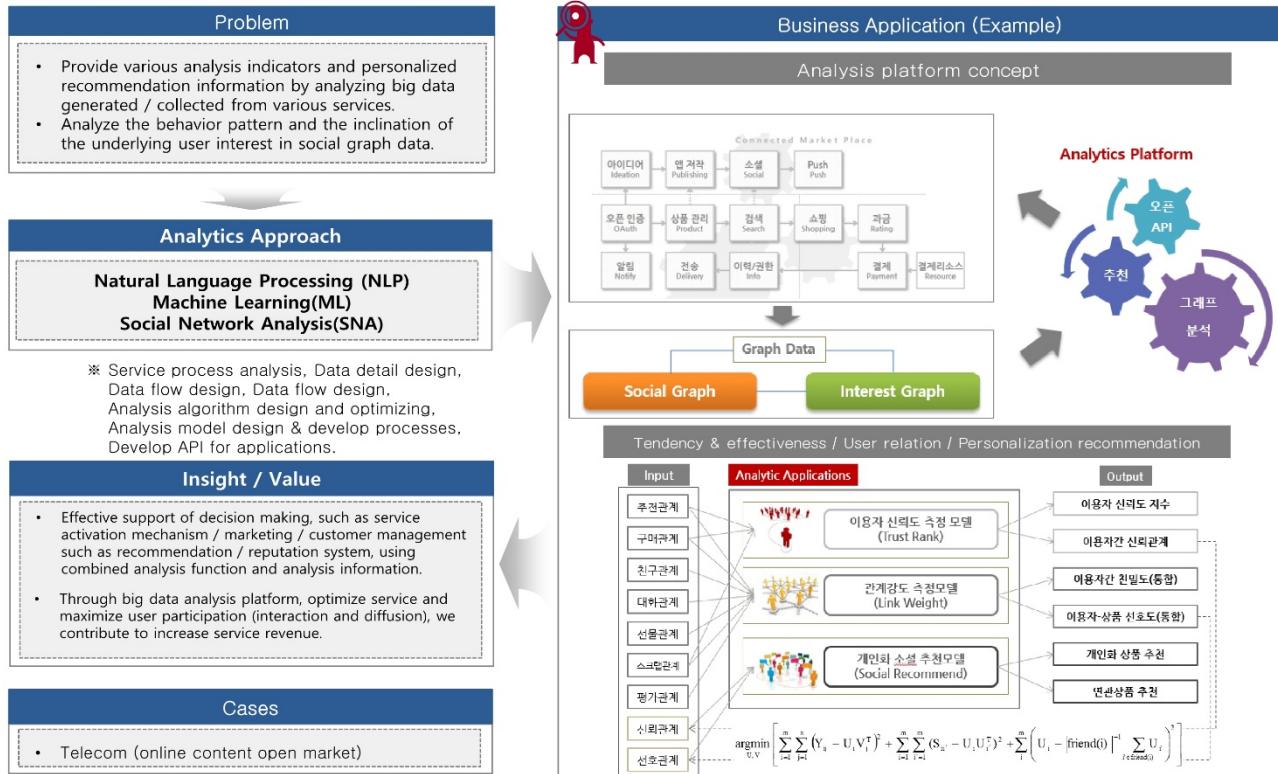
Case studies



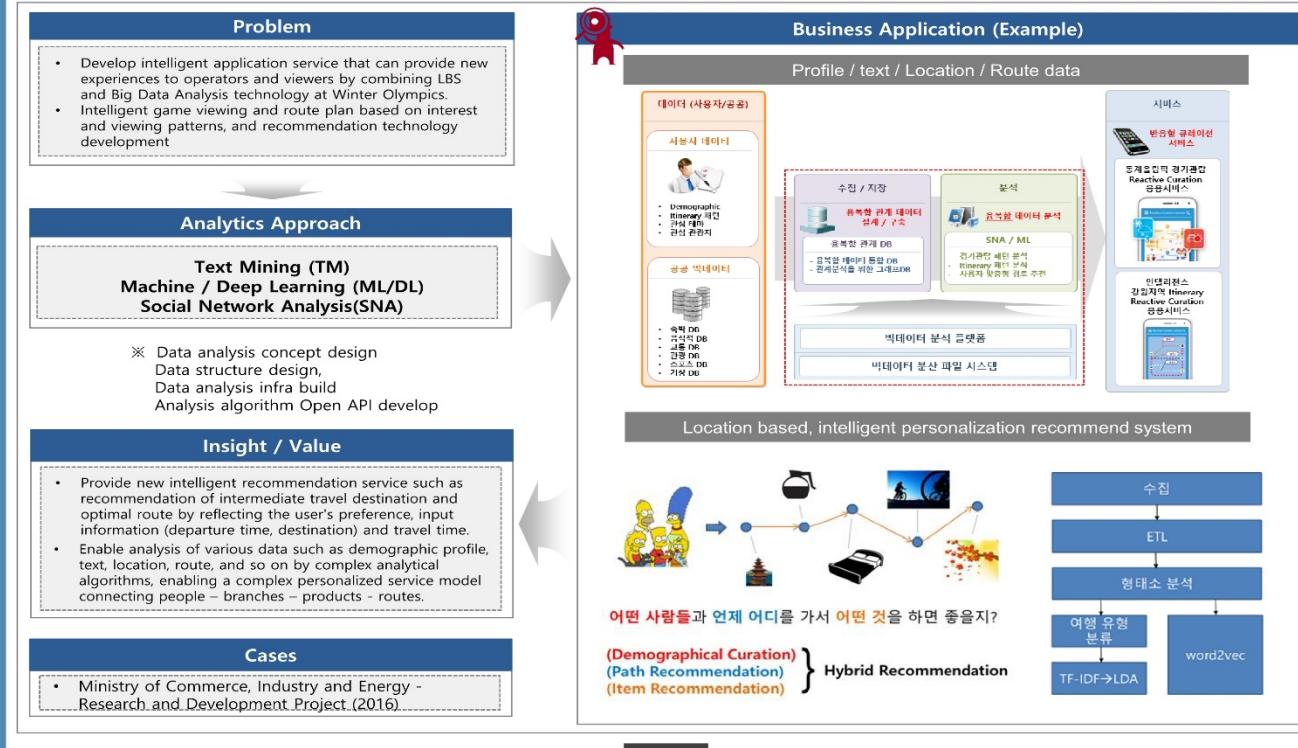
Cyram & IBCT are data science companies specialized social network analysis.



Big Data Analytics Platform



Location-based Intelligence Service

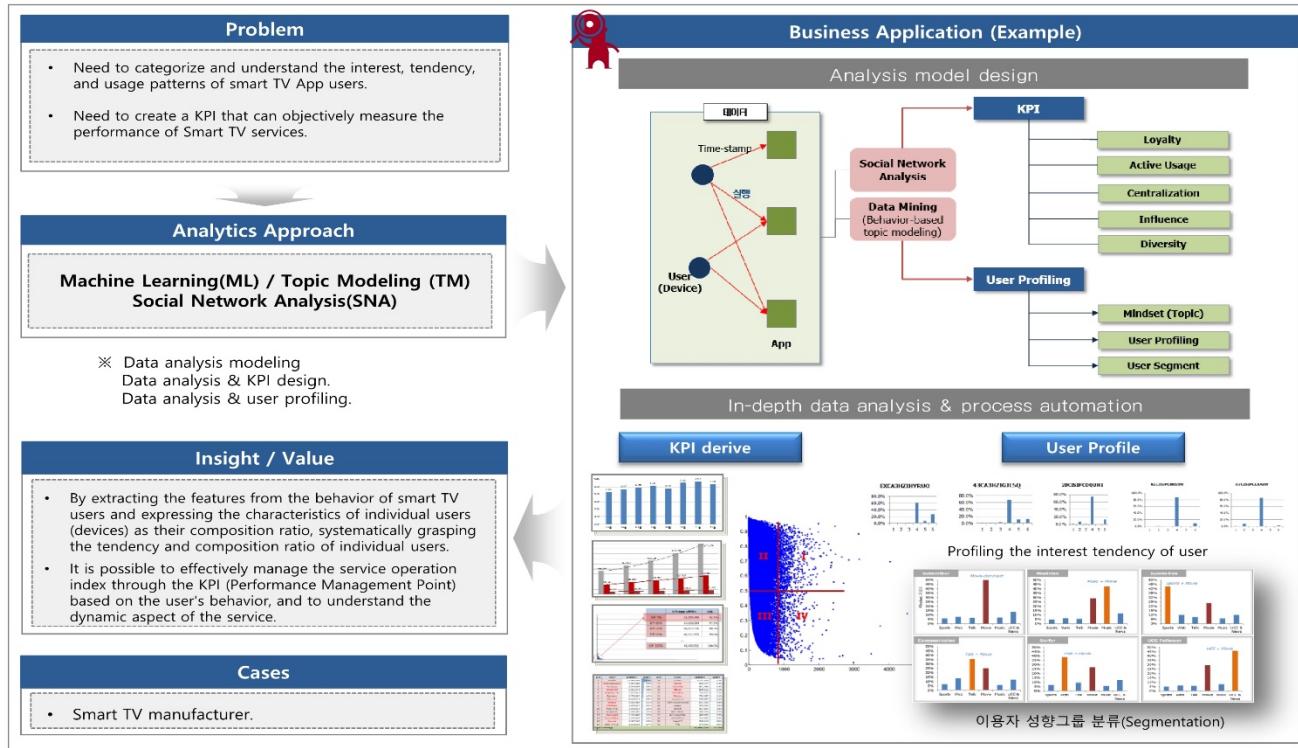


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Behavior-based Customer Profiling

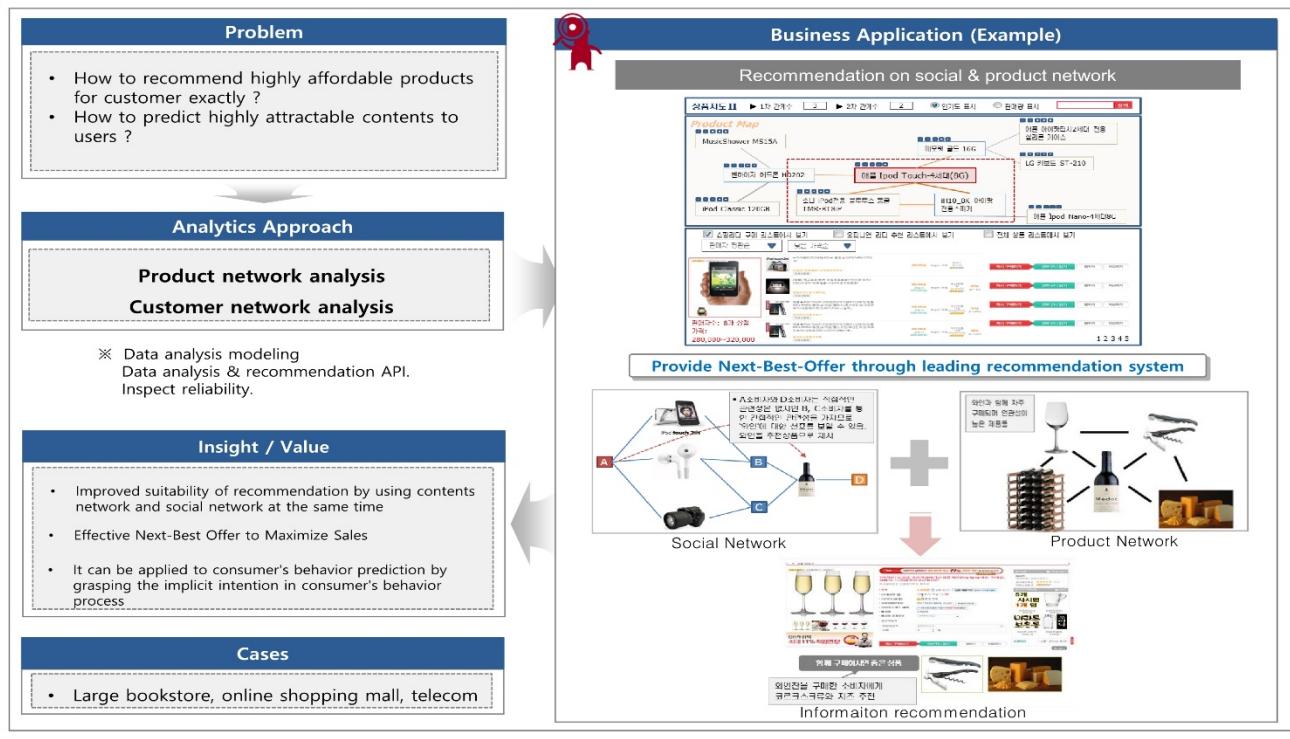


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Personalized Recommendation

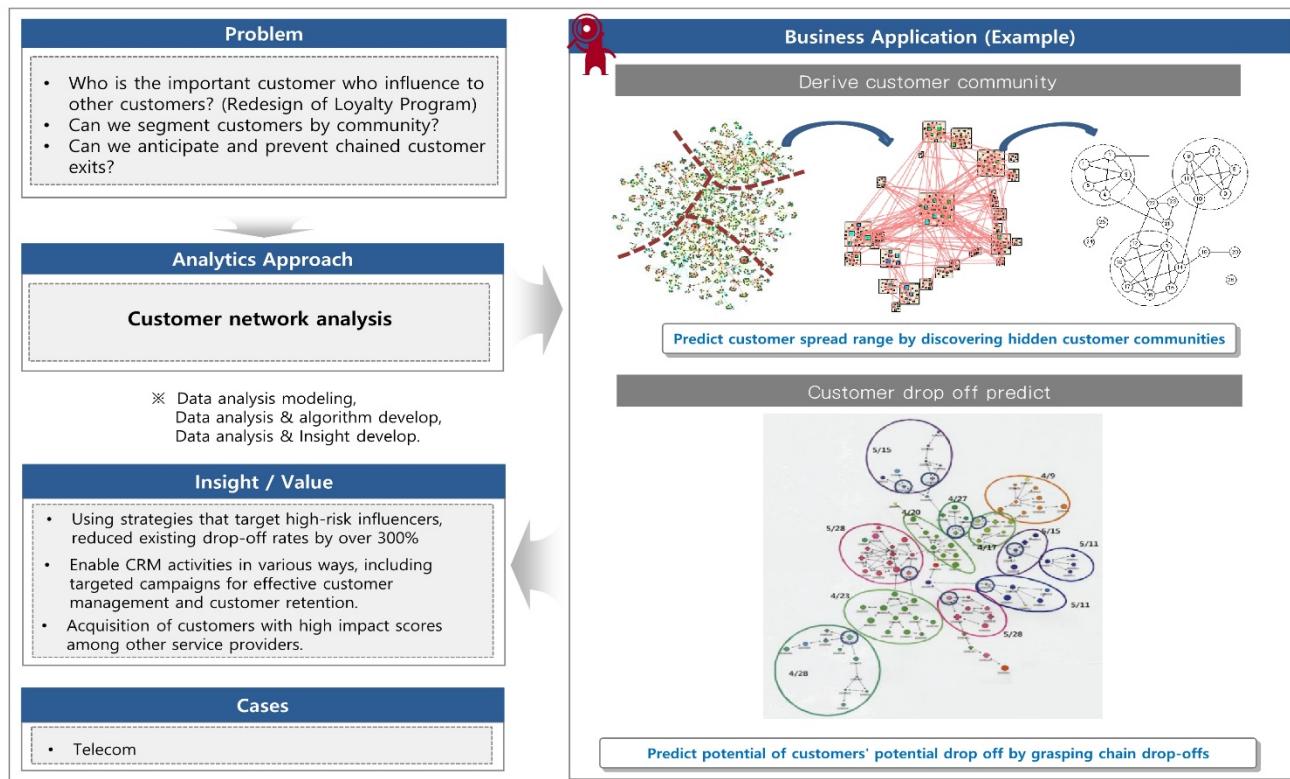


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Customer Intelligence

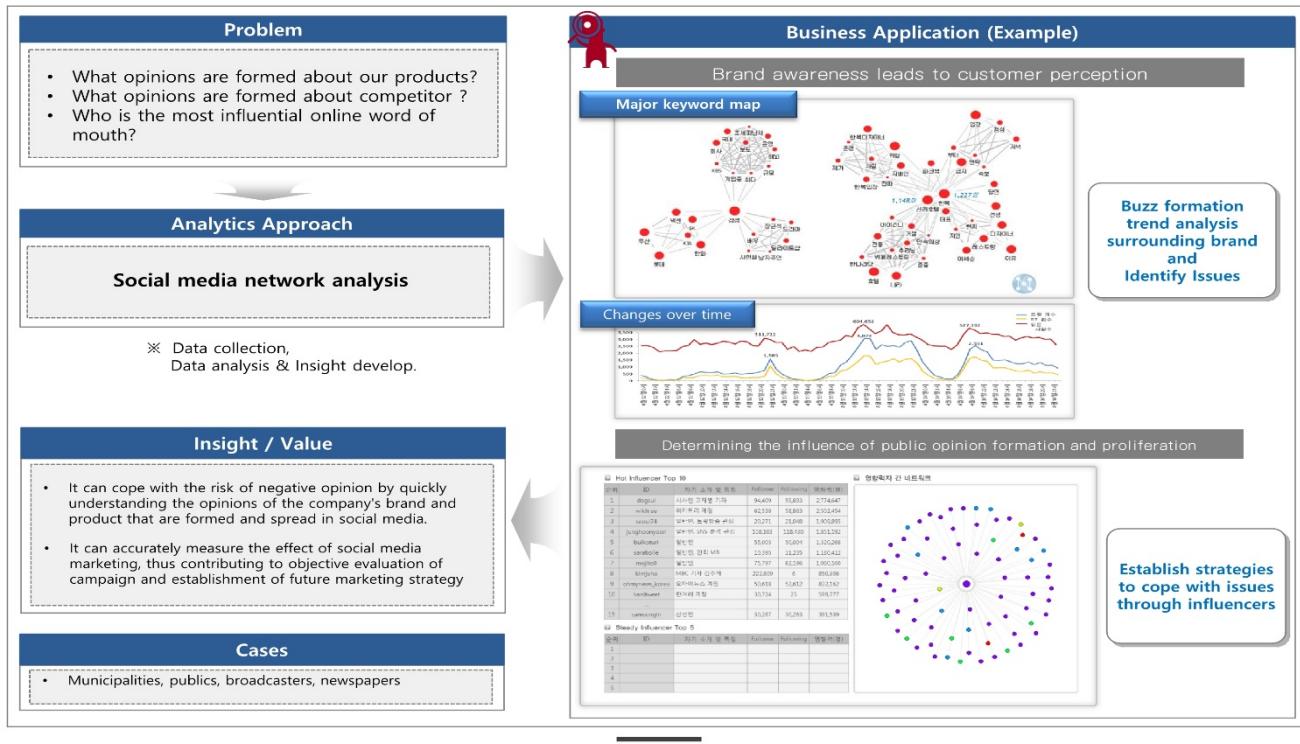


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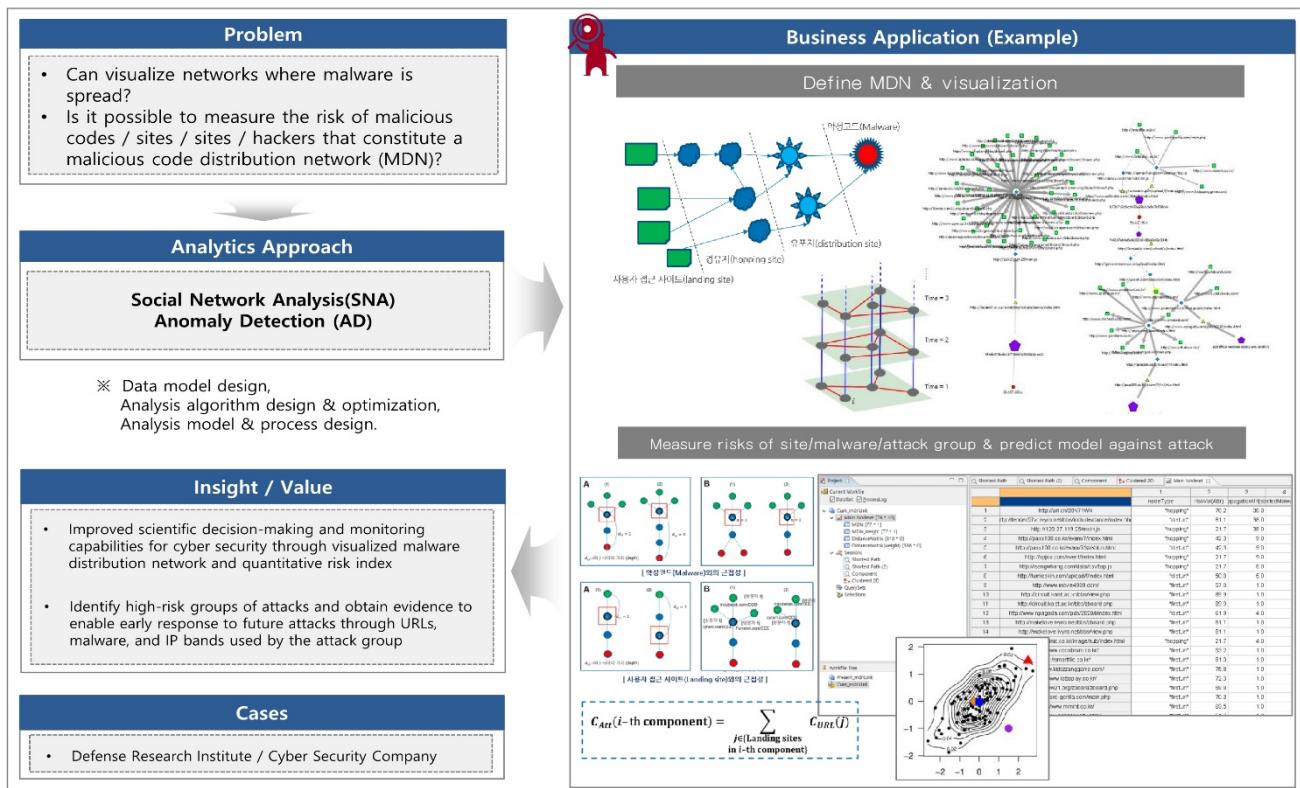
Brand Reputation Monitoring



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Cyber Security

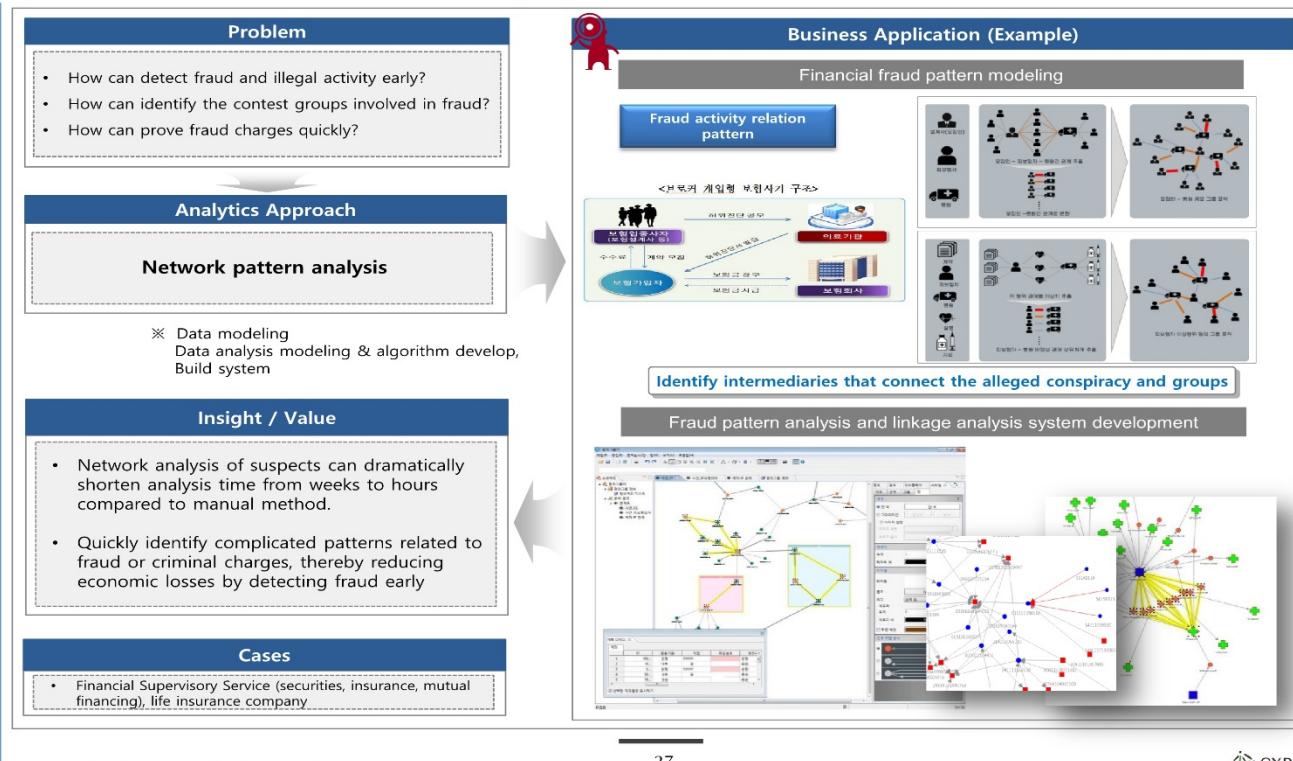


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22

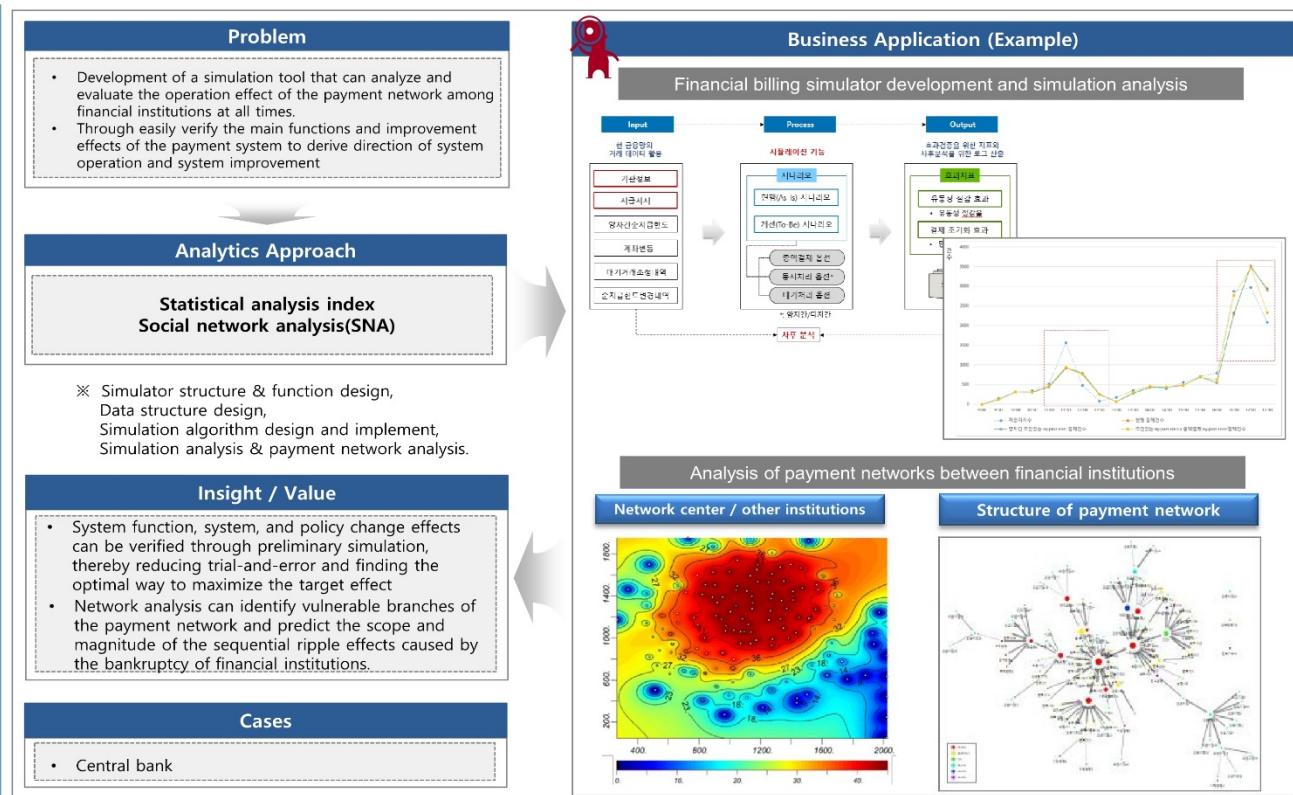
Fraud Detection



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Financial Settlement Simulation

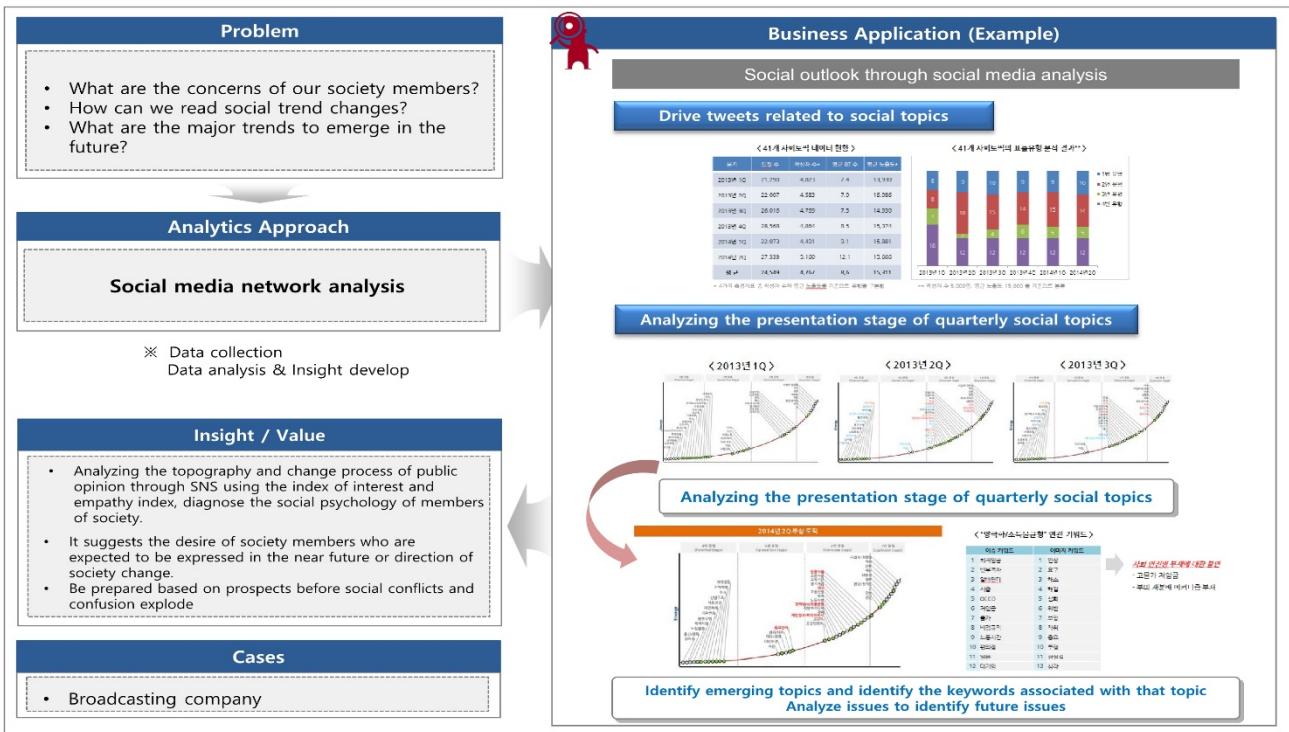


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Social Trends Outlook

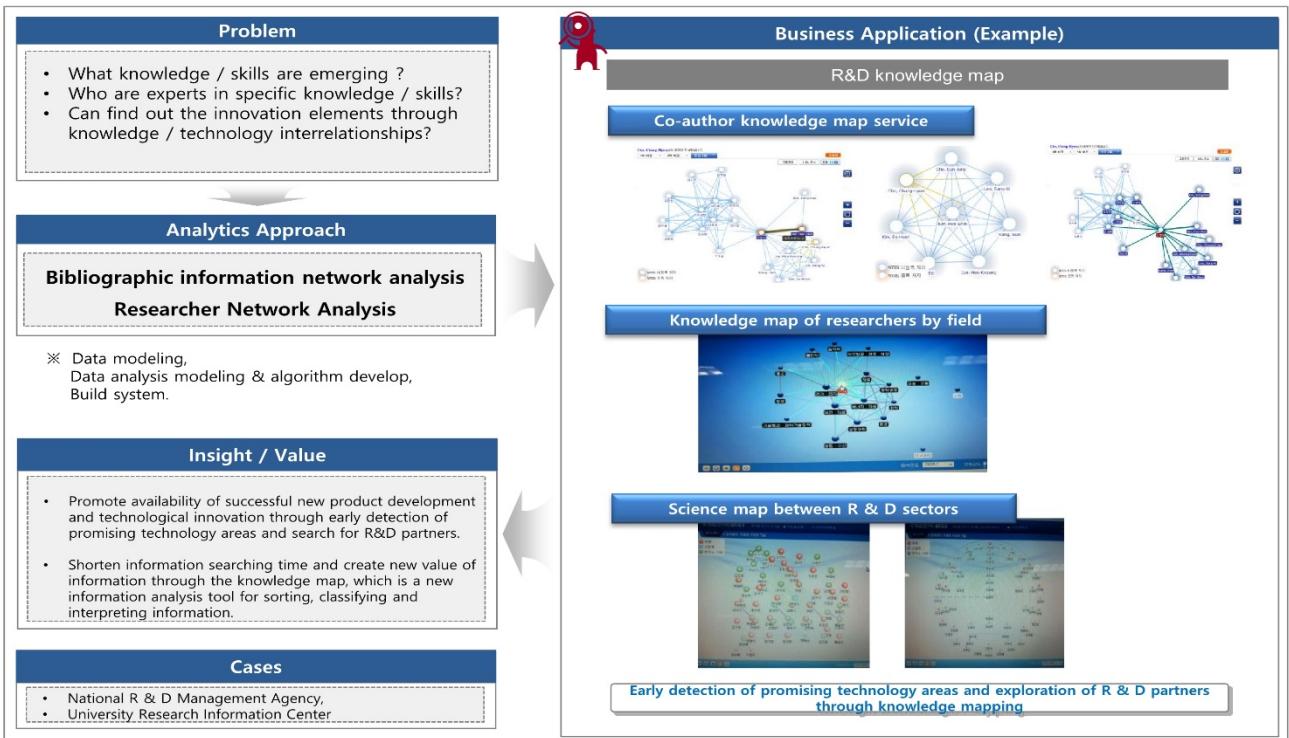


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Emerging Technology Detection



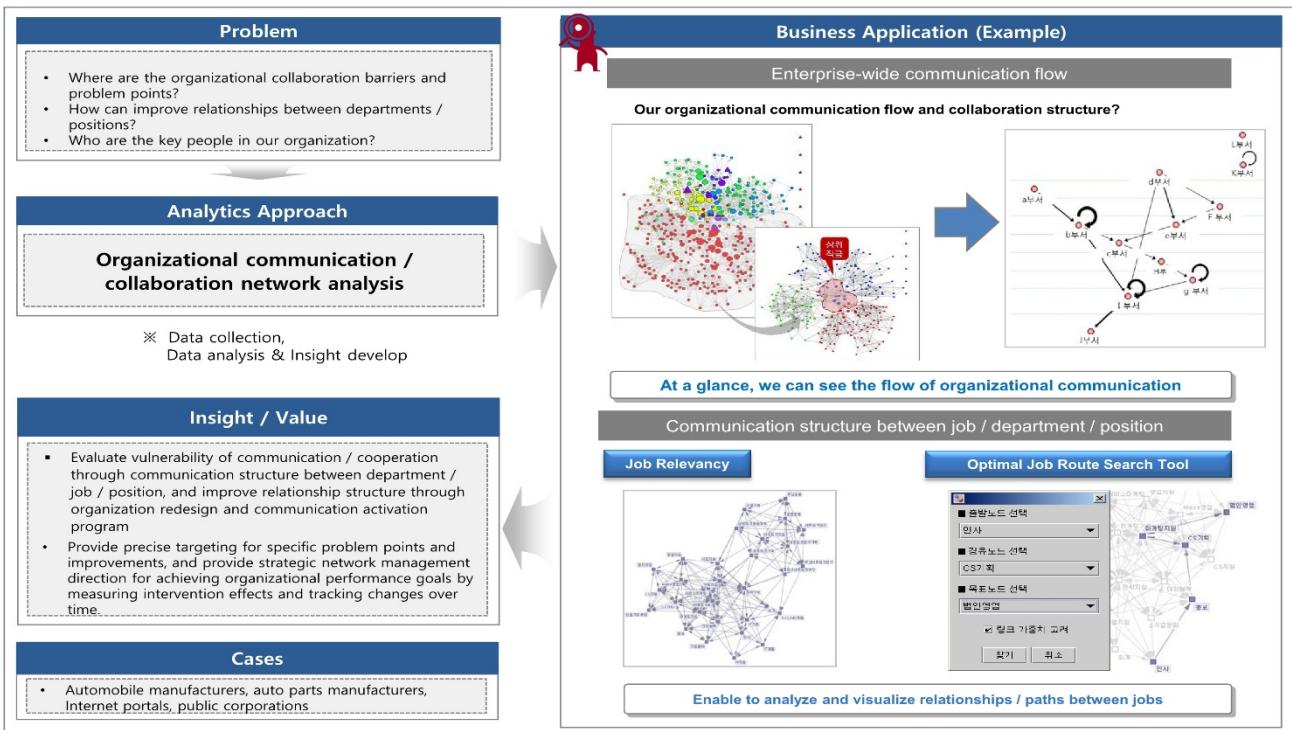
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Manage Employee Communication

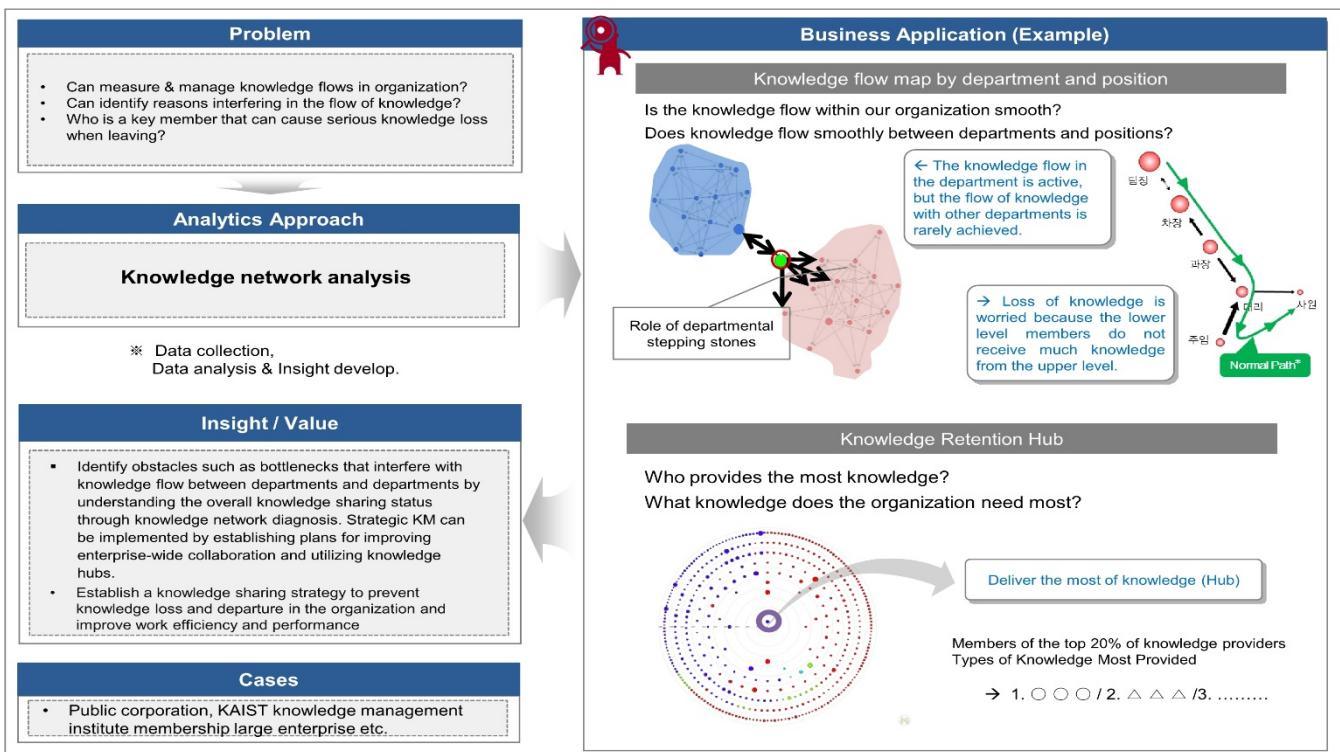


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Knowledge Flow Management / Tacit Knowledge Management



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Social Networking

Problem

- How to manage relationships with key external personnel that could affect the company's business activities?
- Who is the in-house employee who can be most closely connected to the external Key Person?
- Who are the main people who need strategic relationship management by sector?

Business Application (Example)

Strategic relationship management with Key Person

Corporate crisis management using external influencers

18대 의원 네트워크 조사

Analytics Approach

People Information Network Analysis

* Data analysis & Insight develop

Insight / Value

- Improving the company's sales activities and crisis management performance by appropriately using the influence of Key Person
- Improve your company's strategic network management efficiency

Cases

- Broadcasters, newspapers, national research institutes, secretariat offices of large corporations, etc.

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Anti-bullying

Problem

- How to know in advance who is at risk of being bullied?
- What can be done to resolve the bullying?
- Who is leading the class atmosphere??

Business Application (Example)

Social network analysis based peer relationship network analysis

Relationship-type questionnaire

Identify students at risk of bullying that were difficult to detect by humanity testing

Multilayer Relationship Investigation

Identify types of peer relationships and analyze the risk groups

Identify the risk of bullying and suggest that teachers and counselors be interested

Analytics Approach

Friend relationship network analysis (CYLINCS®)

* Data collection
Data analysis & Insight develop

Insight / Value

- Conversion of perceived bullying as a matter of relationship rather than individual problem
- Identify students who are likely to be in an alienation crisis through relationships among students and prevent bullying
- Identify patterns of bullying risk groups and present healing programs appropriate for each feature

Cases

- 136 schools, 28,000 students diagnosed (as of December 2016)

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Cyram



Cyram

- Cyram has been the pioneer who has developed the SNA technology and the market for 17 years since established in 2000.
- NetMiner has gained a reputation as one of the best and most representative SNA tools since its global launch in 2001.
- In the Korean market, we have provided analysis consulting services and system solutions in areas such as customer behavior analysis, criminal investigation, fraud detection, organization diagnosis, knowledge discovery, social media analysis, bulletin detection, and academic research.

“Cyram is one of the few companies with a presence in this market for around a decade”

- “Market Guide for SNA” released by Gartner on July 30, 2015

Soon-Man Hong

Co-CEO

- Bachelor of Aeronautical Engineering in Seoul National University
- MBA in Helsinki Univ.
- IBM-Korea, Compaq-Korea
- HP-Korea Country manager of Sybase-Korea
- Vice President in Hanaro Telecom Co.



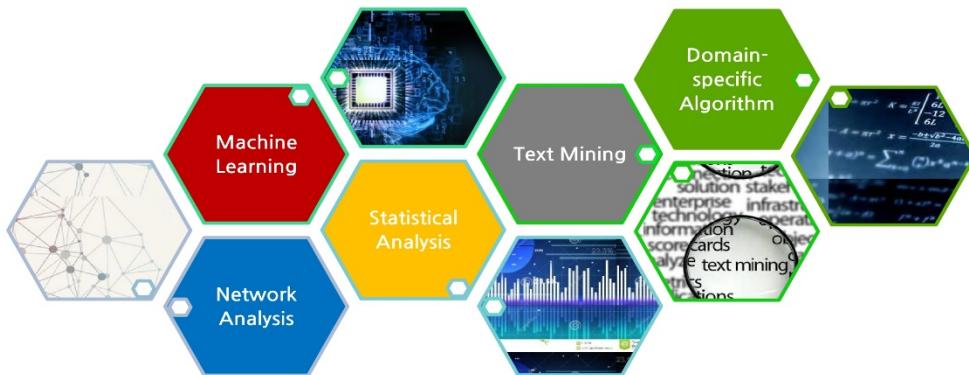
Ghi-hoon Kim

CEO/Founder of Cyram

- Bachelor of Economics, Seoul National University
- Master of Sociology, Seoul National University
- PhD candidate of Sociology in Seoul National University
- Director of Digital Media Department, National Information Society Agency, an affiliated organization of the Ministry of Information and Communication

Core Technology

Cyram has more than 200 sets of data analytic algorithm relating to SNA, Machine Learning, Text Mining and Statistics .



IBCT JSC



IBCT JSC

- IBCT JSC has been the first software engineering & consulting center in Hanoi with global leading technology providers since established in 2013.
- Since 2013, IBCT has collaborated with global software & consulting teams in Korea, Japan and America.
- IBCT has been collaborated with core technologies such as big data analysis / cloud service / intelligent decision support robot including mobile platforms.

**"IBCT is the software engineering center & consulting company
for IT related businesses in Hanoi Vietnam."**

Kwang Seek Jeong

Co-Founder CEO

- Bachelor of Mechanical Engineering in Pusan National University
- LG Electronics.
- President of I-Consultant, Korea

Ja Young Cho

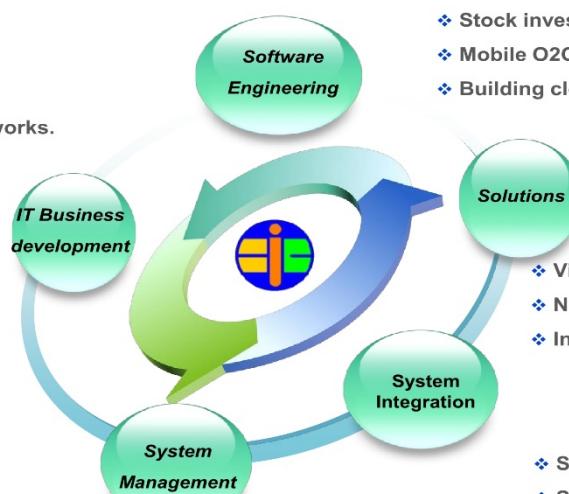
CEO/Co-Founder of IBCT

- Bachelor of Electronics majoring Computer Engineering in KyoungBuk National University
- MBA of MIS in SeoGang University.
- LG Electronics, IBM Korea
- Senior director of DaeHong Tech, Uniwide Technology.
- CEO of IBCT & Senior advisor of VKFA of Hanoi city government.



IBCT JSC

- ❖ Market Survey
- ❖ Promotion.
- ❖ Establish Business Networks.
- ❖ Business Consulting.
- ❖ Incubating startups



- ❖ SNA for Big Data.
- ❖ Stock investment DSS robot.
- ❖ Mobile O2O apps based on UC.
- ❖ Building cloud platforms.

- ❖ VideoOffice : Web Conferencing System.
- ❖ NetMiner – Big data analysis.
- ❖ Information Security platform.

- ❖ Software System Integration.
- ❖ Software localization.
- ❖ Business development.



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Let's Enjoy with IBCT !

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. 사이람

Invited Talk

▪ Preparing for the 4th Industrial Revolution

Prof. Dr. Sang-Goo Lee

Big Data Institute

Department of Computer Science and Engineering

Seoul National University (SNU), Seoul, Korea

The Fourth Industrial Revolution is many things to many people. Some see it as digital transformation of the manufacturing industry, while others define it as artificial intelligence taking over human labor. As I see it, the essence of this revolutionary transformation is the convergence of the cyber space (the network of computers) with the physical space (the reality), where software can effectively affect reality. In this software-enabled reality, new business ideas can be implemented, tested, and scaled with only a fraction of efforts required in conventional environments; thus accelerating the pace of change. Companies in every industry are scrambling to hire talents that can imagine and implement these ideas for themselves. However, the current university structures of siloed departments are incapable of producing such talents, neither qualitatively nor quantitatively.

The SNU Big Data Institute has been working hard to fill this gap. We are actively promoting (big) data inspired inter-disciplinary research where data acts as the concrete medium for collaboration. Through its educational programs, the institute strives to meet some of the demands of the industry by providing big data and A.I. education to non-engineers.

Sang-goo Lee is a professor of Computer Science & Engineering at Seoul National University (SNU), Seoul, Korea. He is also the Associate Director of SNU Big Data Institute, which he co-founded in 2014. His research interests are in context-aware personalization, natural language processing, and application of A.I. to business problems. The Korean language parser KKMA, which he developed with his students, is one of the most widely used parser in industry. An active advocate of blended learning, he has won the SNU Teaching Award in 2016 for his innovative use of ‘flipped learning’ in computer science courses.

In the past, Sang-goo Lee has served as the Dean of IST and Chief Information Officer of SNU, and also as the Head of Korea Education Network, an Internet coalition of more than 400 universities/colleges in Korea. He has been active in organizing international conferences; Founder and General Chair of the International Workshop on Data Engineering Issues in E-Commerce and Services (DEECS) since 2005, Workshop Chair for VLDB 2006, PC Chair for DASFAA 2012, Vice General Chair for WWW 2014, and Vice General Chair for IEEE ICDE 2015.

ICIDB 2018

Preparing for the 4th Industrial Revolution

2018. 01.

Sang-goo Lee

Department of Computer Science and Engineering
Seoul National University



Four Industrial Revolutions



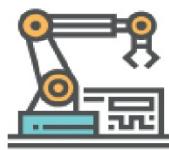
1st Industrial Revolution WATER & STEAM

Steam and water power replace human and animal power with machines.



2nd Industrial Revolution ELECTRICITY

Electricity, internal combustion engines, airplanes, telephones, cars, radio, and mass production.



3rd Industrial Revolution AUTOMATION

Electronics, the internet and IT used to further the automation of mass production.



4th Industrial Revolution CYBER-PHYSICAL SYSTEMS

Driverless cars, smart robotics, materials that are lighter and tougher, and a manufacturing process built around 3D printing.

[by Tanmoy Ray at Study Abroad, 2017]

The Fourth Industrial Revolutions



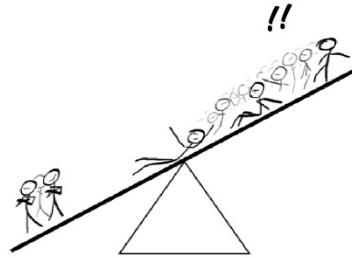
SW-driven / SW-controlled Everything

- The essence
 - Convergence of the cyber space and the physical space => *Smart Reality*
 - An environment where anything and everything can and will be controlled/automated by software
- Consequences
 - *Implement anything imagined*
- applications/services/business
 - *Infinite scalability*
 - *Zero-cost experiment & prototyping*
 - *Accelerated innovations*



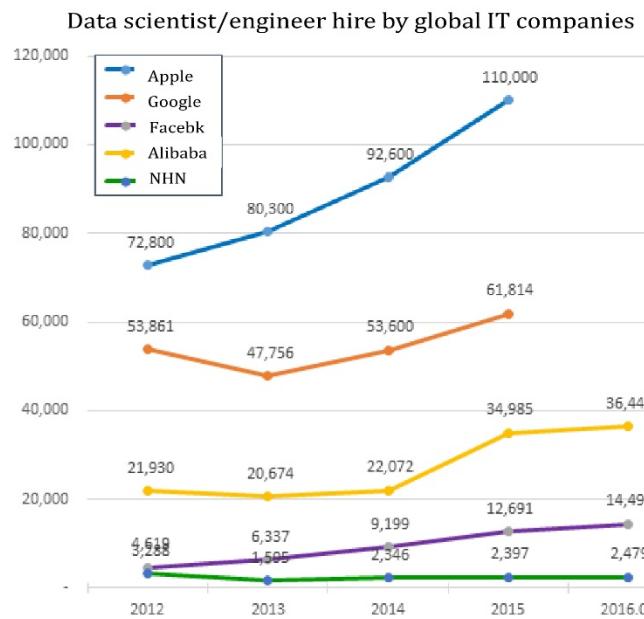
Technical Drivers

- **AI (Machine Learning & Deep Learning):**
 - Extend the scope of functions that can be automated
- **Cloud (Computing Resource):**
 - Lower entry barriers
- **IoT (Sensors/Actuators) & CPS:**
 - Connect the two worlds
- **Communications (Super Connectivity):**
 - Ubiquitous connection
- **Big Data (Logs/Documents/Streams):**
 - The glue and the fuel!!



People!

- "Germany changes course for its Industry 4.0 due to shortage of experts" (Donga Daily, 2016. 09. 26)
- "Korean Big Data Market to Soar, Pushing Demand for Talents 22 Folds by 2018"(연합뉴스 2016.07.22)



What kind of people?

▪ Software engineers

- Software developer jobs are expected to grow 17% from 2014 till 2024. - U.S. Bureau of Labor Statistics

▪ Data scientists/engineers

- “A data scientist is someone who is better at statistics than any software engineer and better at software engineering than any statistician.”

▪ Machine learning engineers

- There are fewer than 10,000 qualified people in the world and universities are only graduating about 100 new candidates each year with the requisite skills. - NYTimes

▪ Creative thinkers/doers

- Formulate the problem
- Devise a solution
- Implement a prototype
- Test/Verify and loop



- 7 -



Universities are not up to the challenge

“College is a place where a professor’s lecture notes go straight to the student’s lecture notes, without passing through the brains of either”

– Mark Twain

THE CHRONICLE OF HIGHER EDUCATION

SECTIONS

FEATURED: Admissions Confidential Chapel Hill's New Civil War The Future of Work

SPECIAL REPORTS

f t e p

Are Colleges' Diversity Efforts Putting Students in 'Silos'?

By Sarah Brown | MAY 15, 2016 • PREMIUM CONTENT FOR SUBSCRIBERS. [SUBSCRIBE TODAY](#)

Student-life officials stress that designated cultural spaces play a vital role in making campuses inclusive. But, they say, colleges must also build places where diverse students can have difficult conversations.



Breaking Down the Silos in Student-Learning Research

As universities investigate how students learn, they're working through some challenges with the current system that conducts research in disciplinary silos including psychology, neuroscience and economics.

BY TANYA ROSCORLA / FEBRUARY 19, 2016

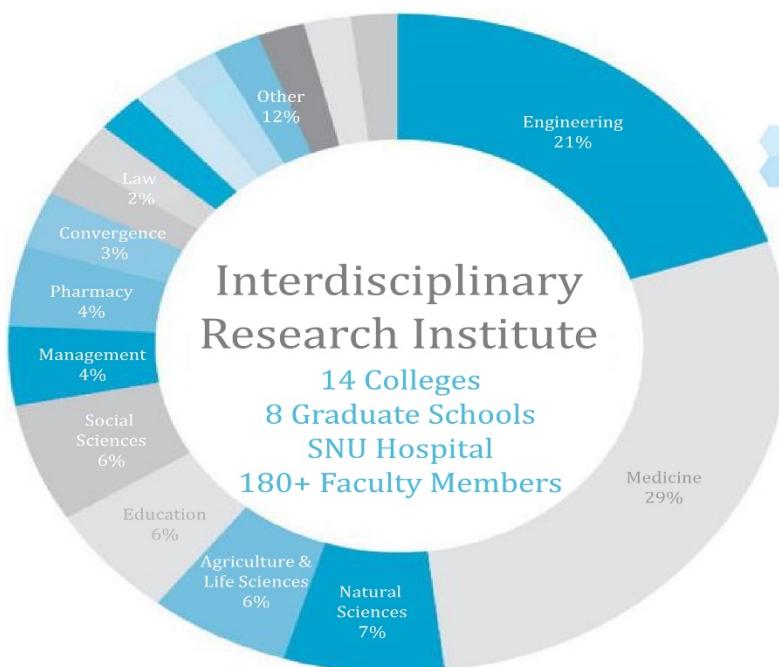
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SNU Big Data Institute



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Promoting Inter-Disciplinary Research

Sample Research Projects

Project Title	Principal Investigators
Development of a News and Social Media Monitoring System	Hyopil Shin (Linguistics) Kyu Sup Hahn (Communication)
Big Data-Driven Selection and Prediction Model for High-Risk and High-Cost Health, Medical and Welfare Groups	Jung Min Park (Social Welfare) Hongsoo Kim (Public Health)
Creating Consumer Value through Big Data: Focusing on the Analysis of Consumer Needs, Patterns, and Invasion of Privacy	Jong-Youn Rha (Consumer Science) Taekyoung Kwon (Comp. Sci. & Eng.)
Analysis of the Causes of Changes in Forest Ecosystems with Spatio-Temporal Big Data	Neung-Hwan Oh (Env. Planning) Hyun Seok Kim (Forest Sciences)
Development of a Presurgical Evaluation Technique to Identify the Epileptogenic Focus in Epilepsy with Large-Scale Electrophysiological Brain Signals	Chun Kee Chung (Brain and Cog. Sci.) Seung-Hyun Jin (SNU Hospital)
Construction of a CPR Network with Geographic Data	Sang Do Shin , Kyoung-Jun Song , Yu Jin Lee (Medicine)
The Structure and Function of Sports with Big Data Analytics: A Phylosystematic Approach	Heebal Kim (Biotechnology)

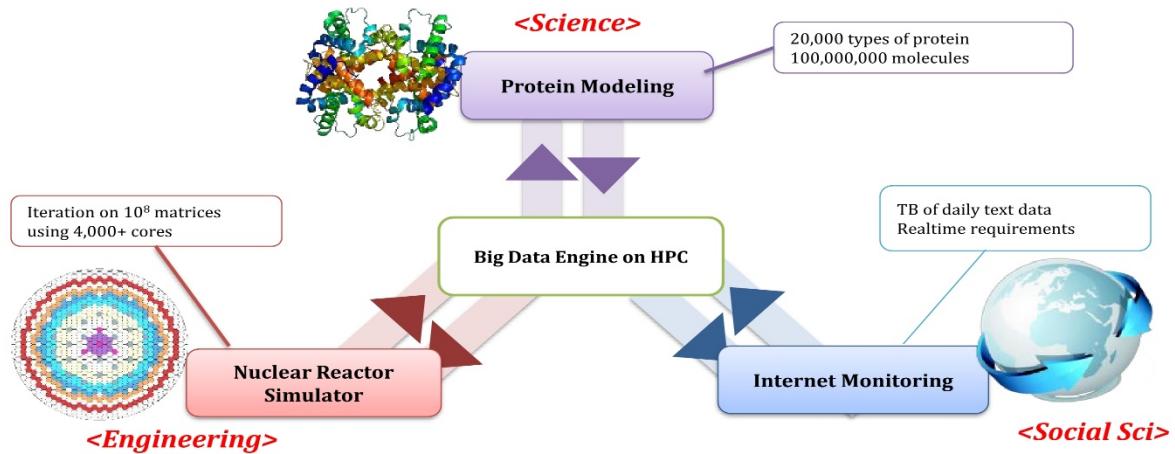


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Big Data on Supercomputers

- Big Data Big Computing (BDBC)
- 3 key applications requiring intensive computing on big data



BD/AI Training for Non-Engineers

Program	Hours	Trainees	Sub-Topics	Yearly	To Date	Faculty	Sponsor
Big Camp	40	SNU Grads Non-majors	Big Data Analytics Big Data Engineering	160	440	12	SNU
Big Data Academy	48	Corporate	Big Data Analytics Big Data Engineering	90	180	12	Individual
Big Data Classes for Citizens	80	Citizens of Seoul	Big Data Analytics Big Data Engineering	300	300	10	City of Seoul
4th Indust. Rev. Academy	1,000	Non Majors	AI & Agents Big Data Platforms Big Data Analytics FinTech Intelligent Robots	120 ~ 180	90	30	Government
Intensive Data Science	400 ~ 800	Corporate	Big Data Analytics Big Data Engineering AI & ML	100	160	20	Corporate

SNU FIRA

- **3 Programs (30 students each)**
 - AI & Agent / Big Data Engineering / Business Analytics
- **8 months (6/12 ~ 2/20) 1,000 hours**
 - 3 * 8 week modules * 3 courses
 - 12 week capstone project



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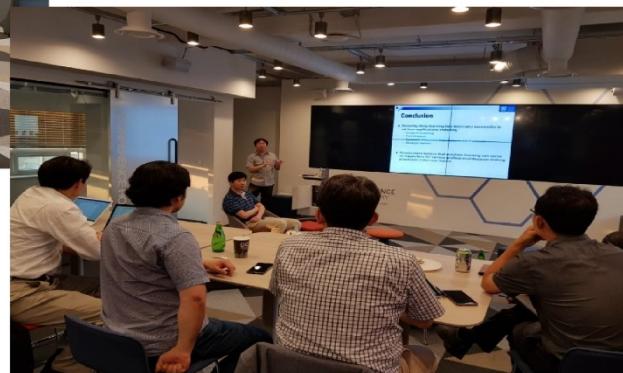
SNU Big Camp!

- **Graduate Students – all majors**
 - 40 hours
- **Analytics program**
 - Marketing Analytics / Text Analytics / Info. Vis. / Statistics
- **Engineering program**
 - Machine Learning / Deep Learning / Info. Vis. / Spark



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Deep Learning Tutorial for Faculty Members

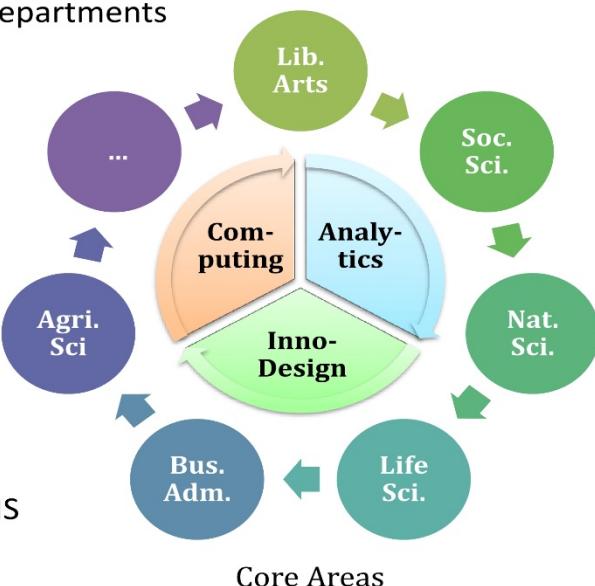


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IDS Lab.

Grad School of Data Science and Innovation

- Anti-Disciplinary Education and Research
 - Joint faculty appointments with all departments
 - Open to all majors
- 4 Core Areas
 - Computing
 - Analytics
 - Innovation
 - Specialization
- Career path
 - Industry / Academia
 - Return to PhD of orig. discip. after MS
 - Dual degrees (Masters)



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IDS Lab.

Presentation Session 1-1

Multimedia Signal Processing

Session Chair: Dr. Phan Xuan Vu

1. The Impact of Each Deep Neural Network Layer on the Performance of End-To-End Vietnamese Speech Recognition
 - Nguyen Hong Quang
2. BLE Beacon based Audible Pedestrian Signal for the Visual Impaired Pedestrians
 - Juwan Kim, Jungsook Kim, Sangheon Park, Bongjin Oh, Hyoungsun Kim
3. Video-Based Face Recognition using Shape and Texture Information in 3D Morphable Model
 - Khoa Tan Truong, Thai Hoang Le
4. Automated 3D Reconstruction from an Outline Image of the Buddhist Stupa with Round Ground Plan
 - Ratchadaporn Kanawong
5. A Novel Proposal of Adaptive Bat Algorithm for Cooperative Spectrum Sensing
 - Viet Tuyen Nguyen, Kim Vo, Hai Duong Nguyen, Manh Kha Hoang
6. Camera Pose-Independent Action Recognition in Operating Room
 - Dinh Tuan Tran, Hirotake Yamazoe, Joo-Ho Lee

THE IMPACT OF EACH DEEP NEURAL NETWORK LAYER ON THE PERFORMANCE OF END-TO-END VIETNAMESE SPEECH RECOGNITION

Nguyen Hong Quang

School of Information and Communication Technology
Hanoi University of Science and Technology
Hanoi, Vietnam

Abstract

In this paper, we analyze the impact of each Deep Neural Network (DNN) layer on the performance of end-to-end Vietnamese speech recognition using 1D-Convolution layers and Bi-directional Gated recurrent unit (GRU) layers. In the first experiment, we use Spectrogram, Fully Connected (FC) and Connectionist Temporal Classification (CTC) layer to test the Vietnamese Digit speech. In the next two experiments, we use the three above layers added with 1D-Convolution Layers and GRU Layers. The result of the three experiments show that for Vietnamese speech recognition, 1D-convolution and Bi-directional GRU layers are the most effective choice for DNN.

Keywords :

End-to-End Speech Recognition, Neural Network.

Acknowledgment

We gratefully acknowledge the support of NVIDIA Corporation with the donation of the Titan Xp GPU used for this research.

BLE beacon based Audible Pedestrian Signal for the Visual Impaired Pedestrians

**Juwan Kim, Jungsook Kim Sangheon Park, Bongjin Oh,
Hyoungsun Kim**

IoT Research Division,
Hyper-connected Communication Research Laboratory
ETRI, Korea

Abstract

Audible Pedestrian Signal (APS) is an auxiliary apparatus to provide the location of a crosswalk and status information about pedestrian signals by non-visual formats such as audible tones and verbal messages. A pedestrian who is blind or has low vision uses a 358Mhz wireless switch in order to activate the APS. The existing APS can only receive an activation message from the wireless switch. Therefore, all APSs within the communication range of the wireless switch are activated simultaneously. It can cause noise problems and confuse the visual impaired pedestrians.

In this paper, we present a Bluetooth Low Energy (BLE) beacon based APS that can enable two-way communication via Bluetooth with a smartphone in order to solve this problem. It allows the visual impaired pedestrians to cross the street at signalized intersections more conveniently and safely.

Keywords :

BLE, Bluetooth, Audible Pedestrian Signal, Visual Impaired Pedestrian, IoT

Acknowledgment

This research was supported by a grant (Research Project ID: 17TLRP-B079209-04) from Transportation & Logistics Research Program funded by Ministry of Land, Infrastructure and Transport of the Republic of Korea.

VIDEO-BASED FACE RECOGNITION USING SHAPE AND TEXTURE INFORMATION IN 3D MORPHABLE MODEL

Khoa Tan Truong, Thai Hoang Le

Department of Computer Science, University of Science, Ho Chi Minh City, VNU-HCM, Vietnam
truongtankhoa1190@gmail.com, lhthai@fit.hcmus.edu.vn

Abstract

In this paper, a novel approach, based on combining 3D Morphable Face Models (3DMM) to shape vector and texture variance, is proposed for face recognition in video (called 3DMM-S-TV). In detail, the system fits a face video to a 3DMM, then utilizes shape fitting coefficients and texture info to recognize face. For this purpose: (1) apply 3DMM to reconstruct 3D face; (2) form a shape vector to present each face in video; (3) calculate texture variance of each face; (4) use shape vector to estimate a face gallery in training data similar to faces in test data; (5) use minimum texture variance to identify objects from the gallery. Proposed methods are evaluated on two face video databases (YouTube Celebrities and FAMED).

Keywords :

Face Recognition using 3DMM, 3D Face Recognition

AUTOMATED 3D RECONSTRUCTION FROM AN OUTLINE IMAGE OF THE BUDDHIST STUPA WITH ROUND GROUND PLAN

Ratchadaporn Kanawong

Department of Computing, Faculty of Science,
Silpakorn University, Sanamchandra Palace Campus,
Nakorn Pharathom, Thailand

Abstract

Temple is a Buddhist place which is consist of many buildings. The remarkable building is Stupa. In Thailand, stupas, known as Siamese phra chedi, are reliquaries or memorial buildings. Buddhist stupa has the unique shape: symmetric and round. When people look at sketches of stupa, they can image three dimensional (3D) model of stupa. This paper proposed the method to automatically construct the 3D model of stupa from a 2D image for only the round ground plan of phra chedi. There are 3 steps; the first step is finding vertical symmetric axis of stupa. Next is determining landmarks on the boundary of stupa both side of the vertical sym-metric axis. The last one is surface reconstruction. This paper evaluate output by comparing to the model created by the expert, the ratio between the mean error and the largest radius of stupa's base is 4.08%.

Keywords :

Buddhist stupa, 3d model, Reconstruction, Architecture

Acknowledgment

I thank Preeyaporn Pimsawas and Phatorn Ponwong for their assistance in data acquisition and cleaning. Pinyo Taeprasartsit give me a valuable suggestion.

A NOVEL PROPOSAL OF ADAPTIVE BAT ALGORITHM FOR COOPERATIVE SPECTRUM SENSING

Viet Tuyen Nguyen¹, Kim Vo², Hai Duong Nguyen² and Manh Kha Hoang¹

¹ Faculty of Electronics Engineering, Hanoi University of Industry, Vietnam

² Faculty of Radio Electronics Engineering, Le Quy Don Technical University, Vietnam

Abstract

In cognitive radio networks, spectrum sensing is a key functionality to enhance the spectrum efficiency. This paper proposes an adaptive bat algorithm with respect to number of secondary users to optimize weight vectors by maximizing the probability of detection. The simulation results demonstrate that the proposed method outperforms the traditional bat algorithm method in term of convergence speed.

Keywords :

Cognitive Radio, Spectrum Sensing, Bat Algorithm.

Camera Pose-Independent Action Recognition in Operating Room

Dinh Tuan Tran, Hirotake Yamazoe and Joo-Ho Lee

Graduate School of Information Science and Engineering
Ritsumeikan University
Japan

Abstract

Action recognition is a research topic of interest in computer vision and machine learning by the promise of many applications. This topic is still challenging due to some problems, such as environmental change and camera pose variation. In this paper, we present an action recognition method to overcome these problems. Proposed method introduces a new camera pose-independent motion feature which includes binary ORB (oriented FAST and rotated BRIEF) feature and rotated-normalized optical flow feature extracted at the position of ORB keypoint. Obtained features in each action video are then learned by latent Dirichlet allocation topic model to give action label for that video. We validate our method by conducting experiments in a Unity3D simulation of the operating room.

Keywords :

Computer Vision, Machine Learning, Action Recognition, Operation Room

Acknowledgment

This work was supported by Otsuka Toshimi Scholarship Foundation, 2017-2018.

Presentation Session 1-2

Communication System and Technology

Session Chair: Dr. Nguyen Thanh Chuyen

1. Pi-based Speed Controller for Vector Control Model of the Induction Motor Drive Using GA Tuned Fuzzy Algorithm
 - Thinh Cong Tran, Pavel Brandstetter, Hau Huu Vo, Cuong Dinh Tran, Sang Dang Ho
2. Item-based Collaborative Filtering in the Multi-Criteria Recommender System with Ordered Weighted Averaging Operator on Sparse Datasets
 - Tri Minh Huynh, Vu The Tran, Hung Huu Huynh, Hiep Xuan Huynh
3. Research on Seasonal Arima Model and Predict the Number of Listeners of the Song
 - Nguyen Dinh Thuan, Nguyen Thanh Quan
4. Cooperative Noma for Downlink D2D with Best Relay Selection: Outage Performance Analysis
 - Huu-Phuc Dang, Ngoc-Long Nguyen, Minh Sang Van-Nguyen, Nguyen Thi Tu Trinh, Dinh Thuan-Do
5. Performance Measurement Model: In University Performance Achievement
 - Eisy Humaira Abdul Azziz, Zeratul Izzah Mohd Yusoh, Azah Kamilah Muda
6. Incorporating Fuzzy Set into Dempster-Shafer Theory for Decision Fusion
 - Somnuek Surathong, Sansanee Auephanwiriyakul, Nipon Theera-Umpon

PI-based Speed Controller for Vector Control Model of the Induction Motor Drive using GA tuned Fuzzy algorithm

Thinh Cong Tran^{1,2}, Pavel Brandstetter², Hau Huu Vo¹, Cuong Dinh Tran¹, Sang Dang Ho¹

¹ Faculty of Electrical and Electronics Engineering, Ton Duc Thang University, Vietnam
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² Faculty of Electrical Engineering and Computer Science, VSB-Technical University of Ostrava, Czech Republic
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²pavel.brandstetter@vsb.cz

Abstract

The paper describes an application of the fuzzy algorithm on Proportional-Integral (PI) speed controller, then the coefficients of the controlled system is optimized by Genetic Algorithm (GA) to find optimal parameters K_p , K_i for the PI speed controller in the controlled structure of the A.C. drive with the vector controlled. An induction motor model with the PI speed controller is presented in the first section. The second part describes the design of the online PI-fuzzy speed controller and GA tuned for coefficients of system. Finally, the important simulations with the traditional PI speed controller and the online PI-fuzzy speed controller using the tuned genetic algorithm together with change of parameters were performed in the Matlab-Simulink environment. The simulation results show that the online PI-fuzzy speed controller with the tuned GA produces a much better response of the induction motor speed.

Keywords :

Induction Motor, Drive, Vector Control, PI-Fuzzy Speed Controller, Online, Genetic Algorithm, Optimal.

Acknowledgement

The paper was supported by the projects: Center for Intelligent Drives and Advanced Machine Control (CIDAM) project, reg. no. TE02000103 funded by the Technology Agency of the Czech Republic, project reg. no. SP2018/162 funded by the Student Grant Competition of VSB-Technical University of Ostrava.

ITEM-BASED COLLABORATIVE FILTERING IN THE MULTI-CRITERIA RECOMMENDER SYSTEM WITH ORDERED WEIGHTED AVERAGING OPERATOR ON SPARSE DATASETS

**Tri Minh Huynh¹ and Vu The Trần² and Hung Huu Huynh³
and Hiep Xuan Huynh⁴**

¹ Kien Giang University, Viet Nam

^{2,3} University of Science and Technology, Da Nang University, Viet Nam

⁴ Can Tho University, Viet Nam

Abstract

At present, the demand for consulting for users is increasing with diverse information. Multi-criteria Recommender system is one of the research goals of scientists that are great interest. Many recommender methods are designed to find the most valuable products or services that suggest to user are consulted best. Selecting a suitable solution for recommendation on data storage will response well the requirements of the users. In this paper, we propose a new approach to building multi-criteria recommender model that interacts based on items-based collaborative filtering using the ordered weighted average operator on sparse datasets. This model demonstrates the coherence and impact of user criteria in decision-making. The model was evaluated empirically on the multirecsys tool on three datasets: MovieLense 100K, MSWeb and Jester5k. The experiment also illustrates the comparison with some other researched methods that applied. Consultancy results of the proposed model are quite effective compared to some traditional consulting models. This counseling model can be applied well in a variety of contexts. Especially, in the case of sparse data, the counseling results of the proposed model are seem always better than the exiting models (Item-based).

Keywords :

Multi-Criteria Recommender System, Item-Based Collaborative Filtering.

RESEARCH ON SEASONAL ARIMA MODEL AND PREDICT THE NUMBER OF LISTENERS OF THE SONG

Nguyen Dinh Thuan¹, Nguyen Thanh Quan²

^{1, 2} Department of Information Systems, University of Information Technology, VNU-HCM, Vietnam,

Abstract

The goal of the research focuses on retrieving information from music online website to get the data of the songs with many fields: cover, title, artist, ect. Beside that, we can know about listening music habit of online users based on the statistic chart which show the listener of the song each day per week. Moreover, this topic has researched time series and seasonal ARIMA (AutoRegressive Integrated Moving Average) model to analyze and predict the number of listeners of the song. Decisions that involve the factor of uncertainty of the future, time series models have been found one of the effective methods of forecasting.

Keywords :

Music Information Retrieval, Arima, Song Prediction.

COOPERATIVE NOMA FOR DOWNLINK D2D WITH BEST RELAY SELECTION: OUTAGE PERFORMANCE ANALYSIS

**Huu-Phuc Dang¹, Long Nguyen Ngoc², Minh Sang Van-Nguyen³, Nguyen Thi Tu
Trinh³, Dinh Thuan-Do³, Miroslav Voznak²**

¹HCMC University of Technology and Education, 1 Vo Van Ngan Street, Linh Chieu Ward, Thu Duc District, Ho Chi Minh City, Vietnam.

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³ Industrial University of Ho Chi Minh City, 12 Nguyen Van Bao, Ho Chi Minh City, Vietnam. Email: dodinhthuan@iu.edu.vn; nguyenvanminhsang1995@gmail.com

Abstract

In this paper, cooperative non-orthogonal multiple access (NOMA) helps device-to-device (D2D) communication in the downlink. In particular, we investigate relay selection scheme as best channel condition for dedicated users where a different data transmission demand on each user. In particular, the outage probability of both users is investigated, and several impacts on system performance are presented. By simulation implementation, the proposed D2D- NOMA system introduce expected performance on reasonable selected parameters in the moderate signal to noise ratio regime.

Keywords :

D2D, NOMA, Relay selection

PERFORMANCE MEASUREMENT MODEL: IN UNIVERSITY PERFORMANCE ACHIEVEMENT

Eisy Humaira Abdul Azziz, Zeratul Izzah Mohd Yusoh and Azah Kamilah Muda

Computational Intelligence and Technology Research Laboratory, CIT

Faculty of Information & Communication Technology,

Universiti Teknikal Malaysia Melaka,

Melaka, Malaysia

Abstract

Most universities nowadays have put more emphasis in improving their ranking in ranking lists as provided by several prominent agencies. However, there is a lack of system that able to measure the university's performance in relation to the ranking criteria and this has led to inaccurate strategic planning by the university. This paper aims to develop a model able to help the university in measuring their performance. In order to get a better understanding on performance measurement, some related researches were reviewed. In addition, proposed model are included as the main result of this research at this stage.

Keywords :

Performance Measurement Model, University Performance.

Acknowledgment

The authors would like to express their gratitude to Universiti Teknikal Malaysia Melaka (UTeM) for the support. This research is part of Master of Information and Communication Technology and funded by UTeM under grant PJP/2016/FTMK/HI3/S01473.

INCORPORATING FUZZY SET INTO DEMPSTER-SHAFER THEORY FOR DECISION FUSION

Somnuek Surathong^{1,2}, Sansanee Auephanwiriyakul^{1,4}, Senior Member, IEEE, and Nipon Theera-Umpon^{3,4}, Senior Member, IEEE

¹ Department of Computer Engineering, Faculty of Engineering,
Chiang Mai University, Chiang Mai, Thailand

² Graduate School, Chiang Mai University, Chiang Mai, Thailand

³ Department of Electrical Engineering, Faculty of Engineering,
Chiang Mai University, Chiang Mai, Thailand

⁴ Biomedical Engineering Institute, Chiang Mai University, Chiang Mai, Thailand

Abstract

Decision fusion is one of the popular methods in the classification research area. The Dempster's rule of combination is one of the decision fusion methods used frequently in many research areas. However, there are so many uncertainties in classifier output. Hence, we introduce a fuzzy Dempster's rule of combination where we fuzzify the basic probability assignment and compute the fuzzy combination. We run the experiment with 4 classifiers, i.e., linear discriminant analysis, k-nearest neighbors, naive Bayes, and multilayer perceptron. Therefore, there are 6 combinations in the experiment. We compare our fusion result with that from the Dempster's rule of combination. All of our results are comparable or better than those from the Dempster's rule of combination.

Keywords :

Fuzzy Number, Dempster-Shafer Theory, Dempster's Rule of Combination, Fuzzy Belief, Fuzzy Basic Probability Assignment.

Presentation Session 1-3

Radio Frequency System and Devices

Session Chair: Dr. Bhanu Shrestha

1. Field Distribution of Partially Filled Waveguide with Anti- Isorefractive Material
 - Hoang Le Huu, Linh Ho Manh, Kiem Nguyen Khac, Chien Dao Ngoc
2. Improving Cloud System Performances by using Non-Volatile Memory
 - Jisun Kim, Hyokyung Bahn
3. 28/38 GHz Dual-Band MIMO Antenna with Low Mutual Coupling Using a Couple of DGS
 - Duong Thi Thanh Tu, Pham Dinh Son, Vu Van Yem
4. Full-Duplex DF Optimal Relay Selection Networks: Secure Performance Analysis
 - Thuy Dao Thi Thu, Quyet Nguyen, Dinh-Thuan Do
5. Model and Design of a Duplexer for LTE-A Transceiver with Hexagon Cylinder Cavities
 - Tran Thi Thu Huong, Nguyen Xuan Quyen, Vu Van Yem
6. Online Using Time Window Embedding Strategy in Green Network Virtualization
 - Tran Manh Nam, Nguyen Tien Manh, Truong Thu Huong, Nguyen Huu Thanh

Field distribution of partially filled waveguide with anti-isorefractive material

Hoang Le Huu¹, Linh Ho Manh¹, Kiem Nguyen Khac¹, Chien Dao Ngoc²

¹Hanoi University of Science and Technology

²Ministry of Science and Technology, Hanoi, Vietnam

Abstract

In recent years, research of anti-isorefractive material, so called left-handed metamaterial, has been receiving remarkable attention thanks to the fact varying their properties of permittivity and permeability can modify the field distribution in a waveguide or infinite bodies. In this paper, a partially filled waveguide is investigated. Computational method by separation of variables is employed in fundamental modes to obtain field distribution inside the structure. Exact solutions are obtained and electric density of partially filled waveguide is improved by changing waveguide dimension and material properties.

Keywords :

Filled Waveguide, Anti-Isorefractive Material

Acknowledgement

The authors gratefully acknowledge Hanoi University of Science and Technology by project fund number T2017-PC-112 and the supports from ACE Technology in the preparation of manuscripts.

IMPROVING CLOUD SYSTEM PERFORMANCES BY USING NON-VOLATILE MEMORY

Jisun Kim and Hyokyung Bahn

Department of Computer Engineering
Ewha University
Republic of Korea

Abstract

In this paper, we analyze the performance improvement of cloud systems by adopting non-volatile memory. Specifically, we present the optimized adoption of non-volatile memory for the storage of cloud systems. Our analysis shows that a bulk of storage accesses does not happen on a single storage partition, but it is varied significantly for different cloud applications. In particular, journal accesses dominate in database applications, whereas swap accesses dominate in memory-intensive applications. In some applications such as video streaming, file accesses dominate. Based on these observations, we recommend the usage of non-volatile memory for maximizing the performance gain in cloud systems.

Keywords :

Cloud System, Non-Volatile Memory, Storage System

Acknowledgment

This work was supported by the Basic Science Research program through the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIP) (No. 2016R1A2B4015750).

28/38 GHz DUAL-BAND MIMO ANTENNA WITH LOW MUTUAL COUPLING USING A COUPLE OF DGS

Duong Thi Thanh Tu^{1,2*}, Pham Dinh Son², and Vu Van Yem¹

¹Hanoi University of Science and Technology, Hanoi, Vietnam

²Posts and Telecommunications Institute of Technology, Hanoi, Vietnam

Abstract

In this paper, a design of dual-band Multiple Input Multiple Output (MIMO) antenna using a couple of novel Defected Ground Structure (DGS) is proposed. The antenna operates at 28 GHz and 38 GHz band for future fifth generation (5G) wireless technology. Combination of U and X shape on the ground, the suggested MIMO antenna has achieved not only multiband but also more compact size which is compared to theoretical microstrip antenna design. In addition, the MIMO antenna achieves low mutual coupling for all operating wide bands at close distance of 4.8 mm thanks to proper position of DGS structure in antenna ground. The design of dual-band MIMO antenna is optimized and validated by CST-MW Studio using.

Keywords :

MIMO, DGS, Antenna, Mutual Coupling.

FULL-DUPLEX DF OPTIMAL RELAY SELECTION NETWORKS: SECURE PERFORMANCE ANALYSIS

Thuy Dao Thi Thu¹, Quyet Nguyen² and Dinh-Thuan Do^{1,*}

¹ Faculty of Electronics Technology, Industrial University of Ho Chi Minh City, Vietnam;

² Faculty of Electrical and Electronics Engineering, Ho Chi Minh City University of Technology and Education, Vietnam;

Abstract

In the existence of an eavesdropper, we study the secrecy outage probability (SOP) of the optimal relay selection (ORS) design by applying decode-and-forward (DnF) based on full-duplex relaying (FDR) mode. Our results reveal that the SOP of the suggested scheme can be considerably influenced on system performance by several parameters including the number of relays, the average signal-to-noise ratio (SNR) of eavesdropper links, transmit power and the average residual self-interference (SI) enforced on the relays.

Keywords :

Optimal Relay Selection; Secrecy Outage Probability; Full-Duplex.

MODEL AND DESIGN OF A DUPLEXER FOR LTE-A TRANSCEIVER WITH HEXAGON CYLINDER CAVITIES

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Hanoi University of Science and Technology
Viet Nam

Abstract

Multi input Multi output (MIMO) technology in Mobile network requires a Remote Radio Unit (RRU), which transmits and receives simultaneously many signal channels. So, the size of RRU must be minimized. This paper shows the researching to minimize the size of cavity resonator by changing the cavity shape. A hexagon cavity resonator is used to decrease the area of duplexer while ensures all required characteristics. A duplexer with eleven hexagon cavity resonators which operates at Band 3 is synthesized, designed and optimized by CST software. The simulation results archives all required characteristics, the area of duplexer can be reduced approximately to 10% as the rectangular cavity with the same topology. After designing, the final 3D model is built in AutoCad software and is fabricated. The measurement results are in a very good agreement with the simulation results.

Keywords :

LTE-A, Hexagon, Duplexer, Cavity Resonator.

Acknowledgment

The described research has received funding from the Ministry of Science and Technology of Vietnam, the Contract No. 43-16/ĐTDL.CN-CNC. This project.

ONLINE USING TIME WINDOW EMBEDDING STRATEGY IN GREEN NETWORK VIRTUALIZATION

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Abstract

Energy consumption, as well as carbon emission, from ICT is growing extremely. Such a growth trend needs to be facilitated by the creation of an energy-efficient and flexible network as an effort in developing the Future Internet. Recently, Network Virtualization (NV) have emerged as promising paradigm for data centers as the infrastructure for cloud computing. Network virtualization allows flexible sharing of physical network resources by multiple users. In a realistic NV context, virtual network requests come to the system continuously and dynamically, which affects the embedding efficiency. In this paper, we proposes a online time window-based embedding strategy which focuses on saving energy consumption of a network. The experimental results show that the proposed method works efficiently in both energy consumption and resource utilization.

Keywords :

Virtual Network Embedding, Energy Efficiency

Acknowledgment

This research is supported by the Office of Naval Research Global (Grant Number: N62909-17-1-2003).

Presentation Session 2-1

Wireless Communication & Networks

Session Chair: Dr. Nguyen Huu Thanh

1. Performance Evaluation of Optimal Foraging Approach for Dynamic Spectrum Reconfiguration in Cognitive Radio Networks
 - Oki O.A, Olwal T.O Mudali P, Adigun M.O.
2. A Multi-Criteria Priority-based V2I Communication for Information Dissemination at RSU in Vanet
 - Le Tran Duc, Olga Simonina, Mikhail Buinevich, Andrei Vladko
3. Interference Avoidance Algorithm for IEEE 802.15.4 based WPANs using 2.4GHz WLAN Frequency
 - Hyung-Whan Choi, Dong-Keun Jeon
4. Illumination Control System for Horticulture Based on Wireless Sensor Network
 - Aran Prakobsant, Rapeepong Rattanawaorahirankul
5. A Study of IoT Proxy for Interworking IETF CoAP and OCF IoTivity
 - Wenquan Jin, Do Hyeun Kim

PERFORMANCE EVALUATION OF OPTIMAL FORAGING APPROACH FOR DYNAMIC SPECTRUM RECONFIGURATION IN COGNITIVE RADIO NETWORKS

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²Department of Electrical Engineering, Tshwane University of Technology, South Africa

Abstract

The dynamic spectrum management techniques have been introduced to address the current radio frequency bands inefficiency challenges. Few research works have attempted to address the dynamic reconfiguration problems in spectrum management using various approaches. However, these existing approaches have not been able to achieve optimal solution due to certain challenges. Hence, why these existing approaches are not achieving optimal result and what other approach can be used to achieve optimal reconfiguration results are still open challenges that needs to be addressed. Therefore, this work highlight the challenges with existing approaches and presents a biologically-inspired optimal foraging model for dynamic reconfiguration in a distributed cognitive radio network. The proposed model results were compared with three existing models, using MATLAB simulation. The obtained results shows that the proposed foraging model outperformed dynamic strategy, Q-learning and game-based models in the achieved average channel switching time, network throughput, successful transmission probability and energy efficiency.

Keywords :

Biologically-Inspired, Cognitive Radio, Decision Making, Distributed, Foraging, Spectrum Reconfiguration.

A MULTI-CRITERIA PRIORITY-BASED V2I COMMUNICATION FOR INFORMATION DISSEMINATION AT RSU IN VANET

Le Tran Duc, Olga Simonina, Mikhail Buinevich, Andrei Vladko

The Bonch-Bruevich Saint-Petersburg State University of Telecommunications, Russia

Abstract

In vehicular networks (VANET), the priority of safety applications is always important. However, in many cases such as the priority of vehicle type in the green wave coordination or the time to leave coverage zone in Vehicle-to-Infrastructure (V2I) communication are also essential and should be considered. In this paper, we propose a multipolling mechanism for channel access for V2I communication based on a multi-criteria priority taking into account the priority of special vehicles. The simulation results show that the proposed mechanism can solve some inherent problems in VANET, reduce network delay and packet loss ratio.

Keywords :

VANET, V2I, Multipolling Mechanism, Priority-Based.

Acknowledgment

This research was financially supported by the Ministry of Education and Science of the Russian Federation in the framework of the Federal Target Program «Research and development on priority directions of scientific technological complex of Russia for 2014-2020» (the Agreement number 14.604.21.0165, unique identifier project RFMEFI60417X0165).

Interference Avoidance Algorithm for IEEE 802.15.4 based WPANs using 2.4GHz WLAN Frequency

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Abstract

The IEEE 802.15.4 standard is widely recognized as one of the most successful enabling technologies for short-range low rate wireless communications and used in IoT application. It covers all the details related to the MAC and PHY layers of the IoT protocol stack. Although IEEE 802.15.4 is a promising standard for IoT applications, it is vulnerable to interference caused by WLANs utilizing 2.4GHz ISM frequency band. Thus, interference is a critical issue to be consistently addressed for enabling a successful WPAN operation with co-existing WLANs. In this paper, we propose PAN coordinate controlled interference avoidance algorithm for IEEE 802.15.4 standard based WPANs using 2.4GHz WLAN frequency.

Keywords :

Interference Avoidance Algorithm, IoT Application.

Illumination Control System for Horticulture Based on Wireless Sensor Network

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Abstract

This paper presents an illumination control system for horticulture based on wireless sensor network. In this research, we want to design and control light-emitting diode (LED) lighting system by using buck converter circuit and microcontroller for red and blue LED. The wireless data are sent to the network by Zigbee wireless sensor for monitoring, controlling and processing at faraway places. The result shows that this research can control the illumination of LED for plant photosynthesis, and users can real time access the data via the precise wireless network. Furthermore, this research can reduce the electricity consumption rate more 35% than T5 fluorescent lamp.

Keywords :

Photosynthesis, LED, Zigbee.

A Study of IoT Proxy for Interworking IETF CoAP and OCF IoTivity

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Abstract

In IoT environment, heterogeneous sensors and actuators are connected with high performance computers such as cloud servers or local servers. Commonly servers and actuators work in constrained environments with limited computation. Recently several IoT standard frameworks have been published with heterogeneous protocols. For interworking between various protocols, we present an IoT proxy for interworking IETF CoAP and OCF IoTivity. An IoT proxy can connect between IETF CoAP and OCF IoTivity in IoT networks. In this paper, we have design IoT proxy server using .NET framework and IoT devices using android platform with IoTivity framework. The interworking proxy server have been developed to support CoAP and IoTivity to transfer data between IoT system and IoT devices.

Keywords :

IoT, Proxy, Interworking, CoAP, OCF, SOAP.

Presentation Session 2-2

Radio Frequency System and Devices

Session Chair: Dr. Vu Van Yem

1. Microstrip Bandstop Filters Design Using Meander Spurline Structure
 - Bhanu Shrestha
2. Deep Learning-Based Lip Analysis System
 - Jin Sol Choi, Daeyeol Kim, Sooyoung Cho, Chae-Bong Sohn
3. Microstrip Ultra-Wideband Bandstop Filter using Interdigital Capacitor
 - Chang-Soon Kim, Tae Hyeon Lee, Kwang Seob Shin, Bhanu Shrestha, Kwang Chul Son
4. A Triple Band Antenna using Dipole and Interdigital Structures
 - Tuanjai Archevapanich, Pongsathorn Chomtong, Vanvisa Chutchavong, Prayoot Akkaraekthalin
5. W-band Resistive Mixer Integrated Circuit with Broadband Performance in 0.15 μm GaAs pHEMT Technologies
 - Wonseok Choe, Jisu Choi, Keyongmok Ryu, Jinho Jeong

Microstrip Bandstop Filters Design Using Meander Spurline Structure

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Abstract

IN THIS PAPER, A MINIATURIZED MEANDER SPURLINE BANDSTOP FILTER WAS DESIGNED AND SIMULATED AT 7.1 GHZ. IT WAS DESIGNED ON TEFLON SUBSTRATE WITH DIELECTRIC CONSTANT OF 2.54 AND THICKNESS OF 0.54 MM. THE INSERTION LOSS IS LESS THAN 30 DB AND THE RETURN LOSS IS 0.03DB WERE OBTAINED IN THE SIMULATION RESULTS AS ITS S-PARAMETER RESPONSES. THE 3DB BANDWIDTH OF THE DESIGNED BSF WAS 2.65 GHZ WHICH WAS WIDE BANDWIDTH. THE ROLL OFF CHARACTERISTIC WAS ALSO EXCELLENT WHICH IS HIGHER THE BETTER PERFORMANCE OF THE DEVICE. THE OVERALL SIZE OF THE HAIRPIN RESONATOR FILTER IS 14.6 X 1.98 MM².

Keywords :

MICROSTRIP FILTER, MEANDER SPURLINE BSF, BANDSTOP FILTER, MEANDER LINE BSF.MICROSTRIP FILTER, MEANDER SPURLINE BSF, BANDSTOP FILTER, MEANDER LINE BSF.

Deep Learning-Based Lip Analysis System

Jin Sol Choi, Daeyeol Kim, Sooyoung Cho and Chae-Bong Sohn

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Abstract

Recent artificial intelligence manufactures based on voice recognition cannot be used by the deaf. In order to solve this problem, we present ‘Lip Analysis System’ using deep learning with lip movement. This system analyzes mouth shape and process time series data through the 3-dimensional convolution neural network and gated recurrent unit. Our Lip Analysis System deals with Korean vocabulary, and creates subtitles based on oral movements of the subjects in the video. This system recognizes individual words rather than the whole sentences. We achieved 91.8% accuracy. This system could be applicable for someone who being deaf, having the difficulty of hearing, or anyone who requires communication without the voice.

Keywords :

Artificial Intelligence, Deep Learning, Lip Analysis System.

Acknowledgment

This research was supported by the MSIT(Ministry of Science and ICT), Korea, under the ITRC(Information Technology Research Center) support program(IITP-2017-2016-0-00288) supervised by the IITP(Institute for Information & communications Technology Promotion

Microstrip Ultra-wideband Bandstop Filter Using Interdigital Capacitor

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¹Department of Holographic 3D contents, ²Department of Bio & Plasma Display, ³Department of Electronic Engineering, ⁴Department of Information and Contents,
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Abstract

In this paper, micro-strip ultra-wideband bandstop filter (BSF) using the Interdigital capacitor is suggested. The proposed UWB bandstop was designed which was based on stepped impedance resonators (SIRs) with interdigital capacitor. The designed BSF was composed of three SIRs with $\lambda/4$ length and the outer SIRs were modified into interdigital capacitor configuration to improve the device performance. The input and output ports were terminated to 50 Ohm for the system applications. The designed BSF was simulated using Sonnet simulation tool. The simulated results showed the insertion loss and return loss at center frequency of 6.1 GHz are 17 dB and 0.8 dB respectively. The 3dB bandwidth of the BSF was 4.4 GHz and physical the size of the BSF is 30 mm x 30 mm. The designed layout pattern and simulation result are shown in Figure 1.:

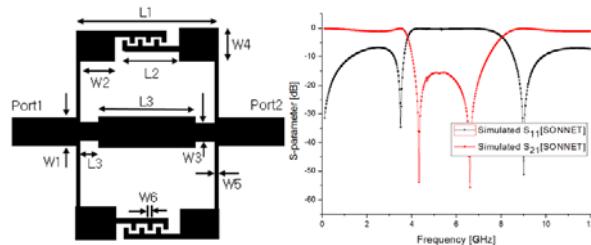


Figure 1. Designed pattern and simulation results.

Keywords :

Microstrip BSF, UWB BSF, Interdigital Capacitor.

The Effects of VR Simulation Game on Driving Fear and Efficacy

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School of Media Communication, Hallym University¹
South Korea

Abstract

The purpose of this study is to examine the effect of a virtual reality simulation game on driving fear, efficacy, and attitude. Experimental study was conducted on a total of 100 novice drivers who were university students. Results showed that the fear of driving decreased depending on gender and driving efficacy increased after playing a virtual reality driving game. This study has theoretical implication for the effect of virtual reality games.

Keywords :

Virtual Reality Game, Driving Fear, Driving Efficacy

Acknowledgment

This work was supported by the National Research Foundation of Korea Grant funded by the Korean Government (NRF-2015-S1A3-A2046760).

A TRIPLE BAND ANTENNA USING DIPOLE AND INTERDIGITAL STRUCTURES

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Abstract

This paper proposes a triple band antenna using interdigital technique based on a planar dipole structure. The antenna has been designed at the fundamental frequency of 1.8 GHz. With this proposed technique, the harmonic frequency bands of 2.45 and 5.2 can be created. The designed antenna can support various applications including indoor LTE, WLAN and wireless sensor base station systems. The simulation results of the antenna show superior characteristics in form of return loss and radiation pattern.

Keywords :

Dipole, Triple Band Antenna, Interdigital Structure, Wireless Application, Base Station Antenna.

Acknowledgment

This work has been supported by the Thailand Research Fund (TRF) under the Senior Research Scholar Program with the grant number RTA 6080008.

W-band Resistive Mixer Integrated Circuit with Broadband Performance in 0.15 μm GaAs pHEMT Technologies

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Abstract

In this paper, *W*-band (75-110 GHz) resistive mixer is designed using 0.15 μm GaAs pseudo-morphic high electron mobility transistor (pHEMT) process. In order to achieve wideband performance, the transistor size and bias conditions are carefully determined so that the transistor presents around 50 Ω at IF. In addition, coupled-line RF filter with a ring-resonator is utilized to provide broadband RF matching and IF open circuit which also improves the bandwidth performance. The designed resistive mixer was fabricated and measured at *W*-band, which shows a good agreement with the simulations.

Keywords :

Resistive Mixer, MMIC Design, RFIC Design.

Acknowledgment

This work was supported by Institute for Information & communications Technology Promotion(IITP) grant funded by the Korea government(MSIT) (No. B0717-16-0047, Development of ultra-wideband terahertz CW spectroscopic imaging systems based on electronic devices), and by Brain Korea 21 Plus Project in 2017.

Presentation Session 2-3

ICT Convergence

Session Chair: Dr. Nguyen Dinh Thuan

1. Cinematic Storytelling Game “Noah Ark”: Implementation and Design
 - Woo-Hyun Park, Yun-Gyung Cheong
2. SitBuCE: A Small Data-Driven Generalization Strategy for Technology Maturity Status Mapping
 - Adigun M.O, Kabanda S.K, Thinyane M
3. An Efficient Conversion Approach of the Bangla Infinite Verb Sentence into UNL
 - Md. Nawab Yousuf Ali, Golam Sorwar, Md. Shamsujjoha
4. The Structural Influences of Suicide-related Keywords Search on Suicide Rate in Korea
 - Hye-Ryeon Young, Ha Na Kang, Ghee-Young Noh, Hyun-Seok Hwang
5. A Novel Similarity Measure for Trace Clustering Based on Normalized Google Distance
 - Hong-Nhung BUI, Quang-Thuy HA, Tri-Thanh NGUYEN
6. Factors Affecting Social-Presence and Self-Presence in Virtual Reality Media
 - Sang-Min Park, Min-Ji Choe, Jeong-Min Park, Ghee-Young Noh

Cinematic Storytelling Game “Noah Ark”: Implementation and Design

WOO-HYUN PARK, YUN-GYUNG CHEONG*

College of Information & Communication Engineering,

*College of Software,

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Abstract

The game graphics will further enhance animation and film genres and provide users with a variety of emotions. Above all, Cinematic based on game graphics will be important. Cinematic expression in games is a technique that gives you the illusion of animation or movies as you play games. Game like the world-famous ‘Tomb Raider’ is a game that implements Cinematic story and is being loved for many people for a long time. In Korea, however, there are few attempts to associate the game with Cinematic. According to this, we suggest combining game with storytelling based on the overall story ‘Noah’ in bible and other factors as camera movement for cinematic. We created a cinematic content that created video clips and played games based on storytelling.

Keywords :

Cinematic Storytelling Game.

SitBuCe: A SMALL DATA-DRIVEN GENERALIZATION STRATEGY FOR TECHNOLOGY MATURITY STATUS MAPPING

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²Department of Information Systems, University of Cape Town, RSA

³United Nations University, Institute for Computing and Society, Macau

Abstract

In line with the current growth of the small data ecosystem documented beautifully by smalldatagroup.com and other sources, this paper proposed a small data approach to Technology Maturity Status Mapping generalization, by creating a situation, out of small data scenarios, to drive the process. The research methodology focused on our earlier work on Technology Maturity Status Mapping as the software in need of use case elicitation. It is in the context of maximizing the contribution that data makes to society that we introduced our Situation-Based, Use Case Elicitation, SitBuCe strategy to create a generalization situation out of peacekeeping and healthcare scenarios as small data instances. The outcome of analyzing the two scenarios was called a situation and used to derive two out of four use cases. The study outcome suggested that SitBuCe validated Technology Maturity Status Mapping as a dynamically updatable resource in project-related decision-making.

Keywords :

Small Data Driven, Maturity Status Mapping, Situation-Based, Use Case Elicitation, ICTD.

Acknowledgment

This work was made possible through the sponsorship received from both the UNU-Institute for Computing and Society, Macau, visited from July-November 2017 and the Zululand University sabbatical leave 2017 grant.

AN EFFICIENT CONVERSION APPROACH OF THE BANGLA INFINITE VERB SENTENCE INTO UNL

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Abstract

This paper presents conversion procedure of Bangla infinite verb sentences to assimilate them into an interlingua representation called Universal Networking Language (UNL). It focuses the analysis of infinite verbs and develops the morphological rules to resolve morphological analysis between the infinite and finite verbs. This paper also develops semantic rules to perform semantic analysis between the words in a sentence for the EnConverter to convert infinite verb sentence into UNL Expression. Finally, we have shown the conversion procedures of a Bangla infinite verb sentence into UNL.

Keywords :

UNL, NLP, Infinite Verb, EnConverter, Universal Words.

The Structural Influences of Suicide-related Keywords Search on Suicide Rate in Korea

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Hyun-Seok Hwang⁴**

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Abstract

This research aimed to investigate the correlation between suicide-related keywords and actual suicide rate of Korean males. To do so, five words related to ‘suicide’ such as society, pain, anger, stress and depression were extracted and it aimed to investigate the relationship based on the difference in duration between the date of search and the actual date of suicide. As a result, the actual rate of suicide of men was found to be significant with time difference of about three months from the time of searching for the words related to suicide.

Keywords :

Suicide, Depression, Gender Paradox.

Acknowledgment

This work was supported by the National Research Foundation of Korea Grant funded by the Korean Government (NRF-2015-S1A3-A2046760).

A NOVEL SIMILARITY MEASURE FOR TRACE CLUSTERING BASED ON NORMALIZED GOOGLE DISTANCE

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² Banking Academy of Vietnam, Hanoi, Vietnam

Abstract

In trace clustering, a problem of process mining, traditional distance measures only focus on the local relationship between trace pairs. In this paper, we propose a new method to measure the global relationship of the traces based on the Normalized Google Distance. Experimental results show that our method not only outperforms alternatives but also helps to speed up the trace clustering.

Keywords :

Process Mining, Process Discovery, Trace Clustering, Normalized Google Distance, Similarity Measure.

Factors Affecting Social-Presence and Self-Presence in Virtual Reality Media

Sang-Min Park, Min-Ji Choe, Jeong-Min Park and Ghee-Young Noh

Department of Interaction Design / School of Media Communication*

Hallym University

South Korea

Abstract

This study aimed to identify the psychological factors that users perceive while watching a virtual reality video for preventing infectious diseases, and to analyze the effect of these factors on presence. The results of the study revealed that arousal was the most important factor in determining the presence in virtual reality videos. In addition, it was confirmed through this study that proximity was a central factor affecting self-presence while tangibility was a decisive factor affecting social-presence.

Keywords :

VR Media, Presence, Arousal, Proximity, Tangibility

Acknowledgment

This work was supported by the National Research Foundation of Korea Grant funded by the Korean Government (NRF-2015-S1A3-A2046760).

Presentation Session 3-1

Advanced Computing, IoT and Smart Cities

Session Chair: Dr. Shashidhar Ram Joshi

1. Smart Indoor Farming using Intel Edison and Amazon Web Services- Internet of Things
 - Pavan Kumar Konda, Hamid Shahnasser
2. Redundant Association-Rule Mining Reduction for Rosewood Crime Arrest Planning
 - Wararat Songpan, Ngamnij Arch-in, Rit Loaphanom
3. An IoT Smart Home Design with Security Consideration
 - Dongmin Lee and Seunghyun Oh
4. An Effective Depth Map Navigation for Mobile Robot in Indoor Environments
 - Dang Khanh Hoa, Than Duc Viet, Vu Minh Hoang, Vu Song Tung, Nguyen Tien Dzung
5. Design of a Cost-Effective Soil Monitoring System to Support Agricultural Activities for Smallholder
 - Tien Cao-Hoang, Trong Tinh Pham Van, Can Nguyen Duy
6. A Blockchain-based ID/IP Mapping and User-friendly Fog Computing for Hyper-connected IoT Architecture
 - Moon Yong Jung, Won-Suk Kim , Sang-Hwa Chung, Ju Wook Jang

Smart Indoor Farming using Intel Edison and Amazon Web Services- Internet of Things

Pavan Kumar Konda, Hamid Shahnasser

School of Engineering
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San Francisco
USA

Abstract

Indoor Farming is a booming Industry. It requires precise measurements and handling techniques for optimal food production. Plant growth largely depends on essential elements like moisture, light, temperature, and humidity of the soil. Each plant has unique requirements for its growth. Therefore, they are to be monitored and controlled. This paper discusses a system that monitors these elements using sensors connected to Intel Edison and uploads data to Amazon Web Services cloud. It displays them on a dashboard and controls the actuators by comparing real time values to threshold values set by the user from a web application.

Keywords :

Smart Indoor Farming, Intel Edison, Amazon Web Services.

REDUNDANT ASSOCIATION-RULE MINING REDUCTION FOR ROSEWOOD CRIME ARREST PLANNING

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Abstract

Nowadays most applications for planning have applied the association rule-mining algorithm. However, the disadvantage of this algorithm encountered the redundant patterns of the rules. For the implementation of the fundamental association rule-mining algorithm (Apriori and FP-Growth), it was found the problem that there were redundant rules which did not exactly serve the user's requirement for the real planning. The operating process was evaluated in terms of the support, the confidence, and the lift. Thus, this study proposed the redundant association-rule mining reduction so that the user could apply it for planning more efficiently and instantly. Additionally, this algorithm has been applied to the real case study of the rosewood crime arrest planning, which was the wood with the legal restriction. The results of the study revealed that it could practically reduce the redundant rules and outputs of the rule patterns as the user's requirement by 75%. The accuracy and precision of the outputs were increasingly higher by 95% as compared to the fundamental algorithm which output the redundant association rules to the user for planning.

Keywords :

Association Rule-Mining, Redundant Rule Mining, Crime Arrest Planning.

Acknowledgment

This study was financially supported by the young researcher development project of Faculty of Science and Khon Kaen University. Moreover, the study was permitted to use the rosewood crime data. The research project on the redundant association-rule mining reduction for rosewood crime arrest analysis and planning was also proposed to Pol. Col. Boonchai Ruechaisa, Deputy Commander of Police Forensic Science Center 4, Royal Thai Police Khon Kaen, Thailand.

An IoT Smart Home Design with Security Consideration

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Abstract

This paper is a study on Arduino based IoT smart home sensor network construction. IoT is composed of sensor devices with network functions, which generally use Wi-Fi, but Bluetooth and ZigBee are also widely used. In this study, various sensors are applied to the home network using Arduino, especially, IoT smart home network is composed and implemented with security consideration. Through research, we have deployed a variety of sensor devices that can be used in a typical home environment. Gas leaks detection, intrusion detection and lighting control, while designing smart phone application program for easy management of external users. Through these experiments, we have obtained the data to design a gateway supporting heterogeneous network connection and established the foundation for smart home IoT management research in the future.

Keywords :

IoT, Smart Home Networks, Sensor Networks, Arduino.

AN EFFECTIVE DEPTH MAP NAVIGATION FOR MOBILE ROBOT IN INDOOR ENVIRONMENTS

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Hanoi University of Science and Technology (HUST)
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Abstract

This article presents a solution of navigation in an indoor environment for a mobile robot that only use a depth stream. In this work, a real-time navigation method is integrated in the self-built robotic system fitted with a Kinect sensor. First, the method applies a viable mobility principle that is a road vehicle only be able to travel on the ground. So, this method starts with finding the ground from the depth video which is provided steady by Kinect. Based on shapes of this reliable ground plane, a robust moving direction selection algorithm is proposed. In the meantime, the robot system always follows the minimum path distance strategy to the given target. At the same time, with a predetermined map of operating environment, robot navigation problem was resolved with the same successful rate of recent methods such as Fast Sampling Plane Filtering (FSPF) method. The robotic system is navigated more robust and refined than the neural network method with a 10-step adjustable angle. Experiments have shown that the stability and accuracy of the proposed navigation algorithm is up to 98%. The processing time of the navigation proposed method is minimized to meet the robot's real-time applications.

Keywords :

Depth map, Ground plane, Path direction, Navigation.

DESIGN OF A COST-EFFECTIVE SOIL MONITORING SYSTEM TO SUPPORT AGRICULTURAL ACTIVITIES FOR SMALLHOLDER

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Abstract

The moisture, temperature and electrical conductivity of soil are the important properties for agriculture. It is necessary to monitor such data in order to support the agricultural activities, especially improve the yield and reduce the irrigation water. However, the currently commercialized monitoring systems are too expensive for the smallholder who has only under two hectares of farmland. The objective of this study is to develop a cost-effective system for monitoring the soil data, which consists of a monitoring device and a web-based application. The monitoring device measures the soil information every one hour and then transmits such data to the cloud for storing and visualizing. The system has been testing in the experiment field to evaluate the system's stability.

Keywords :

Soil Monitoring System, Internet of Thing.

A Blockchain-based ID/IP Mapping and User-friendly Fog Computing for Hyper-connected IoT Architecture

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Ju Wook Jang¹⁾**

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Abstract

We address two impending issues related to hyper-connected IoT architecture: 1) how to securely map the ID(Identification) of a device to the IP address to which it is connected 2) how to handle data explosion and emerging latency-sensitive applications for cloud computing in the IoT architecture. The recent increase in reported incidents of surveillance and security breaches compromising privacy call into question the current server-based model of IoT Device/Resource Retrieval Framework, in which trusted third parties collect and control massive amounts of data. For example, NRS(Naming Resolution Service) provides mapping IDs of numerous IoT devices to corresponding IP addresses. These server-based approaches are prone to Single point of failure, Sybil attack, or IP Spoofing. When a centralized global NRS server is attacked, the user retrieves the location through the ID of the IoT device, but the attacked Global NRS server intentionally notifies the incorrect IP address to the user (163.219.10.3 -> 111.111.111.111). When a user accesses through the address 111.111.111.111, user cannot control the desired IoT device. Also, there is a risk that if a single node masquerades as an NRS servers in the network through Sybil attack, the system-wide data may change according to the attacker's intention.

To combat these attacks we need a new mechanism in which each node authenticates itself to the whole network. All these possible hazards can be removed in a new framework by replacing the centralized servers by block chain which have recently appeared in the form of cryptocurrencies such as Bitcoin and Ethereum. By design, blockchains are inherently resistant to modification of the data. In addition, by storing data across its network, a blockchain eliminates the risks that come with data being held centrally. Our work in progress study how block chain can be used to provide Authentication, Non-repudiation and Data Integrity to IoT Device/Resource Retrieval Framework. By recording the mappings between IDs and their current IP addresses on blockchain, this framework can manage the various IoT devices and resources. Recently, we propose this as a study item to ITU SG17.

Keywords :

Blockchain, Hyper-Connected IoT Architecture.

Acknowledgement:

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Presentation Session 3-2

ICT and Advanced Computing

Session Chair: Dr. Woong Cho

1. Web Cache Optimization with Bayesian and Maximum Likelihood Estimation
 - Prapai Sridama
2. Development of Simulator for Smart Grid System
 - Hanho Kim, Haesung Tak, Hwan-gue Cho, Heeje Kim
3. Development of PnP Vehicle: Basic Concept and Its Applications
 - Woong Cho, Jeaho Hwang
4. A Supervisory Controlled System for the Alcohol-Free Beer Production Process
 - Dinh Van Thanh, Dinh Thi Lan Anh , Nguyen Tuan Anh,Dang Xuan Hieu, Bui Quang Minh, and Nguyen Tuan Anh
5. Wrist Pulse Measurement for Pulse Diagnosis in Traditional Chinese Medicine
 - Viet Dung Nguyen, Le Thu Thao Dao, Anh Vu Tran, Thai Ha Nguyen
6. Fuzzy Multilayer Perceptron with Cuckoo Search.
 - Suwannee Phitakwinai, Sansanee Auephanwiriyakul, Nipon Theera-Umpon

WEB CACHE OPTIMIZATION WITH BAYESIAN AND MAXIMUM LIKELIHOOD ESTIMATION

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Abstract

The objective of this research increases efficiency of web cache memory. The Web Cache Optimization with Bayesian and Maximum Likelihood Estimation (WCO-BMLE) simulation is investigated for decision making about web objects replacement based on web usage and dynamic decision. WCO-BMLE model used web objects data more than 30 weeks for prediction of web usage probability. In addition, many Statistics Mathematics theories are used within WCO-BMLE model as follows: Interpolation with Cubic Spline for curve fitting lines, an agent finding of each web usage objects with Expected Value algorithm, First Order Condition (FOC) using for trend study of web usage in the past. However, FOC is a technique to decide the replacement. WCO-BMLE model is a replacement technique that solves replacement problem better the Least Recently Used (LRU) technique. Though, Dynamic Programming with Bellman equation is last technique when others technique cannot solve replacement problems. In addition, Bayesian algorithm and Maximum Likelihood Estimation is raised when web usage from clients are different from in the past.

Keywords :

Computing, Cubic spline, Bellman equation, Bayesian.

Development of Simulator for Smart Grid System

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Abstract

In this paper proposes and implements a simulator for the prediction and control system experiments of smart grid system. The Smart Grid is a next-generation intelligent power grid that combines information technology and needs a control system to distribute power to producers and consumers. Traditional simulators are inconvenient to use if they do not know their electrical knowledge. In this paper, we propose a simulator for power prediction and control experiment of smart grid. The proposed system is simulated using past data and simulation results are explained through monitoring examples.

Keywords :

Smart Grid, Simulator, Visualization.

Acknowledgment

This research was supported by Basic Research Laboratory through the National Research Foundations of Korea funded by the Ministry of Science, ICT and Future Planning (NRF-2015R1A4A1041584).

Development of PnP Vehicle: Basic Concept and Its Applications

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Abstract

Autonomous vehicles have been widely considered as next generation vehicle for their benefits in economy, environments, and convenience. These vehicles equip various sensors or communication devices for providing autonomous driving, safety information, and multimedia services. In this paper, we introduce the PnP (Plug-and-Play) vehicle which can be applied electric and autonomous vehicles with some suggested applications. Then, we discuss implementation issues of PnP vehicle.

Keywords :

Autonomous Vehicle, PnP Vehicle, V2X.

Acknowledgment

This work was supported by Institute for Information & communications Technology Promotion (IITP) grant funded by the Korea government (MSIT) (No.R0190-15-2071, Open PNP platform for diversity of autonomous vehicle based on cloud map).

A SUPERVISORY CONTROLLED SYSTEM FOR THE ALCOHOL-FREE BEER PRODUCTION PROCESS

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and Nguyen Quang Tien²

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Abstract

Alcohol free beer is of government interest for its social benefit of reducing alcohol-related risks and it is new product line in Vietnam. Of technical challenge in such production is the process of alcohol separation. Particularly, alcohol composition in beer is reduced to smaller or equal to 0.5% abv using a vacuum distillation column. The main product of the process is non-alcoholic beer and the secondary product is sellable alcohol with the composition up to 75% abv [3]. The objectives of our work are to improve the system performance [5] and propose the supervisory and control system for dealcoholization plant that can implement in many breweries in Vietnam.

Keywords :

Industrial Process Control, Modeling of Dynamic Systems, MPC

WRIST PULSE MEASUREMENT FOR PULSE DIAGNOSIS IN TRADITIONAL CHINESE MEDICINE

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Abstract

Among four diagnostic methods in Traditional Chinese Medicine, pulse diagnosis is a convenient method for diagnosing various diseases. It is based on blood pressure pulse patterns felt by doctor's three fingers. However, pulse diagnosis is subjective which affects the reliability and repeatability of the diagnosis. Different pulse measurements have been proposed. In this paper, we demonstrate a method to measure wrist pulse using piezoresistive pressure sensor. Experiment results show potential usefulness of the proposed method.

Keywords :

Traditional Chinese medicine, Pulse measurement, Pressure sensor.

FUZZY MULTILAYER PERCEPTRON WITH CUCKOO SEARCH

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Abstract

In this paper, we propose a fuzzy multilayer perceptron with cuckoo search for fuzzy vectors. We implement this algorithm on two real-world data sets, i.e., Knowledge-Based Evaluator data set and Postoperative patient data set. We also compare the result from the fuzzy multilayer perceptron with cuckoo search with that from the regular multilayer perceptron with cuckoo search of centroid of each fuzzy attribute and numeric value mapped from each fuzzy attribute. The fuzzy multilayer perceptron with cuckoo search provides a comparable result with those on the regular multilayer perceptron with cuckoo search on real number without any defuzzification.

Keywords :

Fuzzy Vector, Multilayer Perceptron, Cuckoo Search Algorithm.

Acknowledgment

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Presentation Session 3-3

Digital Convergence Business

Session Chair: Dr. Chang Su Kim

1. Performance Analysis and Comparison for Linked Data Index Structure
 - Sun Yu Xiang, Yongju Lee
2. Insight the Financial Risk Measurement to Support the Effective Communication between Regulators, Advisors, and Investors
 - Patsiree Worawachtanakul, Tanakorn Likitapiwat, Chaipat Lawsirirat
3. Word Cloud of Online Hotel Reviews in Thailand for Customer Satisfaction Analysis
 - Vimolboon Cherapanukorn, Phasit Charoenkwan
4. A Study on Business Ecosystem of 3D Printing Contents Distribution Platform: Using Service Value Network Analysis
 - Hyeog In Kwon, Seol Hee Kim
5. An Augmented Reality Based Approach for Worker Support System on Recycling of End of Life Products
 - Philjun Moon, Young-Woo Kim, Jinwoo Park

Performance Analysis and Comparison for Linked Data Index Structure

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Abstract

With the development of semantic Web and the rapid growth of data volume of RDF, the storage and retrieval of the large-scale RDF data have become a research hotspot. Therefore, it is an important issue how to store and query the large-scale RDF data by k-d tree and R*-tree, and analysis the strength and weakness of both techniques. We also propose an optimized scheme focus on the join query for adapting R*-tree.

Keywords :

K-D Tree, R*-Tree, Linked Data, RDF, SPARQL, Semantic Web, Dbpedia.

Acknowledgment

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INSIGHT THE FINANCIAL RISK MEASUREMENT TO SUPPORT THE EFFECTIVE COMMUNICATION BETWEEN REGULATORS, ADVISORS, AND INVESTORS

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Abstract

Understanding of the risk characteristic on financial product is a crucial point for investment decision. Basically, the risk measurement currently used is “standard deviations” as the risk category in Key Investor Information Documents, the document which is provided critical information to retail investors. Although, standard deviation is utilized as a risk measurement tool in traditional finance, but some arguments stated the validation of this measurement such as the multidimensionality of risk and the accuracy of subjective measurement. Consequently, the purpose of this research aims to investigate the insight of investors’ risk perception and measurement under financial scenario experiment. The experimental design was setting data from expected return and possibility to gain and loss collaborated with mathematical computing for generating the characteristic of measurements. The results are particularly useful in financial investment context and also support the effective communication between financial regulators, advisors, and investors.

Keywords :

Financial Risk Management, Effective Communication.

Word Cloud of Online Hotel Reviews in Thailand for Customer Satisfaction Analysis

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Abstract

This study intentions to examine the satisfied and unsatisfied of hotel customers by using a word cloud approach to evaluate online reviews. An online commands of 9,709 hotel guests were collected from TripAdvisor.com for 30 hotels in three cities of Thailand. The results revealed some common features that are identified in both satisfied and dissatisfied of customer reviews. Therefore, this article suggests a clearer managerial implications pertaining to understanding of hotel guest satisfaction level via the utilization of world cloud technique through online platforms.

Keywords :

Word Cloud, Online Command, Customer Satisfaction.

A Study on Business Ecosystem of 3D Printing Contents Distribution Platform: Using Service Value Network Analysis

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2 Department of Arts and Cultural Management, Chung-Ang University, Seoul, South Korea

Abstract

This study is a research on ecosystems focused on activating the domestic 3D printing contents distribution platform and aims to promote the industry by suggesting service strategies and an ideal ecosystem model. 3D printing contents distribution platform creates the higher value in the service market by distributing its services while increasing consumer accessibility, a crucial factor in market expansion. In order to this aim, state of the 3D printing contents distribution platform ecosystem and its issues and problems are analyzed, then, Delphi survey and AHP were used to deduct service strategies. Service strategies were implemented to deduct and map a future virtuous cycle of ecosystem using service value network model.

Keywords :

3D Printing, 3D Printing Contents Distribution Platform, Business Ecosystem, Service Value Network, Delphi Survey, AHP

Acknowledgement

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AN AUGMENTED REALITY BASED APPROACH FOR WORKER SUPPORT SYSTEM ON RECYCLING OF END OF LIFE PRODUCTS

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Abstract

Product recycling, which aims to maximize lifecycle value creation and to conserve environment, becomes important. However, much of product recycling has been done by third party remanufacturers, which is complicated by the need to deal with the various models manufactured by various manufacturers. Furthermore, the working method can be varied depending on the recycling option that comes from lifecycle history, even in the same model. This characteristics impose a heavy burden on the worker, which results in problems of inefficiency caused by human errors. To deal with this problem, an augmented reality based approach for worker support on the complex remanufacturing shop floor, which considers efficiency of information delivery, is proposed in order to minimize human errors.

Keywords :

Remanufacturing, Worker Support, Augmented Reality