

CONFERENCE PROGRAM

June 15-17, 2019 | Hong Kong

**2019 The 9th International Workshop on Computer Science
and Engineering
(WCSE 2019)**

**With the workshop of
2019 The 7th International Conference on Information
Technology and Science
(ICITS 2019)**

**2019 The 4th International Conference on Electronics
Engineering and Informatics
(ICEEI 2019)**

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Welcome Address

We are pleased to welcome you to 2019 the 9th International Workshop on Computer Science and Engineering (WCSE 2019) With the workshop of 2019 The 7th International Conference on Information Technology and Science (ICITS 2019) 2019 The 4th International Conference on Electronics Engineering and Informatics (ICEEI 2019), which will take place in Hong Kong during June 15-17, 2019.

After several rounds of review procedure, the program committee accepted those papers to be published in conference proceedings. We wish to express our sincere appreciation to all the individuals who have contributed to WCSE 2019, ICITS 2019 and ICEEI 2019 conferences in various ways. Special thanks are extended to our colleagues in the program committee for their thorough review of all the submissions, which is vital to the success of the conference, and also to the members in the organizing committee and the volunteers who had dedicated their time and efforts in planning, promoting, organizing and helping the conference.

Three speakers: Prof. Hong Lin, University of Houston-Downtown, USA; Prof. Yonglei Tao, Grand Valley State University, Allendale, USA and Prof. Heng Chen, Shanghai Information Center for Life Sciences/ Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, Shanghai, China will give them excellent speeches in the conferences

Conferences will be composed of 7 oral sessions 1 poster session and 1 track. One best presentation will be selected from each session, evaluated from: originality; applicability; technical Merit; qualities of PPT; English. The best one will be announced at the end of each Session, and awarded the certificate over the dinner banquet.

Let me, on behalf of the conference committee; cordially invite you to this outstanding conference. We look forward to receiving your paper in either research or development of acquired knowledge in order to disseminate to the wider audience. Join us at this event to see other excellent researchers share their work.

We wish you a successful conference and enjoyable visit in Hong Kong!

WCSE 2019
Conference Organizing Committee
Hong Kong

Organizing Committee

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Xiangxian Chen, Zhejiang University, China

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Hong Lin, University of Houston-Downtown, USA

Hayato Ohwada, Tokyo University of Science, Japan

Program Chairs

Yonglei Tao, Grand Valley State University, USA

Heng Chen, Chinese Academy of Sciences-Shanghai, China

Xiuzhong Xu, Shanghai Maritime University, China

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Nurbek Saparkhojayev, Satbayev University, Kazakhstan

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Zenghui Wang, University of South Africa, South Africa

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Muruga Boopathi, Engineering College, India

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Suchada Ratanakongnate, King Mongkut's University of Technology North Bangkok, Thailand
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Chao-Tung Yang, Tunghai University, Taiwan
Ruey-Shun Chen, China University of Technology, Taiwan
Sudheer Reddy K, Acharya Nagarjuna University, India
Ruksar Fatima, KBN College of Engineering Gulbarga, India
Hepu Deng, RMIT University, Australia
Joe Marie D. Dormido, Carlos Hilado Memorial State College, Philippines
Yuh-Jen Chen, First University of Science and Technology, Taiwan
Motofumi T. Suzuki, The Open University of Japan, Japan
Cecilia E. Nugraheni, Parahyangan Catholic University, Indonesia
Juntao Fei, College of IoT Engineering, Hohai University, China
Peng Lu, Northeast Electric Power University, China
Wenyuan Li, Southeast University, China
Li Cheng, Fujian Agriculture and Forestry University, China
Zeplin Jiwa Husada Tarigan, Petra Christian University, Indonesia
Jingyu Zhang, Tianjin University of Technology and Education, China
Bobby D. Gerardo, West Visayas State University, Philippines
Khine Moe New, University of Computer Studies, Myanmar
Chunfeng Wang, China Academy of Space Technology, China
Qin Zhen, University of Electronic Science and Technology of China, China
Bi He, Shandong jiaotong university, China
Worarat Sangmanee, King Mongkut's Institute of Technology Ladkrabang, Thailand
Michael Pacis, Mapua University, Philippines
Inthraporn Aranyanak, King Mongkut's Institute of Technology Ladkrabang Bangkok, Thailand
Hsin-I Huang, National Taichung University of Science and Technology, Taiwan
Jae-ho Choi, Chonbuk National University, Rep. of Korea
Mustapha Belaisaoui, Hassan I University, Morocco
Edgar Bryan Nicart, Camarines Norte State College, Philippines
Jocelyn Torio, Camarines Norte State College, Philippines
Aniruddha Satoskar, Cirrus Logic in Austin, USA
Bo-Lian Chen, Palo Alto, USA

Local Information



Conference Venue



HARBOUR PLAZA
8 DEGREES

KOWLOON • HONG KONG

Harbour Plaza 8 Degrees

Add: 199 Kowloon City Road, Tokwawan, Kowloon, Hong Kong

Contact: Iva Lo | Mail: ival@hp8dcatering.com | Tel: +852 2126 1976



Transportation Around

By Taxi

- MTR Hunghom Station- 8 mins
- Mongkok (Shopping Area)-10 mins
- MTR Tsimshatsui Station-12 mins
- Airport Express Kowloon Station-15 mins
- Kowloon Bay (1 Kowloon)-10 mins
- China Ferry Terminal, China Hong Kong City, Tsimshatsui (Ferries to Macau / China)-15 mins
- Central-30 mins
- Hong Kong Disneyland-40 mins
- Hong Kong International Airport-45 mins
- AsiaWorld-Expo-52 mins

By Short Walk

- Pak Tai Street (Local Shopping and Food Alley with Global Selection)-1 min
- First Ferry Kowloon City Pier (Ferries to North Point)-8 mins



Time

UTC/GMT+8



Weather

The Weather Situation of Hong Kong in June

Average daily minimum temperature

26°C

Average daily highest temperature

30°C



Emergency

Emergency Call: 999

Instructions for Oral & Poster Presentations

Oral Presentations

- **Timing:** a maximum of 15 minutes total, including speaking time and discussion. Please make sure your presentation is well timed. Please keep in mind that the program is full and that the speaker after you would like their allocated time available to them.
- You can use CD or USB flash drive (memory stick), make sure you scanned viruses in your own computer. Each speaker is required to meet her / his session chair in the corresponding session rooms 10 minutes before the session starts and copy the slide file (PPT or PDF) to the computer.
- It is suggested that you email a copy of your presentation to your personal in box as a backup. If for some reason the files can't be accessed from your flash drive, you will be able to download them to the computer from your email.
- Please note that each session room will be equipped with a LCD projector, screen, point device, microphone, and a laptop with general presentation software such as Microsoft Power Point and Adobe Reader. Please make sure that your files are compatible and readable with our operation system by using commonly used fronts and symbols. If you plan to use your own computer, please try the connection and make sure it works before your presentation.
- **Movies:** If your Power Point files contain movies please make sure that they are well formatted and connected to the main files.

Poster Presentations

- Maximum poster size is 36 inches wide by 48 inches high (3ft.x4ft.)
- Posters are required to be condensed and attractive. The characters should be large enough so that they are visible from 1 meter apart.
- Please note that during your poster session, the author should stay by your poster paper to explain and discuss your paper with visiting delegates.

Dress code

- Please wearing formal clothes or national characteristics of clothing

Speakers in WCSE 2019



Prof. Hong Lin

University of Houston-Downtown, USA

Title: Opportunities and Challenges in Personal Healthcare Systems

Abstract: The well-being of a person consists of 2 aspects: the physical body well-being and the mind well-being. With the advances in data analytics and sensing technologies, physiological data can be collected and analysed to provide objective comprehensive personal health information. The information helps us understand the well-being of the person and then further offers the opportunity to develop personal healthcare system for the well being of the person. We report our preliminary findings in applying various modern information technologies to personal healthcare systems. We review a brain activity level model by using EEG signals to objectively measure the effectiveness of meditation, detect mental fatigue and boredom, and comprehend human emotions. We examine the use of accelerometer and GPS data to assess sports performance and training enhancement, leg muscle injury prevention and recovery monitoring, and fall prevention for aged people. In addition, the ubiquitous nature of accelerometer and GPS technology make it possible to deliver personal healthcare services for people in physical exercise. Then, we exploit the potential of Kinect device in monitoring the movements of aged persons in their houses to prevent falls. We discuss the evolution from brain-to-computer (B2C) interaction to brain-to-brain (B2B) interaction, and an application of the B2B interaction in personal training program. Finally, we point out some remaining challenges and possible opportunities in using sensing technologies and data mining to deliver personal healthcare.

Biography: Prof. Hong Lin received his PhD in Computer Science in 1997 at the University of Science and Technology of China. Hong Lin was a postdoctoral research associate at Purdue University; an assistant research officer at the National Research Council, Canada, and a software engineer at Nokia, Inc. Dr. Lin is currently a professor in computer science and an assistant chair at the Department of Computer Science and Engineering Technology. His research interests include human-centered computing, cognitive intelligence, data analytics, and parallel/distributed computing. He is the supervisor of the Grid Computing Lab at UHD. He is also a senior member of the Association for Computing Machinery (ACM).



Prof. Hayato Ohwada

Tokyo University of Science, Japan

Title:

Biography: Prof. Hong Lin received his PhD in Computer Science in 1997 at the University of Science and Technology of China. Hong Lin was a postdoctoral research associate at Purdue University; an assistant research officer at the National Research Council, Canada, and a software engineer at Nokia, Inc. Dr. Lin is currently a professor in computer science and an assistant chair at the Department of Computer Science and Engineering Technology. His research interests include human-centered computing, cognitive intelligence, data analytics, and parallel/distributed computing. He is the supervisor of the Grid Computing Lab at UHD. He is also a senior member of the Association for Computing Machinery (ACM).



Prof. Yonglei Tao

Grand Valley State University, USA

Title: Reusable Software Support for Adaptive User Interfaces

Abstract: Adaptive user interfaces are an alternative to the traditional one-size-fits-all user interfaces. They have the ability to adapt their structures, appearances, and behavior to a variety of objectives, aiming to provide highly usable applications for people with different needs and in different contexts of use. Successful design and development of adaptive user interfaces are one of the major research directions in the areas of human computer interaction and software engineering.

Navigation defines possible paths that users can take through an application to access certain information or functionality. Its efficiency has a great impact on user experience. Adaptive navigation guides users to their specific objectives by altering the normal way an application allows to navigate and therefore provides better user experience.

Users make a sequence of decisions when they navigate a user interface. Such decisions are interdependent - later decisions are affected by earlier decisions. It is essential to have the capability to track user activities, identify user intent, and choose an adaptation strategy. However, implementation of this capability often relies on intimate knowledge of the target application, which makes its development and maintenance rather difficult especially when the user interface and its adaptation logic evolve.

We propose a two-step approach to achieving reusability of software support. Briefly, we use aspect-oriented instrumentation to capture user interface events and then conduct model-based analysis on event traces to identify user tasks. As our experiment shows, this approach provides reusable support for adaptive navigation at the task level.

Biography: Prof. Yonglei Tao is a professor in the School of Computing and Information Systems at Grand Valley State University, Michigan, USA. He received his Ph.D. in Computer Science from the University of Iowa. His research interests includes tool support for usability evaluation, software design methods, and computer science education.



Prof. Heng Chen

Shanghai Information Center for Life Sciences/ Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, Shanghai, China

Title: Application of Linked Data in HBV Literature Database, HBV Protein Ontology and Knowledge Navigation

Abstract: With fast development of the researches on hepatitis B virus (HBV), a large number of the research achievements have been generated and scattered in various literatures. Information service providers are meeting the challenge of satisfying readers' needs for more efficient and intelligent retrieval. Data mining and information integration are basically the promising and effective ways which become more and more important. Based on previous research and planning, our study systematically sorted out and classified knowledge related to the viral protein of HBV and the HBV life history on the basis of collecting HBV- and HBV-related protein information of book, literature and virology dictionary. The HBV specific literature knowledge database and the HBV-related protein ontology were successfully constructed. In this study, the linked data technology was introduced for information integration and navigation. As you see, linked data is a structured data which is interlinked with other data so that become more useful through semantic queries. It builds upon standard Web technologies such as Http, RDF and URIs, but rather than using them to serve web pages only for human readers, it extends them to share information in a way that can be read automatically by computers. Part of the vision of linked data is for the internet to become a global database. With the support of computer programming and linked data, the design and application of the navigation system of hepatitis B virus (HBV) knowledge based on the HBV protein ontology was successfully finished.

Biography: Professor Heng Chen, ever earned his PH.D in Shanghai Jiaotong University, China in Nov.2004, and pursued his postdoctoral study in University of Alberta, Canada from 2005 to 2007. He has been working in Shanghai Institutes for Biological Sciences as a director of database department, who is mainly responsible for the innovative research and development work such as construction of life science information and intelligence database, knowledge mining and extracting, knowledge organization and resource management and other aspects since July 2008. He was ever selected in the outstanding talent introduced plan in the Chinese Academy of Sciences literature and journal publishing field (subject field 100 program) in 2010, and was selected in Shanghai Pujiang talent program in 2009. Dr. Heng Chen is currently a member of the advisory Committee of the magazine Hepatitis Monthly (SCIE) and members of editor board of the International Journal of Biochemistry Research & Review, Journal of Biochemistry International, Current Research Journal of Biological Sciences and International Journal of Biochemistry and Molecular Biology. Hitherto, Dr. Heng Chen has published more than 40 scientific research papers in the capacity of the first author or the corresponding author. He has presided over 7 projects at the national, district and local level as project leaders since 2008. So

far, he has applied for 4 invention patents, of which 1 has been authorized, and applied for 3 items of software copyright registration.

Conference Schedule

Day 1, Saturday, June 15, 2019	
10:00-16:00	Arrival Registration at the hotel lobby Venue: 199 Kowloon City Road, Tokwawan, Kowloon, Hong Kong
Day 2, Sunday, June 16, 2019	
Keynote Speeches	
Room: Salon V-VII	
09:00-09:05	Opening Remarks Prof. Hong Lin, University of Houston-Downtown, USA
09:05-09:45	Speech 1 <i>Speech Title:</i> Prof. Hayato Ohwada, Tokyo University of Science, Japan
09:45-10:25	Speech 2 <i>Speech Title: Opportunities and Challenges in Personal Healthcare Systems</i> Prof. Hong Lin, University of Houston-Downtown, USA
10:25-10:50	Group Photo and Coffee Break
10:50-11:20	Speech 3 <i>Speech Title: Reusable Software Support for Adaptive User Interfaces</i> Prof. Yonglei Tao, Grand Valley State University, USA
11:20-11:40	Speech 4 <i>Speech Title: Application of Linked Data in HBV Literature Database, HBV Protein Ontology and Knowledge Navigation</i> Prof. Heng Chen, Shanghai Information Center for Life Sciences/ Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, Shanghai, China

11:40-12:45	Lunch Venue: Conference Room
Afternoon Parallel Sessions	
12:45-14:45	< Salon V > Parallel Session 1 [Topic: Data Analysis] Presentation Papers: W2012, W2025, W2028, W2069, W3019, W1021, W1075, W1115
12:45-14:45	< Salon VI > Parallel Session 2 [Topic: Control System] Presentation Papers: W2013, W2020, W11001, W2021, W11002, W1019, W1076, W1079
12:45-14:45	< Salon VII > Parallel Session 3 [Topic: Software Engineering] Presentation Papers: W2040, W2066, W2070, W1042, W1055, W1081, W2031, W2032
12:45-14:45	< Salon VIII > Parallel Session 4 [Topic: Computer applications] Presentation Papers: W2011-A, W2027, W2051, W3005, W1085, W1080, W11006, W1044
12:45-13:45	< Salon IX > Track 1 [Topic: Human-Centered Computing] Presentation Papers: W1074-A, W1309-A, W1133, W1136
13:45-14:45	< Salon IX > Poster Session 1
14:45-15:00	Coffee Break
15:00-17:00	< Salon V > Parallel Session 5 [Topic: Computer Technologies] Presentation Papers: W1057, W2073, W1087, W11007, W1093, W1086, W11001, W2067
15:00-17:00	< Salon VI > Parallel Session 6 [Topic: Communication system] Presentation Papers: W2022, W3016, W1008, W1048, W1302, W2053, W3002-A

15:00-17:00	<p style="text-align: right;">< Salon VII ></p> <p>Parallel Session 7 [Topic: Information Technology] Presentation Papers: W1303, W1078, W2018, W2029, W2071, W1064, W2065</p>
15:00-17:00	<p style="text-align: right;">< Salon VIII ></p> <p>Parallel Session 8 [Topic: Pattern recognition and classification] Presentation Papers: W2014, W2059, W1058, W1059, W1060, W1121, W1014</p>
18:00-19:30	<p style="text-align: center;">Dinner Banquet Venue: Garden Room</p>
Day 3, Monday, June 17, 2019	
10:00-20:00	Optional City Tour

Posters at a glance

Poster Session Venue: Salon IX Time: 13:45-14:45		
1	W1004-A	HSPXY: A Hybrid-Correlation and Diversity-Distances Based Data Partition Method
2	W1005	Fault diagnosis of rolling bearings under variable load conditions based on multi-domain features and random forests
3	W1006	Numerical simulation of influence of boundary slip on lubrication performances considering cavitation of textured surface
4	W1018	Research on Plant Growth Environment Control System Based on BP Neural Network
5	W1022	Convolutional and Long Short-term Memory Neural Network for Earthquake Detection
6	W1026	Particle Velocity Measurement of Pulverized Coal flow on a Power Plant Using Electrostatic Sensor Array
7	W1029	Design of Vineyard Ecological Environment Monitoring System Based on Wireless Sensor Network
8	W1034	Analysis and Calculation for Sound Transmission Loss of Aircraft Fuselage Interior Panel
9	W1035-A	The Comparison of Brain Functional MR Images for Aphasia with Picture- and Video-Based Treatment
10	W1036-A	Mammography Feature Characterization Using Empirical Mode Decomposition
11	W1037-A	Weaning Time Prediction Using Respiratory Rate Variabilitybased Machine Learning
12	W1039	Structural Frequency Response Function Prediction and Experimental Validation between Aircraft Mount and Pylon
13	W1041	The Effects on Acoustic Characteristics of Aircraft with Constrained Layer Damping
14	W1043	Estimation of Aircraft Engine Mount Dynamic Forces based on Least-Squares Scheme
15	W1072	Fully Convolutional Network with Intermediate Reservation for Insulator Segmentation
16	W1073	An improved frequent pattern mining Algorithm based on TB-tree and tissue-like P system
17	W1091	Design of Robot Based on Internet of Things
18	W1061	Cooperative Caching Technique for Multimedia Streaming Service in Mobile Ad-hoc Networks
19	W1128	A control strategy algorithm for finite alternating transition systems
20	W1125	Design of a First-order Annular Inverted Pendulum System
21	W1116	Research on TSP Application Based on Improved Ant Colony Algorithm
22	W1009	Research on Image Feature Recognition Based on Convolution-Long Short Term Memory Network
23	W1024	A distributed fuzzy support vector machines model for real network traffic
24	W1031	A research on overseas investment decision of power grid project based on value orientation and risk prevention
25	W1040	Research on Crime Prediction Model Based on Random Forest
26	W1054	Research of Ship Autopilot Rudder Based on Deep Belief Network
27	W1201	The Design of Two-Wheeled Robotic Self-Balancing Walking Control System
28	W1117	Simulation Study on Modeling and Operation Characteristics of Lubricating System of Marine Power Plant
29	W1017	How to Obtain the Missing Terms of Reduced-Round DES
30	W3008	An Equivalent Range Model Based on Time Resampling for High-Speed Maneuvering Platform SAR

31	W3009	Design and Implementation of Real-time Video Processing and Transferring System Based on TMS320C6678
32	W3020	Small Intelligent Home System With Speech Recognition Based On ARM Processor
33	W1010	Effects on the Successful Use of Mobile Phone Application for Healthcare
34	W2015	Research on Discovery and Classification Technology of Electric Power Marketing Field Terminals
35	W2016	Analysis of Illegal Terminal Bypass Blocking in Power Industry Marketing Scene Based on Network Topology and Result Estimation
36	W2017	A Method of Fingerprint Legitimacy Discrimination Based on Fuzzy Matching Algorithms for Terminal Equipment
37	W2023	A Time-aware Multi-task Learning Model for Customer Value Prediction in Civil Aviation
38	W2052	Latent Factor-based Rating Feedback Learning for Restaurants Recommendation
39	W2055	Network Design for Express Package Delivery Service of Electric Vehicles
40	W2063	Research on the Privacy Security Puzzle Scheme of Blockchain
41	W2068	Research on Real-time Behavior Recognition Method Based on Deep Learning
42	W2078	Solving the Problems for Optimum Thickness of Protective Clothing in a Way of Improvement Based Particle Swarm Optimization
43	W2080	Enhancing Online Collaborative Filtering by Integrating Social Network
44	W1094	Integrate Information Inside Words to Improve Word Embeddings

Track 1—Human-Centered Computing

Session Chair: Prof. Hong Lin

Co-chair: Assoc. Prof. Qiu Wang

Venue: Salon IX | Time: 12:45-13:45

This track aims to serve as a forum for researchers in human-centered computing, affective computing, emotional intelligence, internet of things, genomic analysis, eHealth, and artificial intelligence in human-aspect areas, to disseminate their research ideas, discuss potentials of research methodologies, and cultivate possibilities of academic exchange and collaborations. Faculty and students in various areas of science, engineering, education, and humanities are welcome to use this platform to present their research results and seek in-depth insights into research topics through academic exchange and discussions. Research topics in inter-disciplinary and multi-disciplinary areas are especially welcome to be brought to this forum.

<p>W1136 12:45-13:00</p>	<p>Supporting Mindfulness Based Interventions with Social Virtual Reality</p> <p>Prof. Mark R. Costa, Joshua Felver and Rachel Razza Syracuse University, USA</p> <p>In this work in progress report, we outline the rationale, theoretical framework, and experimental design for a study focused on leveraging virtual reality to make mindfulness-based interventions more accessible to critical populations. Mindfulness-based interventions can help individuals manage stress and mitigate professional burnout but are often difficult to access due to time constraints and other limitations. We discuss some of the advantages of using virtual and mixed reality systems to reduce logistical burdens associated with practice as well as important factors to consider when designing a system for clinical interventions.</p>
<p>W1074 13:00-13:15</p>	<p>A Port Crane Strain Measurement System Using Integrated Foil Gauge</p> <p>Dr. Xiuzhong Xu, Xiancheng Gu, Congxiao Zhou Shanghai Maritime University, China</p> <p>A strain measurement system is designed to realize real-time monitoring of port crane strain and estimate the fatigue life of port crane. On the hardware side, the differential input of weak signal of ST350 strain sensor is realized by high-precision amplifier AD620, and the interference is filtered by two-stage filter. On the software side, the strain measurement system is developed based on C#. The system can acquire data and store it to the SQL Server database. 8-level load spectrum of port crane is compiled based on MATLAB to estimate the fatigue life of port crane. The interface program is written by VB.net to transmit the acquired data to the PI System. The PI System can store the data and publish the condition of port crane to the web page. The test results show that the performance of strain measurement system real-time is good, the accuracy of the integrated foil gauge is good, the fatigue life of port crane can be effectively estimated.</p>
<p>W1309-A 13:15-13:30</p>	<p>Introspective Human-Centered Computation and Latent Statistical Modeling on Intensive Contemplative EEG and fNIRS Measures</p> <p>Assoc. Prof. Qiu Wang Syracuse University, USA</p> <p>Using the introspective research model (Wang and Cheng, 2018), this paper will discuss the main challenges that need to be addressed in latent variable based contemplative research, specifically the human-centered computing and statistical modeling on intensive brain measures. First, we will review the philosophical roots of contemplation, operationalization and dimensionality of the latent construct of mindfulness, followed by a brief synthesis of the research design and statistical modeling found in recent human-centered computing literature and empirical studies. After discussions of explicit-macro and implicit-micro explorations in contemplative research, we will</p>

	<p>examine the rhythm decomposition of Electroencephalogram (EEG) and the signal visualization of functional near-infrared spectroscopy (fNIRS) data collected in physio-psychological contemplative conditions. Finally, we demonstrate the structural equation modeling based time-series analysis for human-centered computing and causality inference to estimate intervention effect using EEG and fNIRS data collected in contemplative practices.</p>
<p>W1133 13:30-13:45</p>	<p>Thanking with Skin</p> <p>Phuong Huynh, Gregory Warner, Prof. Lin Hong University of Houston-Downtown, USA</p> <p>Brain-computer interfaces have been investigated for more than 20 years and have great potential to develop applications for physicians to diagnose diseases or patients with severe neurologic disabilities to return to interact with society. To gain those purposes requires technics to analyze the EEG data as well as an algorithm to train the model for identifying the patterns or controlling the devices. TensorFlow is a machine learning developed by Google team for internal use and was released for public use in 2015. Since it can train and test on deep learning neural network, it can be used for EEG data. This project used TF-Keras and TensorFlow-DNN to train the models for classifying brain states using EEG data. Neurosky Mindwave Mobile headset and a new device developed from Micro: bit were the recorders for EEG signals in the project. Several technics such as min-max normalization, Ensemble Empirical Mode Decomposition (EEMD), extraction were applied to analyze the recorded EEG data. The results show that the accuracies of TensorFlow-Keras and TensorFlow -DNN models are 97% while the results from XGBoost is 98% when classifying the EEG data from Micro: bit device. The result confirms the ability of application of TensorFlow in identifying EEG data. The technics for processing data contributed to the above results are min-max normalization and data extraction. Moreover, we also verify that the low-frequency drifts in the recorded data is essential to identify the brain states using EEG data. The results also show the application of IMFs generated from EEMD technic as features to build the models for classifying brain states using the EEG data.</p>

Session 1—Data Analysis

Session Chair:

Venue: Salon V | Time: 12:45-14:45

Note:

- * The certification of Oral Presentations will be awarded after each presentation.
- * For the Best Presentation of each session, it is encouraged to award to student author prior at the end of each session. Best presenter will be awarded at the dinner banquet.
- *To show the respect to other authors, especially to encourage the student authors, we strongly suggest you attend the whole session, the scheduled time for presentations might be changed due to unexpected situations, please come as early as you could.
- *Session Photo will be taken at the end of the session.

W2012 12:45-13:00	<p>Sentiment Analysis of LMS Users Using Support Vector Algorithm</p> <p>Ms. Evelyn M. Baesa, Rosemarie T. Bigueras, Josephine Dela Cruz, Daniel E. Maligat Jr., Jocelyn O. Torio Camarines Norte State College, Philippines</p> <p>This Higher education institutions are now being transformed by digital technologies in terms of administrative operations and delivery of instruction using learning management systems (LMS). This study aims to determine and understand the faculty and students' perceptions, experiences, expectations and concerns regarding educational uses of learning management systems (LMS). Qualitative research method was used to better understand the faculty and students' perceptions, expectations and concerns about LMS, responses from two (2) open-ended online survey questions was used as a primary source of data. For the statistical method which is also embedded in the processing technique, Support Vector Machine was used to validate the correctly classified instances. The study reveals that faculty and students exhibited positive perceptions in practicing and using learning management systems while the biggest expectations of faculty and students are assessment feature, discussion, accessibility, interface and hardware and software. The result of this study reveals that the perception achieved an average accuracy of 91.8182 %. Based on the findings of expectations and concerns, LMS must consider assessment feature, discussion, accessibility, interface and hardware and software to be an effective e- learning tools.</p>
W2025 13:00-13:15	<p>Warehouse Management System with Customer Analysis for RichB Trading</p> <p>Rosette Joyce Ramirez, Angelica Bustamante, Kim Hanna Llamera, Bernadette Reyes, Assist. Prof. John Benedic Enriquez Far Eastern University – Institute of Technology, Philippines</p> <p>The Research was about the warehouse management system is made to be more efficient to both business and their customers. It helps the business to manage the sales, inventory, deliveries, and orders that are happening inside and outside of the warehouse. The system has two parts; online ordering and main system or the warehouse management system itself. Through online ordering, it is easier for both customers and sales agents to take orders or purchase products. In the main system, there is SMS where the system sends a confirmation message to the customers and they can reply to that message. As for analytics, the system has Sales Analytics where daily, weekly, monthly and yearly sales generated, Customer Analysis to improve the relationship between customers and business, Market Basket Analysis to determine what items are frequently bought together, Sentiment Analysis to identify and categorize the comments of the customers and Forecasting Analysis to predict the 5 years' sales per product category.</p>
W2028 13:15-13:30	<p>The Influence of Information Integration on Hotel Performance through the Green Operation and Strategic Purchasing</p>

	<p>Mr. Hotlan Siagian, Zeplin Jiwa Husada Tarigan, Fransisca Andreani Petra Christian University, Indonesia</p> <p>Today, the tourism industry is one of the cores of the Indonesian economy. The growth of this industry has increased the number of a hotel located in the tourism place such as East Java of Indonesia. The rivalry among the hotel become unavoidable and even more intensified. On the other hand, the customer requirement has shifted to the environmental issue. Hence, the hotel's management has no choice other than to enhance the awareness of the management of environmental issues. This study examines the effect of information integration on hotel performance through strategic purchasing and the green operation. Data collection was performed by distributing 75 questionnaires representing 75 hotel. The respondents are the permanent employee involved in management levels such as supervisor or manager. The result suggested as follow: 1) The information integration affects the hotel performance, 2) The information integration influence the strategic purchasing, 3) The information integration affects the green operation, 4) The strategic purchasing influences the green operation, 5) The strategic purchasing affects the hotel performance, 6) The green operation affect hotel performance. The additional finding from this research can be drawn as follow: 1). Strategic purchasing mediates the effect of information integration on the hotel performance, 2). Green operation mediates the effect of information integration on hotel performance. The study provides an insight for the manager on how to enhance hotel performance from the point of SCM (Supply Chain Management).</p>
<p>W2069 13:30-13:45</p>	<p>Mining Social Media Data of Philippine Higher Education Institutions Using Naïve Bayes Classifier Algorithm</p> <p>Prof. Joey S. Aviles, Rosanna A. Esquivel Panpacific University North Philippines – Tayug Campus Inc., Philippines</p> <p>Higher Education Institutions in the Philippines integrate social media like Facebook to market their brand, give some announcements, update news and other important information about their institution. However, their stakeholders create unofficial Facebook pages associated to their institution. These pages are areas for students mostly to react to posts, comment, give their opinion on a given topic and share their daily life online in an informal and casual way. These social media footprints were used in the data mining process to identify their discourse. With this, Universities and Colleges could form decision-making mediations and improve the quality of education and service they provide. The specific objectives of this study are: to create a workflow on how to analyze social media data; to use Naïve Bayes Algorithm in classifying the discourse of Philippine HEI stakeholders; and to deduce the results of data mining and recommend intervention activities to improve quality education. Knowledge Discovery Databases (KDD) was used in the study. The result of the data mining process is displayed through a word cloud and a dynamic graph visualizing the classifications of posts and comments. Social engagement, academics, emotions, health, policies and finances were identified as the SM discourse of Philippine HEI Stakeholders.</p>
<p>W3019 13:45-14:00</p>	<p>GradsCOOL: A Learning Management System for Bulacan State University Graduate School</p> <p>Assoc. Prof. Raquel Concepcion Adriano, Marian Minneli Santos Cruz Bulacan State University , Philippines</p> <p>Information and Communication Technology (ICT) plays a vital role in the curriculum design of the various educational institutions. It provides vital ways to improve the teaching and learning approach, making available resources easy to share and acquire. The major problem of the study was to develop learning management system for the Graduate School of Bulacan State University. It made use of ADDIE system development model, which consists of five phases: (1) analysis; (2) design; (3) development; (4) implementation; and (5) evaluation. Significantly, gradsCOOL</p>

	<p>(graduate school COLlaborative Outcome-based Learning) is a Learning Management System (LMS) characterized by the following essential features: (1) centralized learning management; (2) mobile learning; (4) course management; and (5) tracking and reporting. Its acceptability was examined from multiple perspectives with respect to its (1) functionality; (2) reliability; (3) usability; (4) maintainability; and (5) portability. Moreover, considering learning management system as an important factor in successful ICT implementation in Higher Education Institutions (HEIs) setting, with the incorporated significant features and the acceptability of the software, it was recommended that this new mode of instruction be implemented in Graduate School of Bulacan State University. The adoption of the developed LMS into teaching and learning is of great importance as the school moves towards changing its delivery method to include a component of online learning, enhancing the delivery of instruction achieving better outcomes.</p>
<p>W1021 14:00-14:15</p>	<p>Replication Based on Data Locality for Hadoop Distributed File System</p> <p>Ms. May Phyo Thu, Khine Moe Nwe, Kyar Nyo Aye University of Computer Studies, Myanmar</p> <p>Replication plays an important role for storage system to improve data availability, throughput and response time for user and control storage cost. Due to different nature of data access pattern, data popularity is important in replication because of the unstable and unpredictable nature of popular files. Also, replicas placement is important in consideration of system's performance. In data-parallel applications, data locality is a key issue and this consequence of this issue occurs the decrement of system' performance. Therefore, this paper proposes a data locality-based replication for Hadoop Distributed File System (HDFS). In replica allocation, data popularity is considered for maintaining less replicas for unpopular data and also, disk bandwidth, CPU utilization and disk utilization are considered in the proposed replica placement algorithm in order to get better data locality and more effective storage utilization. Our proposed scheme will be effective for HDFS.</p>
<p>W1075 14:15-14:30</p>	<p>IoT enable Low-Cost Implementation of Data Center Infrastructure Management System</p> <p>Mr. Nguyen Trong Thuong and Yu Kun-Ming Chung Hua University, Taiwan</p> <p>For any Data Center, environment and equipment monitoring for power and cooling in Data Center is very important. Thus, all Data Center need monitoring systems to help operators in their works. Currently, each type of equipment has their own monitoring system, provided by that equipment carrier. So, to monitoring whole devices in Data Center, people have to use many separated systems. To solve this issue, we apply IoT technique for connecting all devices into one real-time monitoring system, which help to save server resource and more convenience for operator.</p>
<p>W1115 14:30-14:45</p>	<p>Corn growth prediction for the upcoming season in Burkina Faso. Authors: Eman Bakheet and Dr. Andrew Gravell</p> <p>Mr. Zina Lacina, Dr. Sun Yi Kobe Institute of Computing, Japan</p> <p>The economy of many African countries depends heavily on agriculture, forestry and livestock farming, as well as the exploitation of mineral resources. In Burkina Faso, Traditional cereals, such as sorghum and millet, dominate food consumption and expenditure of rural households, while urban households prefer rice and maize. However most farmers today are smallholder or subsistence farmers who grow crops and rear animals just to feed themselves and their families. The lack of information remains the number one problem facing most scale farmers today. Nowadays there are many available platforms that we can retrieve information such as weather information, soil information, yield information that can be used to build a strong prediction platform. It is</p>

	<p>from there that we came out with our prediction idea based on Corn and extended to other crops in the future work. The solution is a web application and mobile application that will be deployed on the AWS cloud provider. The farmers can install or access from their smartphone or laptop, and based on their geo position the application provides information about the upcoming season. The application is a microservice application combines with machine learning tool such as Scikit Learn. To put in place this solution we use many procedures (extract, clean and store the dataset), technologies (docker, cloud), programming languages (Flash, Python) and classification methods (Adaboost, Random Forests, OLS) to make for the end users accurate predictions. Historic weather conditions were downloaded using API services from the Darksky.net from 2005 to the current day and then combined with the data of corn for each province since the same interval date coming from multiple sources AGRA, ministry of Agriculture, this combined output is used for the training data. The prediction is for each coming agriculture season in the country.</p>
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Session 2—Control System

Session Chair:

Venue: Salon VI | Time: 12:45-14:45

Note:

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<p>W2013 12:45-13:00</p>	<p>Apron Conflict Prediction and Avoidance for Aircraft in Large Airport</p> <p>Dr. Xinping Zhu, Haiyao Xu Civil Aviation Flight University of China, China</p> <p>In order to ensure the safe operation of apron, it is necessary to implement apron control system integrated with advanced movement conflict control algorithm. Six classes of apron conflicts that may occur in apron operation are summarized, and the corresponding characteristics are analyzed in detail. The approach for constructing static network graph (SNG) based on virtual control node, and dynamic network graph (DNG) for aircraft apron movement are provided with the prior information on taxi routes, respectively. The concept of apron movement cycle, cycle chain, and shareable unidirectional route in DNG are proposed, and the apron conflict prediction and avoidance algorithm was proposed for apron conflict type 1-4. Lastly, the effectiveness of the proposed algorithm was validated through numerical study and simulation experiment.</p>
<p>W2020 13:00-13:15</p>	<p>A Novel Fatigue Monitoring Evaluation System for Air Traffic Controllers</p> <p>Yonggang Yan, Guozhuang Pan, Assoc. Prof. Zhiyuan Shen Nanjing University of Aeronautics and Astronautics, China</p> <p>According to the domestic and foreign security agencies, at least 70% ATC' man-made incidents are directly or indirectly caused by fatigue, therefore ATC' fatigue has become a hot issue in the field of civil aviation safety management at home and abroad. In this paper, it firstly introduces the general situation of fatigue for ATCs and its related causes. Then, based on investigations and collected expert opinions, the evaluation system of fatigue monitoring for ATC is established. The weights of monitoring indicators are calculated by using the judgment matrix obtained by expert scoring method. Finally, a case study shows the feasibility and validity of the evaluation system.</p>
<p>W11001 13:15-13:30</p>	<p>Implementation of Ziegler Nichols Tuning Method on Pid Controller for Dc-Dc Boost Converter Used In Horizontal Axis Wind Generator</p> <p>Conrado Ostia, Prof. Esperanza Chua Mapúa University, Philippines</p> <p>Growing demand of using wind turbines for harnessing energy has become a trend throughout the years. This study proposes the use of DC-DC boost converter tuned with Ziegler Nichols PID controller for stable maximum power output of the horizontal axis wind turbine. Developing the design of the turbine has been tackled; however, is not the only solution. It is known that varying wind affects the performance of the wind turbine. However, application of the tuned DC-DC boost converter provides various solutions to this problem and one factor that can maintain the turbine to its maximum operation. Ziegler Nichols tuned PID learns from the error given by the wind turbine and corrects it</p>

	<p>thus getting the maximum voltage. It is also known for faster transient response but has high overshoot. Testing the turbine with varying wind speed, the results showed that it reacts, corrects and boost the voltage for a short period of time using this Ziegler Nichols Tuning parameter.</p>
<p>W2021 13:30-13:45</p>	<p>An Optimizing On-duty Scheduling of Air Traffic Controller Considering Fatigue Factors</p> <p>Yonggang Yan, Guozhuang Pan, Assoc. Prof. Zhiyuan Shen Nanjing University of Aeronautics and Astronautics, China</p> <p>As the rapid development of the world's civil aviation and the rapid increase of flights in recent years, the fatigue of the controllers has become a challenges in the field of civil aviation safety management. The state-of-the-art on-duty scheduling methods are hardly considering the ATC fatigue. Firstly, this paper introduces the definition of fatigue and its influence factors. Then, the causes of fatigue and the influence of on-duty scheduling based on ATC fatigue are emphatically analysed. Then, the mode and restrictive factors of on-duty scheduling are explained. Finally, according to the collected data from area zone control unit in Xinjiang Bureau of CAAC, an optimize Scheduling for Air Traffic Controller is given. This paper provides the control unit theoretical guidance to the analysis and mitigation of the controllers fatigue, and further enriches the theory of the fatigue management of the controllers.</p>
<p>W11002 13:45-14:00</p>	<p>Low-Cost Wave Profiling Device for Transverse Wave Characterization</p> <p>Mr. Conrado F. Ostia, Jr., Allen Abarquez, Kim Barlongo, Marc Joseph Ferrer, Jose Villa, Glenn Magwili Mapúa University, Philippines</p> <p>This study focused on the design and construction of a Low-Cost Device with Data Logger using Arduino Microcontroller capable of profiling the transverse wave. Series of low-cost potentiometers were used as sensor in profiling the transverse wave. The device resembled a long boat with two floaters on each segment that is deployed on the pool and sea. Results showed that the integrated measurement system was able to give statistically accurate data. Furthermore, the final prototype was able to profile a wave in terms of its sinusoidal attributes, i.e. amplitude (height), frequency and period.</p>
<p>W1019 14:00-14:15</p>	<p>Energy Conversion Mechanism and Parametric Analysis of Free Piston Engine Generator</p> <p>Mr. Yanxiao Li, Jun Yang, Zhengxing Zuo and Yuan Chu Shandong Jiaotong University, China</p> <p>The simulation model for free piston engine generator was set up in Matlab/Simulink and the working process simulation was conducted. According to the dynamic characteristic of the system, the energy conversion process was simplified in different stages of one stroke. On that basis, the effects of design parameters on the energy conversion process and operating state were analyzed.</p>
<p>W1076 14:15-14:30</p>	<p>Ultrasonic Sensing System for Detecting Mixture of Water and Sugar Adulteration in Honey</p> <p>Mr. Glenn Magwili, Aileen Nieva, Ronald Joshua Delo, Jerrico Munar, John Micson Lunas, John Karlo Padilla Mapúa University, Philippines</p> <p>Adulteration in honey may cause various complications in human health. This paper proposed an ultrasonic sensing system for detecting mixture of water and sugar adulteration in honey. The system used a simple ultrasonic sensor which is non-invasive compared to previous studies and procedures for adulteration detection. The system was calibrated with honey from Pampanga, Philippines, which were then tested in a</p>

	<p>laboratory for authenticity before deliberately adulterated for testing. The system is calibrated and optimized with honey samples from 0% adulteration to 40% adulteration with 10% interval. The gathered data was used to generate an equation to calculate the percent amount of adulteration in honey. The equation is $y = -1.3507x + 743.89$. The system accuracy obtained during actual testing which is 92.38%. The system is delimited only to a specific variant of honey present in Pampanga.</p>
<p>W1079 14:30-14:45</p>	<p>Distance-aware Influence Maximization Algorithm based on Random Walk</p> <p>Ms. Yuwei Wang, Ling Chen Yangzhou University, China</p> <p>In this paper, we investigate the distance-aware influence maximization problem on the independent cascade(IC) model. A random walk based algorithm is presented to find the seed set to maximizing the influence for a distance aware query. Random walk method is used to perform path sampling to simulate the influence propagation process. Based on the result using random walk method, greedy method is used to select the seed set. Our experimental results show that the algorithm can reasonably select the seed set to maximize the influence propagation.</p>

Session 3—Software Engineering

Session Chair:

Venue: Salon VII | Time: 12:45-14:45

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<p>W2040 12:45-13:00</p>	<p>A Development of an Education Game for Learning a Concept of King Bhumibol's Philosophy of Sufficiency Economy</p> <p>Assist. Prof. Worasit Choochaiwattana, Winyu Niranatlamphong, Anuwat Ruttanasomboon, Wicha Charoensuk, Phattara Rattanamoranon, Aurawan Imsombat, Jittanard Sangkrajang Dhurakij Pundit University, Thailand</p> <p>Using technology to enhance learning is increasingly popular. An educational game shows positive impacts on learners. This paper aims at developing an educational game for learning a concept of King Bhumibol's Philosophy of Sufficiency Economy. The game, named "Thai Farmers' Way of Life" is developed. It comprises of three stages that are Stage 1 Artificial Rain, Stage 2 Wastewater Treatment, and Stage 3 Soil Aggravation. This game simulate a life of Thai farmers. Thus, the player must turn an empty farmland into a plentiful farmland using the "New Theory of Agriculture". The evaluation results show that this interactive education game help its player to understand the King Bhumibol's Philosophy of Sufficiency Economy.</p>
<p>W2070 13:00-13:15</p>	<p>Usability Chemical Application Based On User Experience Analysis</p> <p>Assist. Prof. Alexander Setiawan, Silvia Rostianingsih Petra Christian University, Indonesia</p> <p>An experience in making a usability chemical application is one of the results that will be produced by humans who interact with machine learning. Based on this experience contains various the things that can be learned, by namely designing the interface of the mobile application. From the results of this study, user experience is highly elaborated, especially for basic human needs in carrying out an activity in the use of mobile applications. In the usability factor, experience of this factor is very important in determining the effectiveness and efficiency of the system, technology, or environment around the user. The results of this study will produce a form of experience for human needs and the concept of usability and user convenience in mobile applications. The results of this interface chemistry study will benefit from the user experience in generating observations in chemistry in a graphical user interface that serves as a media interface and mobile application by completing a usability approach to user experience by testing applications to multiple cellular devices by utilizing the needs of these users.</p>
<p>W1042 13:15-13:30</p>	<p>Usability Tests of Thai Mobile Banking UI Design</p> <p>Dr. Inthraporn Aranyanak King Mongkut's Institute of Technology Ladkrabang Bangkok, Thailand</p> <p>Nowadays, many banking customers process their transactions via mobile banking applications because of the convenience. This study examines five well-known Thai mobile banking applications to measure their usability and compares their UI design from the perspective of nine main functions. An analytical tool for prototypes and the</p>

	<p>System Usability Scale (SUS) were used to collect and analyse data. The usability test of the five mobile banking applications in this paper involves three usability metrics: effectiveness showing the completion rate, efficiency showing the time used to successfully complete a task, and satisfaction using SUS to evaluate users' satisfaction with the product. This paper presents problems found in poor UI design and suggests how to improve mobile banking UI design.</p>
<p>W2066 13:30-13:45</p>	<p>Museum Interactive Edutainment Using Mobile Phone and QR Code</p> <p>Assoc. Prof. Tanti Octavia, Andreas Handojo, Welly Tedja Kusuma, Timothy Christian Yunanto, Richard Lawrence Thiosdor, Daniel Petra Christian University, Indonesia</p> <p>People often regard the museum as a boring place, something old-fashioned, not interesting place to go, and do not have a correlation with the present. In fact the museum is a good place as a source of learning about human history and culture. This research try to build museum interactive edutainment (education and entertainment) application using mobile phone apps and QR code. This application will provide additional interactive information about the museum artefacts. Museum visitors could find this information by scan the QR code that attach to the museum artefact. The application will do the scanning process simply by using mobile phone camera. This QR code ID then sent to the server to receive artefact additional information such as text, image, sound, and video. This application already tested to 162 museum young visitors, the results is 75.9% respondents find that this application very interesting as a learning media.</p>
<p>W1055 13:45-14:00</p>	<p>A Case Study of Applying Rigorous Testing in Practice</p> <p>Yufeng Xue, Dr. Lan Lin, John C. Tucker, Becky Hammons, Michael Wolfe Ball State University, USA</p> <p>This paper reports on experiences and preliminary results we obtained through a case study, in which we applied a rigorous testing method, namely statistical testing based on a Markov chain usage model, to a real-world testing problem in an industrial setting. Although model-based statistical testing has been around for more than two decades with well-established theory and engineering practices, it remains problem- and application-specific to develop a workable testing solution and framework that enables automatic test case generation-execution-evaluation, to provide meaningful and quantifiable statistics/data to make informed management decisions, and to support software certification. We describe the challenge involved in testing an Interactive Voice Response (IVR) module, and demonstrate our approach to tackle the problem following statistical testing practices, from usage modeling all the way to the test case analysis.</p>
<p>W1081 14:00-14:15</p>	<p>Experimental Design Based Method for Influence Maximization</p> <p>Mr. Yuliang Zhang; Ling Chen Yangzhou University, China</p> <p>In this paper, we investigate the influence maximization problem on the independent cascade(IC) model. An experimental design based algorithm is presented to find the seed set to maximize the influence in social network. In the method, we consider each node in the social network as an experiment, and the problem that choosing k seed nodes from the social network becomes that choosing the most representative k trials from all trials. We also take the situation about the similar nodes into account and try to make the similar nodes not as the seed at the same time. At last, we build the model and use the approach called cross-iteration to solve the problem. Our experimental results show that this method can effectively select the appropriate seed set to maximize the influence in the social network.</p>
<p>W2031 14:15-14:30</p>	<p>Improving SQL Query Response Time thru Client Side Processing in Client-Server Environment</p>

	<p>Mr. Ruben A. Parazo, James A. Esquivel Tarlac Agricultural University, Philippines / Angeles University Foundation, Philippines</p> <p>Queries executed by a client in the database server were profiled, managed and reused to respond to future subduced queries to be executed in the client. This technique not only reduced the number of queries to be processed by the database and the server but also contributes in decreasing the utilization of network, database and server resources because future subduced queries to be executed that are subduced from the previous executed query were responded locally. Conditions in the query were removed before sending to the database for evaluation in order to increase its effectiveness for its intended purpose. Profiled queries that are subduced by incoming query were purged including its corresponding result set while the incoming query was profiled in the repository. This was implemented as a technique to avoid storing redundant data in the repository as well as to avoid query capability duplication. Tests showed that utilization of a local repository of previous executed queries to respond to a subduced requested query decreased the latency incurred in fetching data both in small, medium and large number of records as compared to a requested query responded by a database and server where the data still travelled thru the network.</p>
<p>W2032 14:30-14:45</p>	<p>Proposed Forest Prediction System based on Large-scale Adaptive Boosting Support Vector Regression Method</p> <p>Dr. Li-Li Wang, Matthew R Evans The University of Hong Kong, China</p> <p>In this paper, a forest prediction system for incorporating large-scale data on individual trees into one hybrid model is proposed. The proposed algorithm incorporates both forest biometry and statistical information, and constructs the hybrid model through combining adaptive boosting classification and support vector regression learning from large-scale forest data. More specifically, the species of a tree is firstly identified based on its measured features by using the adaptive boosting method. Subsequently, for each tree species the system relates the height of trees to the diameter at breast height and annual mean temperature for each tree species through a Support Vector Regression technique. This allows the tree's height in the future to be well predicted. Experimental results show that the proposed algorithm has the capability to identify the species of trees and further predict tree growth through valid statistical inference.</p>

Session 4—Computer applications

Session Chair:

Venue: Salon VIII | Time: 12:45-14:45

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<p>W2011-A 12:45-13:00</p>	<p>Research on the Evolution of E-commerce Network Retail and the New Retail Transformation in China</p> <p>Mr. Bao-Yi Wang Shandong Jiaotong University, China</p> <p>China is experiencing a period of great revolution in retail industry, which is required by the construction of the new retail system. Online retail is an important support of the new retail. It is of great significance for us to understand the development of the new retail by investigating the evolution of online retail. China's online retail industry has experienced a development process of about 20 years, showing a continuous evolution, expansion and rich evolution of the format. On the whole, network retail can be divided into five stages, including the embryonic stage (1999-2002), the rising stage (2003-2007), the outbreak stage (2008-2012), the integration stage (2013-2015) and the sublimation stage (2016-present), each stage shows different characteristics. On the whole, the development process of China's online retail shows some characteristics and trends. First, it presents explosive growth characteristics. It is a kind of industry with typical high-speed growth genes. Second, the online retail industry presents an ever-enriching process, but on the whole, the trend of scale and deep professional services are the basic trend of development. At the same time, it is a kind of industry with typical characteristics of scale economy. Third, the new retail of deep integration of online and offline logistics is the basic trend and the final destination of the development of online retail. In the new retail era, satisfying consumers' demands for quality, convenience, personalized consumption and comprehensive experience of shopping, entertainment and social interaction will become the basic direction of retail reform. The essence of the new retail is to take consumer demand as the core, to realize the deep integration of online and offline logistics by means of information technology, especially the mining and application of big data and the popularization of intelligent devices, to meet consumer demand. After more than two years of development, the new retail has changed from the first half dominated by demand-side reform to the second half dominated by supply-side and full-chain reform, which will drive the reform and reconstruction of supply chain in reverse direction.</p>
<p>W2027 13:00-13:15</p>	<p>The Effect of Middle Manager Engagement on SCM Performance through ERP System and SCM Practices</p> <p>Zepin Jiwa Husada Tarigan, Hotlan Siagian, Dr. Widjojo Suprpto Petra Christian University, Indonesia</p> <p>Partnerships will give a new demand for manufacturing companies to build a data integration system that can synchronize quickly. This condition will provide the company with best practices in carrying out the operations in an integrated manner with suppliers and distributors and customers. Supply chain integration (SCI) as a form of</p>

	<p>supply chain best practice is obtained by the implementation of technology enterprise resource planning (ERP) so that the data are obtained at the right time, complete and accurate. The supply chain best practices and the ERP can increase the supply chain management performance flow. The implementation of the SCM and ERP system is the responsibility of the middle manager. The distribution of questionnaires is carried out to 60 industries and 80 questionnaires, with a response rate of 74%, which can be further processed with PLS analysis. The results of the data processing show that the middle manager engagement is able to bring a positive impact on the implementation of ERP systems and SCM practices. Then, the middle manager engagement is able to bring a positive impact to the SCM performance by reducing the company's operational costs. The ERP system implementation in the company can have an impact on SCM practice and performance. The SCM practices that have been continuously impacting on SCM performance.</p>
<p>W2051 13:15-13:30</p>	<p>A Vectorization Model for Job Matching Application of a Government Employment Service Office</p> <p>Ms. Leah G. Rodriguez, Enrico P. Chavez, Christopher A. Rodriguez Pangasinan State University, Philippines</p> <p>The fast growth of the Internet caused a matching growth of the amount of available online information that increased the need to expand the ability of users to manage all this information. This encourages a substantial interest in specific research fields and technologies that could benefit the managing of this information overload. However, in the Philippines, it has been a challenge for most job agencies to find out and predict job matching intelligently due to lack of accurate models to be adopted. To address this problem, the researchers developed job matching application specifically for Pangasinan Employment Service Office (PESO). The aim is to know how these measures behave and whether they validate the idea that applicants' data have more in common with job profile. The process of matching an applicant with an offered job is performed through the use of vectorization model and cosine similarity. Large training sets of records of applicants and job profiles were used to define the weights of the parameters. The results show that the selection of cosine similarity measures and vector weights are significant in job matching application, especially in those where the applicants' information's likeness is measured.</p>
<p>W3005 13:30-13:45</p>	<p>Onset-Aware Polyphonic Piano Transcription: A CNN-Based Approach</p> <p>Sicong Kong, Wei Xu, Wei Liu, Ms. Xuan Gong, Juanting Liu, Wenqing Cheng Huazhong University of Science and Technology, China</p> <p>Automatic music transcription (AMT) transforms the musical audio content into symbolic notations, including onsets, offsets and pitches. In this paper, we designed a polyphonic piano transcription system based on Convolutional Neural Network (CNN), and it improves the note-level results. Our proposed method has two advantages: Firstly, A CNN model is used to detect the onset event and align the onsets of the notes into more accurate position. Secondly, the other CNN model is used to detect the onsets of 88 notes. And we improve the model's performance by using dual-channel spectrogram as input, appropriate number of convolution layers and the weights for the positive samples in loss function. The public dataset of MAPS is adopted to train and evaluate. Finally, in the 'ENSTDkCl' subset, our proposed solution achieves 85.15% on note-level F1-measure. To the best of our knowledge, the result is highest F1-measure scores in the state of art.</p>
<p>W1085 13:45-14:00</p>	<p>Evaluation of Customer Preferences for Ready-to-Cook Dried Pork Product Attributes Using Conjoint Analysis</p> <p>Mr. Pelapon Suwanacheep and Rungchat Chompu-inwai Chiang Mai University, Thailand</p>

	<p>In developing ready-to-cook dried pork products which can provide satisfaction to consumers, it is necessary to know to which product attributes consumers give their preferences. This research has the objectives of analyzing product attributes of ready-to-cook dried pork products which affect consumer purchasing preferences with the techniques of Conjoint Analysis. The research methodology starts by seeking product attributes and their levels with Focus Groups. The attributes obtained were used to create a questionnaire and collect data from a sample group of 200 individuals. In their responses to the questionnaire, respondents were asked to rank a list of combinations of product attributes according to their satisfaction. This data was then analyzed for utilities values to find which product attributes contributed to consumer satisfaction and at what level. The results found that the most important attributes were flavorful taste, followed by standards of guaranteed tastiness, a price of 200 baht/kg, type of pork meat used being either all lean or lean and fat and sodium levels in low-sodium products.</p>
<p>W11006 14:00-14:15</p>	<p>Prediction of Shandong Province Industrial Land Quantity Based on ANN and Python</p> <p>Assoc. Prof. Bi He Shandong Jiaotong University, China</p> <p>Land is the basic resource for human survival and development, as an important type of land, industrial land is the carrier of human production, efficient use of industrial land is an important guarantee for human production. Shandong province is one of the most important industrial provinces in China, which has a great demand for industrial land, therefore, the prediction of industrial land use is the premise of rational land use. In this paper, the GDP of shandong province, industrial output above designated size and fixed asset investment were taken as input values, and industrial land quantity was taken as output to construct the artificial neural network model, the historical official statistics from 2001 to 2015 were used as the training values, and Python was used as the calculation tool to train the model, after the process, the relevant parameters of model were obtained, and precision of the model was analyse. Finally, the land use volume in the future was predicted with the trained model, and the predicted results can be used as a reference for land use planning.</p>
<p>W1044 14:15-14:30</p>	<p>Development of an Automated Compact Wastewater Treatment Facility in Mapúa University Canteen Area with pH and Dissolved Oxygen Monitoring</p> <p>Mr. Glenn Magwili, Aileen Nieva, Ronald Joshua Delo, Jerrico Munar, John Micson Lunas, John Karlo Padilla Mapúa University, Philippines</p> <p>The lack of proper monitoring of wastewater parameters may result to non-conformance to effluent regulatory standards. The aim of this study was to fully automate a compact wastewater treatment with pH and Dissolved Oxygen Concentration monitoring for Mapúa University’s canteen. The wastewater parameters that were considered were BOD, COD, TSS, and pH level. The prototype was built through the characterization of the canteen’s effluent by which unit treatment operations performed were formulated. Furthermore, automation was applied using Programmable Logic Controller (PLC) and was monitored using Open Platform Communications (OPC)-based Graphical User Interface (GUI). Using t–test on the prototype’s effluent parameters, it was found that -7.77, -7.74, -8.78 were the resulting t-values for BOD, COD, and TSS respectively compared to the -1.76 critical value. It was proven in these findings that the effluent’s wastewater parameters were less than that of the DENR’s effluent standards under DAO 2016-08 pursuant to RA 9275 (Philippine Clean Water Act of 2004). Thus, the prototype was proven capable of treating the canteen’s wastewater .</p>
<p>W1080 14:30-14:45</p>	<p>Integrated Quality and Material Flow Cost Accounting (MFCA) Analysis of Production System</p> <p>Ms. Apisada Youngin and Wichai Chattinnawat Chiang Mai University, Thailand</p>

	<p>Target detection algorithm in hyperspectral imaging detects a certain material in a hyperspectral image using a known spectral signature of the material. Conventional algorithms for target detection assume that there is only one known target spectrum so target statistics cannot be estimated. Discriminant analysis is designed for classification, but this paper analyzes the performance of discriminant functions for target detection. The discriminant functions have been modified for target detection and uses simulated target spectra with different amount of random noise. Experimental results show that the algorithms can work well within a certain amount of noise.</p>
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Coffee Break
14:45-15:00

Session 5—Computer Technologies

Session Chair:

Venue: Salon V | Time: 15:00-17:00

Note:

- * The certification of Oral Presentations will be awarded after each presentation.
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<p>W2073 15:00-15:15</p>	<p>Introducing Extended DEMO Construction Model to RPA application</p> <p>Ms. Xiaohan Tian, Junichi Iijima Tokyo Institute of Technology Japan, Japan</p> <p>Business Process technology has long been discussed in various business process methodologies with diverse perspectives. Among them, the discussions on were mainly limited only in effectively fulfilling functional, informational and organizational aspects. For enriching the discussion scope, from DEMO (Design and Engineering Method for Organizations) perspective, this research extends to capture both human interactions and human capabilities aspects in the business process and the relating modeling methodology is also provided. For contextualizing our proposal, RPA (Robotic Process Automation), as one of the typical new application in freeing human workers from tedious and repetitive tasks, is adopted as an illustration example of our artifact development. Also, our proposed modeling methodology is evaluated in a deep-dive field study with a Chinese Bank X to testify the utility in analyzing and identifying applicable tasks for RPA adoptions and eventually delivering the business process model.</p>
<p>W11001 15:15-15:30</p>	<p>Implementation of Ziegler Nichols Tuning Method on Pid Controller for Dc-Dc Boost Converter Used In Horizontal Axis Wind Generator</p> <p>Glenn V. Magwili, Prof. Esperanza Chua Mapúa University, Philippines</p> <p>Growing demand of using wind turbines for harnessing energy has become a trend throughout the years. This study proposes the use of DC-DC boost converter tuned with Ziegler Nichols PID controller for stable maximum power output of the horizontal axis wind turbine. Developing the design of the turbine has been tackled; however, is not the only solution. It is known that varying wind affects the performance of the wind turbine. However, application of the tuned DC-DC boost converter provides various solutions to this problem and one factor that can maintain the turbine to its maximum operation. Ziegler Nichols tuned PID learns from the error given by the wind turbine and corrects it thus getting the maximum voltage. It is also known for faster transient response but has high overshoot. Testing the turbine with varying wind speed, the results showed that it reacts, corrects and boost the voltage for a short period of time using this Ziegler Nichols Tuning parameter.</p>
<p>W1087 15:30-15:45</p>	<p>Analysis of Supply Chain Network Design Model with Quality Cost</p> <p>Mr. Worrasete Tansurat and Wichai Chattinnawat Chiang Mai University, Thailand</p> <p>Designing the supply chain network model that takes into account product quality could be one of the most key factors that significantly improve the performance of</p>

	<p>organizations and also affects the most customer satisfaction in a long-term period. However, this model is based on a single product and a single production stage. This paper aims at designing a three-echelon supply chain model including multiple suppliers, multiple manufacturers with multi-stages inspection, and multiple customers. The mathematical problem is formulated with Cost of Quality (COQ) integrated into Supply Chain Network Design (SCND) to minimize the total supply chain cost involving transportation costs and production costs. Further, the paper proposes a meta-heuristic called Particle Swarm Optimization algorithm used to solve the model for the supply chain lot size and sampling inspection strategy. From the numerical data of the case study, the developed technique can determine the minimum of total supply chain cost at quality inspection 30.95%</p>
<p>W11007 15:45-16:00</p>	<p>A Deterministic Policy Gradient Based Load Control Policy in Direct Current Distribution Networks</p> <p>Mr. Hong Duan, Xu Zhou, Xianhong Kang, Zhongjing Ma Beijing Institute of Technology, China</p> <p>Developing algorithms for global optimum seeking of non-convex optimization problems has special potential in the real world. Previous researches in this field suffer from resulting a local optimum or losing some accuracy by convex relaxation. In this paper, we consider a demand side management (DSM) problem in direct current (DC) distribution networks as an application to study the global optimum seeking of non-convex optimization. Due to the voltage and network constraints, non-convexity appears in the objective function taking into account the tradeoff between the operation costs and users' preferences. By the freedom to express learning problem as a non-convex optimization, we explore a deterministic policy gradient (DPG) based algorithm to calculate the global optimum. A policy network and a polynomial regression critic are built to learn the optimal policy under an exploration noise. Numerical results are provided to demonstrate the DPG algorithm increasing the probability of convergence to the global optimum.</p>
<p>W1086 16:00-16:15</p>	<p>Prediction of Shandong Province Industrial Land Quantity Based on ANN and Python</p> <p>Glenn V. Magwili, Prof. Esperanza Chua Mapúa University, Philippines</p> <p>Searching for energy sources that poses less environmental impact and can be sustained for a certain time leads to renewable energy. Many people are familiar with the usage of ambient renewable energy source, including solar and wind, hence, taking for granted wasted energy sources, such as vibrations. The idea of harvesting energy from any type of vibration, whether it is physically created, mechanically generated, or electromagnetically produced, is now possible due to the discovery of piezoelectric effect. The aim of this study was to harness vibration energy from a piezoelectric cantilever beam through a waist-high tripod turnstile and magnetic flywheel. The prolongation of magnetic flywheel that harnessed and stored electrical energy was also investigated. In this study, the prolongation of rotation of the magnetic flywheel was achievable by multiple actuations in the waist-high tripod turnstile. A maximum increase of storage capacity of 4.455% from an initial storage of 2.563% was harnessed and stored from the setup. The harnessed and stored electrical energy accounted for supplementary source of energy for other primary sources of electrical energy.</p>
<p>W1057 16:15-16:30</p>	<p>Heterogeneous Ontology Merging Using Formal Concept Analysis</p> <p>Ms. Jaturada Deeying, Wiwat Vatanawood Chulalongkorn University, Thailand</p> <p>The increasing of ontology usage caused some overlapping ontologies which motivates knowledge engineers to enable the collaborative use of similar ontologies. It introduces the concept of ontology merging. Unfortunately, there are a few researches on</p>

	<p>heterogeneous ontology merging algorithm and most of them operated in the same or similar domain ontologies. In this paper, we aimed to merge heterogeneous ontologies on relevant domain using Formal Concept Analysis. We took DrugBank and Disease ontologies as our case study. The relationships between drug and disease are presented in this paper in the form of formal lattice. The result of this paper is the merged ontology of the given use case. The result was evaluated by comparing with the medication suggestion. The evaluation shows that the proposed method yielded a correct suggestion accordingly and it will be useful to support knowledge engineer to merge ontologies using corresponded attributes between ontologies.</p>
<p>W1093 16:30-16:45</p>	<p>Evaluation of Customer Preferences for Ready-to-Cook Dried Pork Product Attributes Using Conjoint Analysis</p> <p>Prof . Conrado F. Ostia, Jr., Carlos Marcelo A. Alvarez, Jerome L. Ani, Ross Albert S. Sangalang, Emmanuel Joseph J. Santiago and Jesus M. Martinez Jr. Mapúa University, Philippines</p> <p>One of the common electrical related accidents at home is electric shock due to misuse and mishandling of electrical plugs and sockets. This study presents the concept of a device that would somehow lessen the cases of electrocution among children, adolescents and adults. It aims to design an inductive plug-socket pair prototype in advancement to the existing conductive plug-socket pair. In the construction proper, considerations were focused on the size of the laminated silicon core and turns-ratio. To determine the characteristic of the prototype, measurement of the core and copper losses using no-load and short-circuit tests, respectively, as well as the computation of voltage regulation and efficiency of the prototype were done. The study came up with the size of the cores as 0.75 in x 0.75 in for the socket and 0.5 in x 0.5 in for the plug and number of turns as 2200 turns for the socket and 4400 turns for the plug. Performing no-load and short-circuit tests, the equivalent resistance and reactance of the inductive plug-socket pair were determined to be 47.2590 Ω and 144.6495 Ω respectively. Last but not the least, the efficiency and voltage regulation of the prototype were 61.85% and 31.42%, respectively, which showed as proof of concept of the feasibility of an inductive plug-socket pair device to be used for small appliances.</p>
<p>W2067 16:45-17:00</p>	<p>Mobile Technology for Volunteers in the Distribution of Natural Disaster Humanitarian Logistics: Case study on East Java Province Indonesian Red Cross</p> <p>Mr. Djoni Haryadi Setiabudi, I Gede A. Widyadana Petra Christian University, Indonesia</p> <p>On the events of natural disasters such as volcano eruptions, floods, landslides, tsunamis etc, volunteers play important roles in disasters management. The volunteers have to deal with the problem of managing the logistics to be distributed to the victims of the natural disasters. The logistics distribution for the victims of the disasters is hampered with the process of distributing goods from the central IRC (Indonesian Red Cross) to the shelters at the sites of the natural disasters. Often, the amount of goods sent, does not match with the amount of goods received. Sometimes the goods sent, also do not meet the needs of the victims due to the problems in data recording. There have not been many studies on this issue related to this kind of problems faced by volunteers. Some conducted studies, among others, were related to the logistics distribution methods, the speed of distribution, locating the shortest distance to the sites of the disasters. This study is developing a mobile application to facilitate easier logistics management between the Indonesian Red Cross, as the disaster management agency, the shelters and the volunteers at the disaster sites. The main focus is to meet the appropriate logistic requirements in sufficient quantity for the victims of the natural disasters. The result of this study is the development of a mobile application for volunteers able to accurately record all logistical needs and supplies at the disaster sites.</p>

Session 6—Communication System

Session Chair:

Venue: Salon VI | Time: 15:00-17:00

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<p>W2022 15:00-15:15</p>	<p>A Novel Fatigue Detection Method of Air Traffic Controller Based on Radiotelephony Communication</p> <p>Mr. Guozhuang Pan, Yonggang Yan, Zhiyuan Shen Nanjing University of Aeronautics and Astronautics, China</p> <p>With the rapid development of the civil aviation industry, the total number of civil aviation transportation flights has continued to increase. The requirements for safe operations and transportation efficiency have become higher. High-intensity work requirements make it easier for air traffic controllers to become fatigued during their stay. Based on the analysis of the current situation of air traffic controllers in civil aviation in China, a fatigue detection algorithm for air traffic controllers based on radiotelephony communication is proposed. In the proposed algorithm, an ATC voice recording is extracted as the parameters including short-term energy, short-term average amplitude, instruction time, short-term average power and short-term average amplitude difference. The extracted parameter are used to form fatigue detection model. Then the mapping relationship between the control voice data and the fatigue state is formed based on the quantified fatigue value of the matched controllers. Finally, based on the training and test data from Air traffic management Bureau at Shandong province, the efficiency of the proposed method is verified.</p>
<p>W3016 15:15-15:30</p>	<p>Design and development of an airborne biomedical signal device for urgent care situations</p> <p>Ioannis Panagopoulos, Mr. Panagiotis Katrakazas, Dimitrios Koutsouris National Technical University of Athens, Greece</p> <p>As the financial cost of electronics is constantly decreasing and new electronic modules are being introduced to the market, the development of many healthcare applications becomes easier, cheaper and more prospects are created for various healthcare related fields. Some of these fields are the pre-hospital care and the telemedicine, which have a lot to contribute to modern healthcare provision. The purpose of this paper is to present the development of an electronic biomedical device that will measure and send a number of biosignals, while at the same time being lightweight enough to be transferred by an unmanned air vehicle to achieve a better pre-hospital service in case of urgent care situations. The system was built trying to keep the total cost on a low level. Finally, some measurements were taken to check the device's proper functionality and conclusions were drawn.</p>
<p>W1008 15:30-15:45</p>	<p>Design of Delay Cell and DLL Based on CMOS 65nm Process</p> <p>Prof. Wenyuan Li, Yan Zhang, Pusheng Liu Southeast University, China</p> <p>With the development of analog integrated circuits, the characteristics of signal timing have a crucial impact on high-speed mixed-signal. Some delay cells can be designed to</p>

	<p>solve the delay differences and also they have been widely used in Delay Locked Loop (DLL), equalizer, and phased antenna arrays because it compensates the delay between the different signal paths. Moreover, the DLL's performance is largely determined by the delay unit. Therefore, the research and design of delay unit has important value and significance. The design and simulation are implemented by TSMC 65nm CMOS LP technology. DLL is made up of the Voltage Control Delay Line (VCDL), XOR gate phase detector and Voltage-Current (V/I) converter. The VCDL is implemented by cascading multi-level delay units, and the single delay unit uses active-inductor peaking technology to achieve wideband low-latency performance. The chip consumes a power of 31mW with 1.5V power and it occupies an area of 0.27mm² which including I/O pads. The delay time of designed single delay cell varies from 5.4ps to 7.1ps with 20% adjustment range within the bandwidth of 1-7GHz, showed from the post-layout simulation results. The design of the delay cell and DLL has some significance in the research of the low delay wide band delay circuit in the future.</p>
<p>W1302 15:45-16:00</p>	<p>Architecture for Disaster Relief Networks in Underground Coal Mines: A Survey</p> <p>Jie Gu, Pengfei Xue, Sheng Lin and Prof. Guopeng Zhang China University of Mining & Technology, China</p> <p>It is increasingly being recognized that dedicated emergency networks are vital interfaces between rescue teams and trapped-miners in underground mines. This article proposes a network architecture for rescue applications in post-disaster mines, termed as Post-Disaster Emergency Network (PDEN). First, the special requirements for configuring a PDEN are outlined. Then, the emergency data flows transported in a PDEN are classified into uplink flows and downlink flows. The problem of transmission priority differentiation for uplink flows, and the energy efficiency for downlink transmissions are both examined. Finally, some primary numerical results are presented to reveal the effectiveness of the proposed PDEN architecture.</p>
<p>W2053 16:00-16:15</p>	<p>A Lightweight Block Cipher Implementation in the Resource – Constrained Internet of Things</p> <p>Assist. Prof. Roman Alex Lustru, Ariel Sison, Jaydwin Labiano, Ruji Medina Technological Institute of the Philippines, Philippines</p> <p>The lightweight block ciphers are created for the resource-constrained Internet of Things (IoT). Hence, their implementations on software and/or hardware should augment the resource application. Thus, this study investigates the implementation of the modified Speck on two Arduino platforms to determine its performance on software and hardware separately. Through the analysis and comparison of experimental data results, it was found out that the ModSpeck has 0.25% higher statistical test compared to NIST standard accepted success rate and only 4% slower than its original cipher due to the employment of key derivation function in terms of software implementation. On its hardware performance tests, it uses only 50% more energy and consumes only 1.8% more memory as compared to selected lightweight algorithms. Its randomness exhibits good competitiveness in various aspects such as high throughput, low energy consumption and remarkable figure of merit.</p>
<p>W3002-A 16:15-16:30</p>	<p>Air-Channel Transistors with Coplanar Gates</p> <p>Prof. Wen Teng Chang, Po-Heng Pao National University of Kaohsiung, Taiwan</p> <p>High speed transistors rely on short carrier propagation times by reducing channel length and/or increasing carrier speed. The increase of electrical field is one of the approaches to increase the speed. However, this approach usually results in carrier scattering in solid state channels. Vacuum channel is an ideal medium to fabricate high speed transistors in contrast to solid-state channel because it renders carriers ballistic transport without carrier scattering. Instead of vacuum state, air channel with distance less than mean free</p>

	<p>path (~65 nm) can also exhibit ballistic transport and immunity from carrier scattering even in ambient environment. This study explored metal-based air-channel transistors with coplanar gates for different air-channel distances. The results indicate that the devices may exhibit field-enhanced feature but eventually field-lowered with the increase of gate potentials. An elevated positive potential on coplanar gates can attract a portion of the electrons, resulting in the decrease of collecting current although gate electric field enhances the current. For the device with the long distance of the emitter-to-collector, the gate field may enhance electron emission, resulting in the increase of tunneling current. However, the interference of the gate electric field can eventually lower the tunneling current. For the device with the short distance of the emitter-to-collector (about 35 nm in this study), the electrons can reach the collector without the participation of the gate field. The gate potential can distract electron emission and result in the decrease of the collecting current, even turning off the current. This result may be utilized in logic gate, such as inverter.</p>
<p>W1048 16:30-16:45</p>	<p>A CMOS Temperature Sensor with an Inaccuracy of 0.5°C from -20°C to 80°C</p> <p>Prof. Wenyuan Li, Lei Zhu, Peigen Yu Southeast University, China</p> <p>A smart temperature sensor is designed for very large scale integration (VLSI) systems to control power and temperature. PNP transistors are designed as sensing elements to generate temperature dependent output voltage. Three main techniques to enhance the accuracy are described as following: a chopped current gain independent bias circuit, dynamic element matching (DEM) and curvature compensation. To reduce area and power consumption, successive approximation register (SAR) ADC with split capacitor DAC structure is used, which achieves an effective number of bits (ENOB) of 10.4 bits after simulation. The sensor is designed in a TSMC 0.18μm 1P6M standard CMOS technology and consumes 700uA under a supply voltage of 1.8V. The proposed sensor is capable of working in the temperature range of -20 °C ~ 80 °C. With the one-point calibration, the sensor shows an inaccuracy of 0.5 °C.</p>

Session 7—Information Technology

Session Chair:

Venue: Salon VII | Time: 15:00-17:00

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<p>W1303 15:00-15:15</p>	<p>Target Detection Algorithms in Hyperspectral Imaging Based on Discriminant Analysis</p> <p>Prof. Edisanter Lo Susquehanna University, USA</p> <p>Target detection algorithm in hyperspectral imaging detects a certain material in a hyperspectral image using a known spectral signature of the material. Conventional algorithms for target detection assume that there is only one known target spectrum so target statistics cannot be estimated. Discriminant analysis is designed for classification, but this paper analyzes the performance of discriminant functions for target detection. The discriminant functions have been modified for target detection and uses simulated target spectra with different amount of random noise. Experimental results show that the algorithms can work well within a certain amount of noise.</p>
<p>W1078 15:15-15:30</p>	<p>Feature Fusion Based on Neural Image Captioning with Spatial Attention</p> <p>Ms. Qingqing Lu, Xiaomei Zhang, Xin Kang and Fuji Ren Nantong University, China</p> <p>Generating a natural language description of an image is a challenging but meaningful task. The task combines two significant artificial intelligent fields: computer vision and natural language processing. This task is valuable for many applications, such as searching images and assisting the people who have visually impaired to view the world, etc. Most approaches adopt an encoder-decoder framework, and some of the future methods are improved on the basis of this framework. In these methods, image features are extracted by VGG net or other networks, but the feature map will lose important information during the processing. In this paper, we fusing different kinds of image features extracted by the two networks: VGG19 and Resnet50, and put it into the neural network to train. We also add an attention into the a basic neural encoder-decoder model for generating natural sentence descriptions, at each time step, our model will attend to the image feature and pick up the most meaningful parts to generate captions. We test our model on the benchmark dataset called IAPR TC-12, comparing with other methods, we validate our model have state-of-the-art performance.</p>
<p>W2018 15:30-15:45</p>	<p>Stock Price Trend Forecasting Based on Differential Incremental Elman Network Model</p> <p>Huanbin Zou, Prof. Jie Zhu Shanghai Jiao Tong University, China</p> <p>The stock market is a complex nonlinear dynamic system. The stock price's trend has its inherent regularity and is also influenced by the market, the government and various non-economic factors. Therefore, there are nonlinearities and uncertainties in this complicated dynamic mechanism. The traditional quantitative forecasting method is based on mathematical statistics which cannot grasp the law of stock price fluctuation. The neural network theory developed in the past decades has gradually become a powerful tool for modeling and predicting nonlinear dynamic systems. It can</p>

	<p>automatically obtain effective features from stock historical data, and learn to build predictive models, which is very suitable for solving nonlinear time series problems in stock price' s forecasting. And this paper put forward a differential incremental model, which depends on historical stock sequence differential increment. The input of the network is derivatives, and the output is the increment. This model has a strong ability to track the trend of time series. The experiment proves that the differential incremental model has a better performance than conventional models, especially in the price fluctuant trend prediction.</p>
<p>W2029 15:45-16:00</p>	<p>The Effect of Internal Information Management on Firm Performance, through Supplier Partnership and Sustainable SCM</p> <p>Mr. Zeplin Jiwa Husada Tarigan, Sautma Ronni Basana, Hotlan Siagian Petra Christian University, Indonesia</p> <p>This study aims to examine the effect of internal information management on firm performance with the mediating role of supplier partnership and sustainable supply chain management (SSCM). The study used the population 87 manufacturing companies domiciled in East Java of Indonesia. One respondent represents each company from the management level such as supervisor or manager. Of 87, 57 companies have completed the questionnaires, and the response rate is 65.50%. Data collection used a questionnaire designed with a five-item Likert scale. Data analysis used the partial least square technique with Smart-PLS software version 3.0 to examine the hypotheses. The finding revealed that six hypotheses are supported and two additional finding. Internal information management affects supplier partnership, SSCM, and firm performance directly. Supplier partnership influences SSCM and firm performance. SSCM influence firm performance. Two additional finding: internal information management mediate the effect of internal information management on the firm performance, and SSCM mediates the influence of internal information management on the firm performance. This study paves the way for the manager in improving firm performance in the context of supply chain management. This paper also makes several contributions to enriching the theory on supply chain management.</p>
<p>W2071 16:00-16:15</p>	<p>A Method for an Intervention for Gender and Development Issues and Problems</p> <p>Mrs. Rolaida L. Sonza, Gilbert M. Tumibay Nueva Ecija University of Science and Technology, Angeles University Foundation-Graduate School, Philippines</p> <p>Gender and Development (GAD) seeks to achieve gender equality and transforms society's social, economic, and political structures. In State Universities and Colleges (SUCs), GAD programs and activities are conducted and annually monitored but lack of concrete data sources with particular data needed like the sex-disaggregated data. This paper presents a technology-based solution for GAD mainstreaming in SUCs. It is about the development of a new framework where data are analytically gathered, regularly updated and it also provides gender statistics and monitor the GAD projects. With the aid of web systems, GAD applications are integrated and highlighting relevant gender-related concerns and provide sex-disaggregated data for gender analysis and identifying the GAD interventions whether it is a project or other activities.</p>
<p>W1064 16:15-16:30</p>	<p>Location Context Ontology Model based on Ubiquitous Computing Environment</p> <p>Mr. Khamla Non Alinsavath, Lukito Edi Nugroho, Widyanwan and Kazuhiko Hamamoto Universitas Gadjah Mada, Yogyakarta, Indonesia./ Tokai University, Japan.</p> <p>Many technologies have been used to identify the structure of context-based information in location-based service for positioning performance. Ontology based modeling is one of techniques that offer a domain that classify the type of location context entities. In order to represent the knowledge information in term of localization approach based</p>

	<p>indoor and outdoor conditions. This research proposes a location context ontology modeling to assort different locations that are linked together with multi-level of both indoor and outdoor conditions. A model provides the detail of proposed location context model and context reasoning in ubiquitous computing environment to test how location ontology can function and at the same time, process the ability to infer more relations between location context entities.</p>
<p>W2065 16:30-16:45</p>	<p>Performance Analysis of the Modified Vigenere Algorithm to Secure Data</p> <p>Mr. Daniel Neri, Ariel Sison, Ruji Medina Technological Institute of the Philippines, Philippines</p> <p>The Vigenere algorithm is simple but considered unbreakable. However, the repeating key is its weakness and is still widely developed by researchers to increase the key length of the algorithm. This study aims to test and evaluate the security performance of the modified Vigenere cipher algorithm to address its vulnerability. The results show that the modified algorithm effectively overcomes Kasiski attack. Moreover, the frequency analysis test shows that the frequency of occurrence of alphabetic letters I and O obtained 9.0 curve value whereas M and V have 6.7 curve value. This frequency analysis result indicates that the enhanced Vigenere algorithm has reduced the effect of cryptanalysis. The modified algorithm has also passed the randomness ciphertext test when the frequency (monobit) test was performed. The result shows that the p-value computed is 0.841 which is higher than 0.01; hence, the generated ciphertext is considered random.</p>

Session 8—Pattern Recognition and Classification

Session Chair:

Venue: Salon VIII | Time: 15:00-17:00

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- *Session Photo will be taken at the end of the session.

W2014 15:00-15:15	<p>Speech Emotion Recognition using Convolution Neural Networks and Recurrent Neural Networks with Attention Model</p> <p>Ms. Xi He, Liyong Ren, Yongbin He University of Electronic Science and Technology of China, China</p> <p>Speech emotion recognition is an essential step in advanced human-computer speech interaction. Most of researchers focus on the entire speech sequence without handling emotionally-irrelevant speech frames specifically. In this study, a novel deep recognition framework is proposed, which using attention mechanism to focus on speech segments with salient emotion. The framework involves two stages. In the first stage, the unconstrained sparse auto-encoder is used to learn the convolution kernel, and the local salient features are extracted using convolutional neural networks(CNNs). In the second stage, the local salient features are aggregated into a high-level representation using bidirectional long short-term memory(BLSTM) with attention model. The experimental results on different language data sets show that the framework leads to higher accuracy and outperformed the conventional methods by about 12.32%.</p>
W2059 15:15-15:30	<p>Chinese Character Translator on Mobile Phone using Optical Character Recognition and Bing Translator API</p> <p>Assoc. Prof. Andreas Handojo, Anita Nathania Purbowo, Fenny Valentine Budiono Petra Christian University, Indonesia</p> <p>Chinese language is one of the international languages whose have users almost 35% of the world's population. Nonetheless the Chinese language has problems in learning how to write and how to read because it is in the form of characters or symbols so that it is more difficult to learn it. Chinese characters that used today is simplified Chinese character with approximately 3000 common characters that daily used. This character / symbol can also be written in Latin alphabet form called hanzi / hanyu pinyin. Some application developers such as Yellow Bridge, Google, Qhanzi, and Bing have provided translator applications from the Chinese characters to the Latin alphabet and vice versa. The application provided is generally still web-based and does not involve the ability to input the shape of a Chinese character in the form of an image, for example image input either from a file or directly from a camera input. This research try to build a Chinese character translator application using Tesseract Optical Character Recognition (OCR) Engine to retrieve the Chinese characters from the image, then translate it using a translator on the Bing API. This application will running on mobile phone. So the user could use image or mobile phone camera as an input. The test results show that the application can operate on various Android devices. OCR Engine has been able to perform the translation function with 74% success rate. The input image could have tolerance angle of approximately 15 degrees.</p>
W1058 15:30-15:45	<p>Traffic Sign Recognition Based on Up-sampling Convolution</p> <p>Mr. Yitian Lu, Ping Jiang, Shun Nishide, Xin Kang and Fuji Ren</p>

	<p>Nantong University, China</p> <p>This paper presented a method makes traffic sign recognition faster and more accurate. Traditional faster detectors are limited by their accuracy and are not sensitive to small objects, in the area of self-driving, it has some inconspicuous but important object of concern, such as traffic sign. We noticed that most traffic signs in dataset is small and easily to confuse with complex backgrounds. In this situation, after a series of convolutional layers, some of these traffic signs can't be detected or classified correctly, and the problem of neglect happens a lot. In order to settle this problem and optimize the result, we simplified the SSD structure and introduced an up-sampling structure to make the geometric details of small objects distinctly. This method significantly improved the result of recognition, we got 97.6% mAP on The German Traffic Sign Benchmark with 96×96 input and SSD300 has 79.7% mAP on same dataset.</p>
<p>W1059 15:45-16:00</p>	<p>Using CNN's gait recognition to strengthen laboratory safety supervision</p> <p>Mr. Yongjia Xu, Fuji Ren and Shun Nishide Tokushima University, Japan</p> <p>In addition to manual management, the security measures of important facilities such as school laboratories mainly rely on human body recognition systems. Gait recognition is non-intrusive, the identification process is fast and simple, and the recognition method is less affected by clothes, which makes it suitable for laboratory's safety monitoring purposes. This paper uses the form of gait energy image to extract the gait information features of the human body. The main contribution of the paper is the improvement of existing CNN models, adding a batch-normalization layer to for better recognition. Two types of experiments were conducted. The first experiment is a comparison with previous methods using the CASIA standard dataset. The second experiment is the evaluation with our new dataset using OpenCV to collect gait information in an actual laboratory environment. The results of the experiment show that the proposed method and its application in a real environment are feasible to enhance laboratory safety monitoring.</p>
<p>W1121 16:00-16:15</p>	<p>FSNet: Pose Estimation of endoscopic surgical tools using feature stacked network</p> <p>Dr. Yakui Chu, Xilin Yang, Yuan Ding, Danni Ai, Jingfan Fan, Xu Li, Yongtian Wang, Jian Yang Beijing Institute of Technology, China</p> <p>Identification of surgical instruments is important to understand surgical scenarios and provide assistant processing in endoscopic image-guided surgery. In this paper, we propose a novel feature stacked network (FSNet) for the recognition of surgical tools in endoscopic images. With a lateral connection and concatenation operation on the different layers of the feature pyramid network, high-level semantic information is fused to low-level features, and the bounding boxes are regressed for the tool instance proposals. Then, low-level semantic information is propagated to a high-level network through the bottom-up feature concatenating path. The keypoints of tools are detected in each proposed boundary box. Two state-of-the-art end-to-end tool keypoint recognition networks and three backbones are implemented for comparison. The AP and AR of the our FSNet based on ResNeXt101 are 46.1% and 36.5%, respectively, which surpass the results of other methods.</p>
<p>W1014 16:15-16:30</p>	<p>Superimposed Rule-Based Classification Algorithm (SRBCA) for One-Class Multivariate Conditional Anomaly Detection</p> <p>Ms. Ivy Kim D. Machica, Bobby D. Gerardo and Ruji S. Medina Technological Institute of the Philippines, Philippines</p> <p>Traditional anomaly detection causes a problem of detecting too numerous false positives in many problem domains. In this work, a Superimpose Rule-Based Classification algorithm (SRBCA) is proposed for conditional anomaly detection. The algorithm is an</p>

	<p>enhancement of the traditional OneR algorithm. The traditional OneR can generate a set of rules from its attributes with multiple classes, compute the error rate and apply the rule to the attribute with the smallest error. However, OneR has a disadvantage for one-class datasets which contains values belonging to the normal class. The enhanced algorithm, SRBCA, does not embody very complex rules similar to its predecessor. Furthermore, SRBCA includes the generation and application of rules from the one-class dataset in an n-dimensional space using classification. Holdout method was used to evaluate the performance of the classifiers' accuracy which involved training multiple subsets' behavioral and indicator attributes, superimposing rules and testing by using balanced and unbalanced class data to detect and label conditional anomaly data points. This paper shows the comparison between SRBCA, One-Class Support Vector Machine (OCSVM) and other anomaly detection classification algorithms for conditional anomaly detection. It proves that the new method can handle one-class multivariate for conditional anomaly detection with better accuracy.</p>
<p>W1060 16:30-16:45</p>	<p>Research on the Effect of Different Speech Segment Lengths on Speech Emotion Recognition Based on LSTM</p> <p>Mr. Zheng Liu, Fuji Ren and Xin Kang Tokushima University, Japan</p> <p>The emergence and development of deep learning makes speech emotion recognition more crucial. For the neural network sequence model, the amount of information contained in different lengths of speech segments has different effects on the sequence model. There is no reasonable explanation for how to separate the speech as input. In this work, we used the CASIA Chinese Emotional Corpus and divided it into 5 groups that every group has different lengths between 100-500ms. Using the features extracted by OpenSmile toolkit to calculate the standard deviation of each group, we found that the features of the same dimension have a very even distribution in the 200ms segments. We used the LSTM model with different features as input, and statistically analyzed the results, the results verified that 200ms is the most suitable input for the sequence model.</p>

Poster Presentation

Session Chair:

Venue: Salon IX | Time: 13:45-14:45

Note:

* The certification of Poster Presentations will be awarded after each presentation.

* For the Best Presentation of each session, it is encouraged to award to student author prior at the end of each session. Best presenter will be awarded at the dinner banquet.

*To show the respect to other authors, especially to encourage the student authors, we strongly suggest you attend the whole session, the scheduled time for presentations might be changed due to unexpected situations, please come as early as you could.

*Session Photo will be taken at the end of the session.

<p>W1004-A</p>	<p>HSPXY: A Hybrid-Correlation and Diversity-Distances Based Data Partition Method</p> <p>Dr. Hongzhi Li, Wenze Li, Lihong Hu Northeast Normal University, China</p> <p>A representative dataset is crucial to build a robust and generalized machine learning model, especially for small databases. Correlation is not usually considered in distance-based set partition methods, therefore, distant yet correlated samples might be incorrectly assigned. An improved sample subset partition method based on joint hybrid correlation and diversity x-y distances (HSPXY) is proposed in the framework of the sample set partition based on joint x-y distances (SPXY). Therein a hybrid distance consisting of both cosine angle distance and Euclidean distance in variable spaces, cooperates the correlation of samples in the distance-based set partition method. To compare with some existing partition methods, partial least squares (PLS) regression models are built on four set partition methods, random sampling (RS), Kennard-Stone (KS), SPXY and HSPXY. Upon the applications on small chemical databases, the proposed HSPXY algorithm based models achieved smaller root mean square errors and better coefficients of determination than other tested set partition methods, which indicates the training set is well represented. This suggests the proposed algorithm provides an alternative to obtain a representative calibration set.</p>
<p>W1005</p>	<p>Fault diagnosis of rolling bearings under variable load conditions based on multi-domain features and random forests</p> <p>Dr. Xiaoming Xue, Quanping Sun, Suqun Cao, Xuecheng Wang, Yanxia Zhuang Huaiyin Institute of Technology, China</p> <p>Vibration signals of rolling bearings collected under variable load conditions often have complex dynamic properties which pose a huge challenge for its effective fault diagnosis. To solve this problem, a novel fault diagnosis method based on multi-domain features and random forests is proposed in this paper. In features extraction, the fast ensemble empirical mode decomposition method is first used to decompose the original signals into a collection of intrinsic mode functions (IMFs). After signal decomposition, the singular values of the matrix formed by the row vectors of IMFs can be obtained by singular value decomposition. On the other hand, to obtain a comprehensive description about vibration signals, the statistical analysis method and Fourier transform are employed to extract 10 time domain features and 10 frequency domain features. As for the automatic diagnosis of bearing faults, a novel combined classifier algorithm named as random forests is used to classify the multi faults under different load conditions. Finally, the proposed method is evaluated by experiments with 10 fault types and some comparative studies are also given. The experimental results indicate its effectiveness and robustness for rolling bearing fault diagnosis under variable load conditions.</p>
<p>W1006</p>	<p>Numerical simulation of influence of boundary slip on lubrication performances considering cavitation of textured surface</p>

	<p>Yulong Sun, Bingbing Guo, Assoc. Prof. Quandai Wang, Xiaoli Hou, Pengyang Li and Yan Li Xi'an University of Technology, China</p> <p>A finite element calculation model of friction pairs with different micro texture features was established. Considering the condition of surface texture cavitation, numerical calculation was carried out by computational fluid dynamics (CFD) software to study the influence of the fluid-solid boundary slip on the lubrication performance of the friction pair under the hydrodynamic lubrication condition. The results demonstrate that the friction and bearing capacity of the lubricating film are reduced by the boundary slip, and the calculation results of the lubrication performance are influenced by the boundary condition of the cavitation caused by the micro texture; using the cavitation boundary condition, the boundary slip effect is enhanced and the theoretical comprehensive lubrication performance is improved; Compared with texture with cross section of triangle, rectangle and ellipse, the spherical texture facilitates carrying capacity improvement and there is the texture geometry size that facilitates lubrication property optimization.</p>
<p>W1018</p>	<p>Research on Plant Growth Environment Control System Based on BP Neural Network</p> <p>Mr. Meng Li, Ligu Tian, Chuang Liu, Hang Ding Tianjin University of Technology and Education, China</p> <p>As an advanced stage of modern facility agriculture development, plant factory is an efficient agricultural production system that realizes optimal plant growth by regulating plant growth environment. It mainly complies the automatic control of environmental factors such as temperature, humidity, illuminance and CO₂ concentration during plant growth. With the application of neural network in nonlinear and strong coupling control systems, this paper establishes a plant growth environment control system based on LabVIEW. Depend on this platform, we study and establish an environmental state model based on BP neural network, and achieve precise plant growth environment control. The experimental result proves that the system runs stably and reliably and meets the design requirements.</p>
<p>W1022</p>	<p>Convolutional and Long Short-term Memory Neural Network for Earthquake Detection</p> <p>Mr. Xuefan Xu, Yingxue Wang, Lian Zou, Yifeng Liu Wuhan University, China</p> <p>Earthquake detection is a foundation and critical work link in the study of seismology. Traditional detection algorithms have the disadvantages of low detection sensitivity, low computational efficiency, and poor general applicability. In this paper, we develop a novel earthquake detection method based on convolutional neural network (CNN) and long short-term memory network (LSTM). It extracts the high-level features in the seismic signal and learns the time-frequency characteristics of the main phase by recording the three component data on a single station. We train the network using 4932 waveform windows (2236 positive windows and 2696 negative windows) recorded in Wenchuan, China, with a window size of 30s. Using the trained model to test a continuous waveform for one day, compared to the long-short window energy ratio method (STA/LTA), all manually selected seismic events were successfully detected. To explore the impact of different window sizes and LSTM layers on the detection results, we use a larger dataset (derived from Oklahoma, USA) for network training. The test results show that our method not only has a good generalization ability for cataloging events, but also detects micro-seismic events that are not included in the catalog. The detection accuracy of cataloging events reaches 100%. Our results indicate that this method has fast, efficient and scalable superior performance in earthquake detection.</p>
<p>W1026</p>	<p>Particle Velocity Measurement of Pulverized Coal flow on a Power Plant Using Electrostatic Sensor Array</p>

	<p>Dr. Jingyu Zhang, Liguo Tian and Meng Li Tianjin University of Technology and Education, China</p> <p>The particle velocity of pulverized coal in pneumatic conveying pipelines is a key parameter directly related to a higher efficiency and reducing energy consumption of coal-fired power plant. The experiment was conducted on a coal-fired power plant. The cross-correlation velocities between different electrode pairs from electrostatic sensor arrays were presented in this paper. It was found that there was little difference in the particle velocity between the top and bottom areas, which indicated that the stratification flow in the pipeline was not obvious. However the distributions of particle velocities at left and right areas were not uniform. This was due to the influence of the downstream elbow. It can be confirmed that the particle velocities of pulverized coal at different positions in the pipeline are uneven, and a more detailed measurement method need be applied.</p>
W1029	<p>Design of Vineyard Ecological Environment Monitoring System Based on Wireless Sensor Network</p> <p>Ms. Zhenwei Song, Rongjin Yang, Meiyong Sun, Zhang Yi, Xiuhong Li, Qiao Song, Liu Lu and Yushuang Ma Beijing Normal University, China</p> <p>Grape growth is restricted by natural conditions such as soil, water and climate, At the same time, the artificial planting method of grape " buried in winter and dug out in spring " is pointed out to increase the concentration of particulate matter in the air. In order to meet the requirements of vineyard ecological environment monitoring, and solve these contradictions between the grape industry and environmental protection. This paper intends to design a vineyard ecological environment monitoring system based on wireless sensor network by using wireless sensor network technology. It monitors four influencing factors such as soil condition, meteorological condition, groundwater level and air quality. It realizes the real-time collection, transmission, display and storage of vineyard ecological environment data. The obtained data can provide support for the management and development of the vineyard industry.</p>
W1034	<p>Analysis and Calculation for Sound Transmission Loss of Aircraft Fuselage Interior Panel</p> <p>Mr. Han Feng, Xu Junwei, Feng Zixin Shanghai Aircraft Design and Research Institute of COMAC, China</p> <p>Combining acoustic theory of single wall and sandwich panel, the paper provided an analysis method to calculate sound transmission loss of typical aircraft fuselage interior panel. According to sound transmission loss equations, we defined the real parameters of interior panel and put them into calculation process, and then we got the result in flight and ground conditions. With comparing the data from calculation and measurement, we find that the value and trending could be marched well in special frequency range and there are drops at resonance, coincidence and dilatation frequencies of sandwich panel, and level of transmission loss is rising in flight condition.</p>
W1035-A	<p>The Comparison of Brain Functional MR Images for Aphasia with Picture- and Video-Based Treatment</p> <p>Ms. Kuan-I Tu, Chun-Han Yang, Kuo-Sheng Cheng National Cheng Kung University, Taiwan</p> <p>Introduction Approximately 18% of post stroke people will suffer from chronic aphasia. Naming deficit is one of the common symptoms in aphasia. Pictures naming is usually employed as the training material for current treatment. Nevertheless, videos with motions may be more real and suitable than pictures. Up to now, there is no comparison of treatment effects for these two training materials.</p> <p>Methods 9 patients with written inform consent are recruited for this study. The language behavior</p>

	<p>tests as well as fMRI images of brain before and after the naming training are acquired for analysis. After initial language tests, a known word and an unknown word are both selected to test each patient for comparison. During the fMRI images acquisition, the known and unknown words are represented in pictures and videos as the stimuli. After 12 weeks naming treatment, a new set of fMRI images for each patient is also acquired. In the pre-processing, the data would be slice-timing corrected, motion corrected, co-registered T1 weighted images and functional images, masked the regions of lesion individually, normalized to Montreal imaging institute (MNI) space, and smoothing. Afterwards, the non-parameter method, which is independent component analysis is applied to analyze the data. The brain images changes are also correlated with the outcomes of post language behavior tests.</p> <p>Results The fMRI results show that the video-based stimuli can recruit and activate more brain regions than the pictures stimuli. As practice time beyond more than two hours per week, the language behaviors of patients become better. The activated regions are correlated with successful training. From the fMRI images, there are similar activated regions for known and unknown word stimuli in video-based naming training. This may be the fact that patients have relearned the word.</p> <p>Conclusion From this study, we found that there are more activated brain regions in video-based stimuli than picture-based ones. Thus, it is believed that video-based naming training may benefit patients in word learning.</p>
<p>W1039</p>	<p>Structural Frequency Response Function Prediction and Experimental Validation between Aircraft Mount and Pylon</p> <p>Mr. Junwei Xu, Luyao Ge, Feng Han and Huayong Zhao Shanghai Aircraft Design and Research Institute, China</p> <p>Structure frequency response function (FRF) prediction and validation are necessary for aircraft noise and vibration engineering. With the frequency response functions (FRFs), the vibration transmission characteristic can be evaluated by engineer so that potential structure resonance behavior can be found at specific frequencies. In this paper, the concerned vibration frequencies come from the engine low pressure rotor and high pressure rotor during engine operation in cruise condition. The finite elements model of engine mount, pylon and pylon spar with fuselage was established and the frequency response functions between the engine mount excitation location and the pylon response locations were calculated. Then hammer method was used to acquire actual frequency response functions to validate the calculation results. The comparison results show that it was in good agreement between the calculated results and experimental results. From these frequency response functions, it could be evaluated that there was no resonant characteristics for the engine mount, pylon and pylon spar with fuselage structures at the concerned frequencies and there was no risk for the structure-borne noise problem caused by engines.</p>
<p>W1037-A</p>	<p>Weaning Time Prediction Using Respiratory Rate Variabilitybased Machine Learning</p> <p>Ms. Yen-Fen Ko, Po-Lan Su and Kuo-Sheng Cheng National Cheng Kung University, Taiwan</p> <p>Background: Extubation in time could prevent the risks of prolonged intubation, including progressive respiratory muscle weakness, risk of ventilator-associated pneumonia, and increased health-care expenditures. Spontaneous breathing trials (SBTs) is a common method to evaluate the weaning success. The results for short periods of reduced ventilator support may be used to simulate the increased work of breathing after extubation. Previous studies have shown both HRV and RRV, or in combination have been shown to be associated with the failed SBTs or extubation failure. However, the sensitivity and specificity did not increase significantly in comparison with traditional methods.</p> <p>Methods: 20 patients who recovered from acute respiratory distress syndrome are recruited in this study with written informed consent and IRB approval. During weaning trials, the</p>

	<p>physiologic signal are recorded, including ECG, arterial pressure, airway pressure, air flow, and regional ventilation distribution by electrical impedance tomography. The variability of respiratory rate is then calculated from electrical impedance tomography signals. RRV and HRV are used to train, validate, test and derive the predictive model by kernel support vector machines.</p> <p>Results RRV and HRV associated with weaning index are labeled by the internal medicine physician. A predictive model using RRV to improve extubation strategies is developed to further reduce both the duration of mechanical ventilation and extubation failure rate.</p> <p>Conclusions RRV is the discriminating feature for classification in weaning-trial patients. In the future, we need more high-quality weaning-trial data for optimal predictive performance and keep working on patient recruitment.</p>
W1041	<p>The Effects on Acoustic Characteristics of Aircraft with Constrained Layer Damping</p> <p>Mr. Zixin Feng, Feng Han, Junwei Xu Shanghai Aircraft Design and Research Institute of COMAC, China</p> <p>The constrained layer damping (CLD) could suppress vibration and sound radiation of thin-walled structure like aircraft fuselage. By calculating the sound transmission loss of panel with CLD based on finite element analysis method and sound pressure level of aircraft with CLD based on statistical energy analysis method, and compared with experimental results from standing wave tube and reverberation-anechoic chamber, the acoustic characteristics of aircraft and panel with CLD and the effect of CLD's parameters such as density and coverage have been investigated. The experimental and simulation results show good consistency and trend.</p>
W1036-A	<p>Mammography Feature Characterization Using Empirical Mode Decomposition</p> <p>Ms. Yi Chen Wu and Kuo Sheng Cheng National Cheng Kung University, Taiwan</p> <p>Objectives Breast cancer is the most common cancer among women. Recently, according to the statistics of public health in the Taiwan area, breast cancer has been the top of the ten cancers of leading-cause-of death. Mammography is the most often used methods for the screening and early diagnosis of breast cancer. Mammogram analysis may cause the extra loading of radiologists in routine clinical practice. The purpose of this study is to extract useful features from mammogram using the empirical mode decomposition (EMD).</p> <p>Methods This study collected several types of mammograms, including normal images with various densities and abnormal images with a variety of lesions. We pre-process image such as noise removal within MATLAB. Based on EMD and filtered back projection, we can get feature enhanced images with intrinsic mode functions (IMFs) which incorporate different physical substances. First, using the Radon transform to project the two-dimensional image into the one-dimensional signal in every angle. Next, get IMFs from the one-dimensional signal, then applying the inverse Radon transform to rebuild the two-dimensional IMFs. Final, adjusting the IMFs weight to produce an enhanced picture.</p> <p>Results The results show that in IMF1 and IMF2, microcalcification and calcification edges can be easily seen. The smaller calcification and larger calcification occur in IMF3 and IMF4, respectively. The spiculated margin and architectural distortion are visible in IMF2 and IMF3; both the benign and malignant tumors are in IMF5 and IMF6, and the symptoms can be clearly seen after the image is enhanced by adjusting the IMF weight.</p> <p>Conclusions In this study, the 2DEMD technique has been successfully applied to the characterization of breast lesion from mammograms. This is to enhance image features such as to help diagnosis of obscure lesions. Besides, it provides a helpful system for mammogram analysis.</p>
W1043	<p>Estimation of Aircraft Engine Mount Dynamic Forces based on Least-Squares Scheme</p>

	<p>Mr. Junwei Xu, Zixin Feng, Feng Han, Huayong Zhao and Chenxi Li Shanghai Aircraft Design and Research Institute, China</p> <p>In the engineering of noise and vibration, one of the most important things is to determine the dynamic forces caused by engine vibration at the excitation locations on the engine mount. With the determined dynamic forces, the structure dynamic behavior and aircraft cabin noise caused by engine vibration can be predicted and corresponding methods can be used to resolve possible problems. However, it is impossible to measure the dynamic forces at the engine mount caused by engine vibration directly when aircraft is in flight condition. In this paper, an indirect method called the least-squares scheme is implemented to back-calculate the engine mount dynamic forces with the measured frequency response function (FRF) matrices on the ground and measured structural acceleration in the flight condition. The norm condition number is applied to evaluate the inversion process and it shows that these identified dynamic forces on the engine mount meet the requirement of engineering.</p>
<p>W1072</p>	<p>Fully Convolutional Network with Intermediate Reservation for Insulator Segmentation</p> <p>Assoc. Prof. Zhen Qin, Qingya Chen, Jindou Xu, Weifu Peng, Tailong Chen, and Mei Ma University of Electronic Science and Technology of China, China</p> <p>Insulator state detection is a challenging problem for facilitating the process of inspecting in power transmission system. Nowadays, intense interest in applying convolution neural networks in image analysis is wide spread, its success is impeded by the limitation of the depth of the network and is also dependent on how to improve the information propagation and how to make full use of all the hierarchical features. To address these problems, this paper proposed a novel framework, called as the Fully Convolutional Network with Intermediate Reservation (FIR-Net), for insulator segmentation. In this framework, Intermediate Reservation has been adopted to solve the problem of gradients disappearance. The Intermediate Reservation reserves and fuses the intermediate loss of different layers, so as to improve the propagation of the network. Overall, this framework effectively propagates features both on the shallow layers and the deep layers, and increase the information diversity for insulator segmentation. By evaluating the proposed framework, it has achieved the good performance on the dataset provided by STATE GRID Corporation of China. This work is one of the early attempts of employing the idea of Intermediate Reservation on insulator segmentation.</p>
<p>W1073</p>	<p>An improved frequent pattern mining Algorithm based on TB-tree and tissue-like P system</p> <p>Linlin Jia, Xiyu Liu, Dr. Yuzhen Zhao and Jie Xue Shandong Normal University, China</p> <p>The purpose of frequent patterns mining is to find interesting items that appear together in a set of transactions, as an effective data mining technology, it has been widely used in many fields. Membrane computing is a new research direction of bio-inspired computing, which utilizes parallel and distributed computing models to solve problems effectively. In this paper, a new algorithm called ECTP, for mining frequent patterns, is proposed, which is based on TB-tree and evolution-communication tissue-like P system. The efficiency of the algorithm is improved by early pruning TB-tree by threshold and the parallelism of tissue-like P system. The result indicates that the algorithm is accurate and effective, gives some hints to use parallel operation principle mechanism in membrane computing systems.</p>
<p>W1091</p>	<p>Design of Robot Based on Internet of Things</p> <p>Dr. Xing Xiao, Zhang Yixin, Zhang Chong, Gu Jieming, Zhuo Zihan and Zou Xiaoxiang National Computer Network Emergency Response Technical Team/Coordination Center of China, China</p>

	<p>The mobile robot system based on the Internet of things is a combination of mobile phone terminal and mobile robot through the network server, and realizes the interaction of the data by using the Internet of things technology and the control system of the Android mobile terminal. The use of idle old Android mobile phone as the robot's brain, can use the mobile phone control terminal and computer control terminal through the P2P cloud connect platform remote control robot from the remote control terminal, by sending control signals, mobile phone terminal after receiving via Bluetooth single-chip microcomputer to control the robot, robot equipped with DHT11 temperature and humidity sensor MQ2 and gas sensor, real-time monitoring the indoor state and return control terminal interface, a robot can also watch the real-time camera image.</p>
W1061	<p>Cooperative Caching Technique for Multimedia Streaming Service in Mobile Ad-hoc Networks</p> <p>Backhyun Kim, Prof. Kyeongmo Park The Catholic University of Korea, Korea</p> <p>Mobile ad-hoc networks are a network consisting of only free-moving nodes. The node itself performs all tasks related to communication. This requires efficient communication techniques such as transmission path management, service and transmission quality management, and security. The caching technique reduces the number of transmission paths and thus enables efficient usage of node energy and transmission bandwidth. In MANET, nodes are more often selected to neighboring nodes than path nodes. The active caching technique that unconditionally stores the received data increases the load of the node as the request rate increases, resulting in a decrease in the available time of the node. In this paper, we propose a method to cache and provide the received content irrespective of whether the content is requested or not. The caching node is selected based on the number of hops from the server among nodes having a direct link with the transmission path. The simulation compares and analyzes the cache hit ratio in terms of the maximum movement speed of the node and the various content request rates. From the simulation results, the proposed technique can obtain a similar cache hit ratio using a relatively small number of caching nodes.</p>
W1128	<p>A control strategy algorithm for finite alternating transition systems</p> <p>Assoc. Prof. Jinjin Zhang and Yan Zhang Nanjing Audit University, China</p> <p>Recently, there has been an increasing interest in the formal analysis and design of control systems. In this area, in order to reduce the complexity and scale of control systems, finite abstractions of control systems are introduced and explored. Amongst, Pola and Tabuada construct finite alternating transition systems as approximate finite abstractions for control systems with disturbance inputs [SIAM Journal on Control and Optimization, Vol. 48, 2009, 719-733]. Given linear temporal logical formulas as specifications, this paper provides a control strategy algorithm to find control strategies of Pola and Tabuada's abstractions enforcing specifications.</p>
W1125	<p>Design of a First-order Annular Inverted Pendulum System</p> <p>Mrs. Zheng Fu, Rong Li Henan industrial technician college, China</p> <p>In this paper, a ring inverted pendulum system is designed. The rotating arm is driven by a motor to move back and forth. Drive the pendulum rod to do reciprocating motion perpendicular to the plane. By controlling the pendulum bar from the vertical state to the vertical state, the validity of the control algorithm is verified. Experiments show that the system can realize the stability control of inverted pendulum and is used to study the effectiveness of the algorithm.</p>
W1116	<p>Research on TSP Application Based on Improved Ant Colony Algorithm</p>

	<p>Assit Prof. Pan Zhao, Xiaoqin Ma and Xiaoling Yin Chizhou University, China</p> <p>In order to solve the shortcomings of traditional ant colony algorithm in solving traveling salesman problem (TSP), such as slow convergence speed and easy to fall into local optimum, an improved ant colony algorithm (IACO) is proposed. The algorithm uses k-nearest neighbor to influence the distribution of initial pheromones, applies roulette operator to urban transfer rules, and improves the pheromone updating strategy of ant colony to accelerate the convergence speed and improve the optimization ability of algorithm. Taking chn31 city problem as an example, the computer simulation results show that the improved algorithm is an optimization algorithm which can accelerate the convergence speed and improve the optimization ability, and is effective for solving TSP.</p>
W1009	<p>Research on Image Feature Recognition Based on Convolution-Long Short Term Memory Network</p> <p>Mr. Yu chao, Jing Zhou , Liang Gong, Lei Sun, Pengfei Shi , Xinxin Ou Jiangnan University, China</p> <p>In order to improve the image recognition rate of Long-Short-Memory-Network, using convolution calculation to reduce dimension and extract feature, which can remove large amounts of redundant information from image samples and accurately extract image features. The recognition rate of image can significantly improve by using classification of serialized image features obtained by compression and dimensionality as the input of LSTM. Firstly, CNN is used to extract the image features accurately. Secondly, the features are serialized into continuous picture bars with strong correlation. LSTM is used to classify the images, thus obtaining a better recognition effect. The experimental results show that the recognition rate of the CNN-LSTM is 30% higher than the basic LSTM, and the recognition rate of the CNN is 5% higher than the basic CNN.</p>
W1024	<p>A distributed fuzzy support vector machines model for real network traffic</p> <p>Mr. Jiang Jie, Qu Hua,Zhao Jihong, Zhang Yanpeng Xi'an Jiaotong University, China</p> <p>Traffic classification has been widely applied for networking. Previous works paid little attention to robustness and massive data of practice network traffic. In this paper, we propose a new strategy for the Random Fuzzy Support Vector Machines(RA-FSVM) based on fuzzy membership, as well as employ genetic algorithm to find optimal parameters. Moreover, we introduce the distributed idea to structure clusters, so as to speed up RA-FSVM model's computation. The results of simulation demonstrate the robustness and timeliness of RA-FSVM model.</p>
W1031	<p>A research on overseas investment decision of power grid project based on value orientation and risk prevention</p> <p>Haican Diao, Ms. Min Wang, Xinyu Lin Renmin University of China, China</p> <p>As grid projects invest overseas, they face complex internal and external environments. Based on the comprehensive analysis of the characteristics of overseas power grid projects, this study quantifies the overseas investment value and investment risk indicators. Based on the quantitative results, three value scenarios and four risk scenarios are determined based on different investment environments. Weigh the constraint relationship between overseas investment value and investment risk of power grid project, and based on the goal of value maximization, establish a collaborative optimization model of value and risk, use genetic algorithm to solve the model to determine the optimal investment scenario combination, and In a specific scenario, the national grid is selected to analyze the project investment in Brazil, and the decision model is further optimized to provide decision-making basis for the investment of the overseas grid projects of the State Grid.</p>

<p>W1040</p>	<p>Research on Crime Prediction Model Based on Random Forest</p> <p>Assoc. Prof. Rui Lu, Linying Li Liaoning Police College, China</p> <p>A crime prediction model based on the random forest is proposed to deeply explore the characteristics of criminal suspects to achieve the purpose of crime prevention. Firstly, the order of attribute importance is calculated according to the historical crime data, the attributes are reduced based on the attribute importance order. Then the obtained attribute set is used to train the random forest model to obtain the crime prediction model. The crime data was applied to the proposed model which is evaluated by the precision and recall. The experimental results show that the presented model is superior to the SVM and naive Bayesian method in the crime dataset with information noise and complex attributes.</p>
<p>W1054</p>	<p>Research of Ship Autopilot Rudder Based on Deep Belief Network</p> <p>Dr. Li Shaowei, Wang Shengzheng Jiangnan University, China</p> <p>In order to improve the control precision of the existing ship autopilot and improve the adaptive capability of the autopilot, an autopilot control algorithm based on the deep confidence network (DBN) is proposed. First of all, using the contrast divergence algorithm and the data recorded in the examination system of the Shanghai Maritime University, the constrained Boltzmann machines (RBMs) that make up each DBN are pre-trained in turn, and the results are used as the depth nerve Network weight of the initial value. On this basis, the back propagation algorithm is used to fine-tune the multi-layer depth structure. The simulation results show that the simulated sailing error between this method and the master captain is only 5.2%.</p>
<p>W1201</p>	<p>The Design of Two-Wheeled Robotic Self-Balancing Walking Control System</p> <p>Ms. Lingling Zhong, Teng Lv and Kang Liu Anhui Xinhua University, China</p> <p>Research on mobile robots has become a popular field in robot research because of the broad application prospects of mobile robots in all walks of life. Considering the complicated designs and high prices of the Humanoid robots' different DoF (Degree of Freedom), a two-wheeled robotic self-balancing walking control system is designed in the paper. The system uses the microcontroller as the control core, the attitude sensor to collect the angular velocity and acceleration data, and the Kalman filter to perform data fusion to obtain the optimal inclination and to realize the tilt control. It also uses the encoder to measure the walking speed to realize the speed control in the front and rear direction. The steering control of the robot is realized by the rotational difference between the two motors. The experiment proves that the two-wheeled robot can walk upright and keep balance, and has the advantages of simple structure, convenient parameter adjustment and low cost.</p>
<p>W1117</p>	<p>Simulation Study on Modeling and Operation Characteristics of Lubricating System of Marine Power Plant</p> <p>Mr. Caofengshou Xiong, He Ni, Yanqiao Chen, Jiashan Jin Naval University of Engineering, China</p> <p>In order to deeply study the operating characteristics of the lubricating oil system of marine power plant, the flow resistance, node pressure and auxiliary calculation modules are constructed based on the flow, pressure and heat transfer characteristics of the system components with the fluid network modular modeling method. Based on the analysis of the structural characteristics and working principle of a certain lubricating oil system of marine power plant, a dynamic simulation model of the lubricating oil system coupled with flow and heat transfer is established by means of the SimuWorks simulation platform. According to the actual test procedure, the main working parameters of the lubricating oil system in the</p>

	<p>typical dynamic process such as start-stop, switching and system changing conditions of the lubrication oil pump are calculated. which proves a strong basis for system control strategy optimization, and has certain engineering value.</p>
W1017	<p>How to Obtain the Missing Terms of Reduced-Round DES</p> <p>Assit. Prof. Lei Zhang, Zhaohui Liu, Weihua Hu, Juan Li and Lei Shi China Information Technology Security Evaluation Center, China</p> <p>In this paper, we obtain the missing IV terms of round function of DES, so that we can obtain the distinguishers of reduced-round DES. We apply the IV representation to reduced-round DES, so that the missing terms can be obtained. The missing IV terms can be exploited as the integral distinguishers because sum over any missing IV term is zero. This is the first time to construct integral distinguishers on reduced round DES.</p>
W3008	<p>An Equivalent Range Model Based on Time Resampling for High-Speed Maneuvering Platform SAR</p> <p>Ping Guo, Xiaoyang Jiao, Anyi Wang, Chunhui Lin Xi'an University of Science and Technology, China</p> <p>For the high-speed maneuvering platform SAR, the high-speed state will lead to stop-go assumption invalid and the forward acceleration would severely reduce the depth of focusing field in azimuth, thus the traditional range model with stop-go assumption will be ineffective. In this paper, the accurate range history is derived in a geometric configuration for high-speed maneuvering platform SAR and a new range equation is derived by transformation of bistatic to monostatic survey. Based on the new range equation, the azimuth time resampling is proposed by which one can obtain a simplified range equation with a form similar to that of the conventional SAR case. Then the typical imaging methods can be applied directly without any modification. Simulation results verify the effectiveness of the proposed method.</p>
W3009	<p>Design and Implementation of Real-time Video Processing and Transferring System Based on TMS320C6678</p> <p>Chen Hongzhou, Xu Tonglei, Chen Dongcheng Jiangsu Automation Research Institute, China</p> <p>In order to resolve the problem that processing and transferring video in real time, using the TI TMS320C6678 high-performance multi-core DSP and its high-speed SRIO and PCIE interfaces, a real-time video processing and transferring system is designed and realized. Firstly, the hardware design of a video processing board is designed. Introduce the video capturing, pre-processing and how to process video in real time. And then introduce the data processing, data transferring via SRIO between chips and data transferring between board and host computer via PCIe. Especially introduce the realizing step and key points. Lastly, experiments using the designed board are implemented. The result shows that the transfer delay between FPGA and DSP is less than 240ns, which can meet the real-time quality of video processing system. The designed board can process and transfer video in real time and robustly.</p>
W3020	<p>Small Intelligent Home System With Speech Recognition Based On ARM Processor</p> <p>Hua Jiang, Zihao Chen Nantong University, China</p> <p>The research is to design and implement the speaker independent speech recognition home system, and the final function achieves the recognition of isolated words. Through the module function integration, the speech recognition module LD3320 and the development board OK6410-A are connected. The results are processed, analyzed and judged after the speech module recognition results have been received by the ARM processor. Then the processor calls its own module function to indicate the recognition results. The program is</p>

	<p>implemented by C language in cross system compiler under Linux system. The downloading program is completed by the debugging function of the uboot. The opening and closing of the LED and the buzzer on the development board is completed by using 4 simple speech commands, including "kai deng", "la ba", "guan deng" and "fou jue". Then the intelligent home environment was simulated by 10 complex speech commands, including "wo shi", "chu fang", "ke ting", "dian shi" and so on. The results shows the small intelligent home system has been achieved.</p>
W1010	<p>Effects on the Successful Use of Mobile Phone Application for Healthcare</p> <p>Assoc. Prof. Waraporn Jirapanthong</p> <p>This research proposes the development of mobile application to promote Thai people' health. It consists of three main parts: firstly, to promote healthy consumption for individuals, secondly, to support appropriate work out for individuals, and thirdly, to support people to quit smoking. The group of 34 participants were not trained to use the application. It is found that some of them could have achieved the application's objectives. The results are analysed regarding participant demographics, for examples, age, gender, education background, and job background. Based on the results, it shows that the participants have positive attitude towards the use of mobile application. They agree that the application supports and motivates them to improve their health. Possible directions for further investigations can be elaborated.</p>
W2015	<p>Research on Discovery and Classification Technology of Electric Power Marketing Field Terminals</p> <p>Mr. Xianzhou Gao, Ruxia Yang, Wei Chen, Congcong Shi Global Energy Interconnection Research Institute, China</p> <p>In view of the characteristics of diversity, openness, complexity of Electric Power Marketing Field Terminals. There may be some security risks such as illegal terminal access. So the problem of discovery and classification of Electric Power Marketing Field Terminals is need to be solved, and then we can identify the types of illegal terminals in time and take corresponding measures. This paper aims at the diversity of Electric Power Marketing Field Terminals and their own differentiation characteristics, and proposes a technology without agent. Without installing client, it can automatically realize terminal discovery, and so solve the traditional problem of non-agent terminal discovery. At the same time, through K-means clustering algorithm terminal model identification, using unsupervised algorithm to extract and identify terminal type fingerprint information, it can achieve accurate classification of terminals, and provide timely alarm information and equipment data for network control and security protection.</p>
W2016	<p>Analysis of Illegal Terminal Bypass Blocking in Power Industry Marketing Scene Based on Network Topology and Result Estimation</p> <p>Ms. Ruxia Yang, Wei Chen, Xianzhou Gao, Congcong Shi Global Energy Interconnection Research Institute, China</p> <p>Because of the characteristics of wide-ranging points, diverse access modes and complex network topology in power industry marketing site, precise blocking must be achieved when abnormal terminals are blocked to ensure that blocking action only affects specific illegal access terminals. This requires precise selection of blocking points, and wrong selection of blocking points may have a significant impact on the normal business of the network. In order to solve this problem, this paper adopts the construction of the power industry marketing field terminal access network topology map, pre-calculates the blocking revenue and blocking cost of each blocking node in the attack graph, and then selects the blocking with the least benefit of the blocking cost. The node implements accurate and effective illegal terminal access path blocking by bypassing the access port, network redirection and other bypass blocking technologies. This method can achieve accurate control and precise blocking of illegal terminals, and is more suitable for the complex</p>

	environment of the power industry business hall.
W2017	<p>A Method of Fingerprint Legitimacy Discrimination Based on Fuzzy Matching Algorithms for Terminal Equipment</p> <p>Mr. Ziang Lu, Lu Chen, Mu Chen Ziang Lu Energy Interconnection Research Institute, China</p> <p>Nowadays, increasing number of network security events occur according to some illegal terminal counterfeiting intruding into the enterprise's internal network. The traditional terminal access system only uses some easy feature information (such as MAC address, IP address, host name, etc.) of the terminal equipment as the admission certificate to judge the legitimacy of terminals. In this paper, a method based on fuzzy approximate matching algorithm is proposed to identify the legitimacy of fingerprint features of terminal equipment. This method combines the basic characteristics of equipment and the behavior characteristics of equipment to generate device fingerprints, and uses the fuzzy approximate matching algorithm to compare the similarity between device fingerprints and fingerprints recorded in fingerprint database, so as to determine whether the device to be tested is a legitimate device. Finally, experiments show that the accuracy of the algorithm is 94.5%.</p>
W2023	<p>A Time-aware Multi-task Learning Model for Customer Value Prediction in Civil Aviation</p> <p>Mr. Haofei Yang, Youfang Lin, Zhihao Wu, Yiji Zhao Beijing Jiaotong University, China</p> <p>The precise prediction of customer value is essential for any successful dynamic customer relationship management (CRM) system. It is also the key for the company to maximizing customer returns. In this research, we concentrate on two main aspects of the work in civil aviation field. Firstly, a reasonable value model is the premise of this prediction issue. Therefore, we propose a parametric customer value model RFUM to estimate customer value in civil aviation. It evaluates customer value from four different attributes and then presents customer value by the weight of the attributes. Secondly, Time-aware Multi-task Value Prediction (TMVP) model is proposed to predict the future value of customer. It employs two supervisory signals of purchase propensity and customer value to better train a specific neural network to automatically learn features. Experiments demonstrate that the RFUM model can more accurately measure the value of customer in civil aviation market and the TMVP model can achieve a more precise regression prediction result. In addition, we also find that increasing the time of a single calculation window can improve the performance markedly.</p>
W2052	<p>Latent Factor-based Rating Feedback Learning for Restaurants Recommendation</p> <p>Ms. Yi Xu, Ziliang Wan, Zige Zhou, Yuchen Liu, Jinpeng Chen Beijing University of Posts and Telecommunications, China</p> <p>Nowadays, when people go out to eat, their choice of restaurant depends not only on taste, but also on many other factors. Therefore, mining what factors of the restaurant the users care about is a key problem for restaurant recommendation. This paper is engaged to mining the latent theme factors of restaurant the users care about and applying the result to restaurant recommendation. In this paper, we used LDA model to extract the latent theme features of the restaurants, calculated the similarity based on latent factors and rating feedbacks to make rating prediction and restaurants recommendation. This paper conducted an experiment with the review data from Yelp dataset, exploring the performance of the algorithm and the optimal theme number K. The results of the experiment showed that the algorithm achieved some improvement in rating prediction. To some content, applying the latent theme distribution to the problem of restaurant recommendation can solve the problem of data sparsity, decrease the computational dimension and raise the accuracy of rating prediction.</p>
W2055	Network Design for Express Package Delivery Service of Electric Vehicles

	<p>Ms. Xinxin Shi, Hong Ma Zhejiang University, China</p> <p>With people's enhancement of ecological consciousness, electric vehicles should be considered into network design for express package delivery service. This paper proposes a cycle-based model for this new problem and constructs an efficient heuristic algorithm to solve large-scale problem. The heuristic algorithm combines tabu search metaheuristic method and column generation based heuristic method. Intensification strategy plays a key role on finding high quality solutions. The algorithm performs well on small size instances compared with branch and price algorithm and it can handle large-scale network efficiently.</p>
W2063	<p>Research on the Privacy Security Puzzle Scheme of Blockchain</p> <p>Tao Feng, Mr. Wentao Hao, Jinze Du Lanzhou University of Technology, China</p> <p>The blockchain represented by Bitcoin, the distributed ledger system can prevent double spending effectively and other issues. But it has caused the concentration of bitcoin mining power, which completely contradicts the essential feature of the complete decentralization of the blockchain. In the blockchain system, transaction data information among users is transparently stored on the chain, and each participant can obtain a complete data backup. These transaction data are stored in an open and transparent manner on each node of the entire network, although it can prevent data forgery and tampering, it brings data privacy problems. In this paper, we propose a multi-level reward structure for the problem of centralized power calculation in the mining pool. This structure can make the miners work alone to prove the workload and obtain the reward through their own calculation power, in order to weaken the role of the mining pool. At the same time, for the data privacy security problem in the bitcoin trading system, we have improved the bitcoin puzzle, and proposed a puzzle scheme based on non-interactive zero-knowledge proof to ensure data transaction security.</p>
W2068	<p>Research on Real-time Behavior Recognition Method Based on Deep Learning</p> <p>Ms. Yuanjun Ding, Qingqing Yang, Haoyang Yu, Hongjie Wang, Xiaocong chen, Haibo Pu Sichuan Agricultural University, China</p> <p>With the advent of the era of big data, machine vision is growing rapidly and behavior recognition technology has a wide range of applications in our lives. As far as the current trend of behavior recognition technology is concerned, most of them have a series of problems such as slow calculation speed, low recognition accuracy and delay. In this paper, PoseNet deep neural network algorithm based on tensorflow.js is adopted to process the acquired image, train on the data set and extract the posture confidence and key point information of the human body. Through relevant algorithms, the behavior recognition of the target human body is completed, which has a broad application prospect in the future.</p>
W2078	<p>Solving the Problems for Optimum Thickness of Protective Clothing in a Way of Improvement Based Particle Swarm Optimization</p> <p>Mr. JinYang Zhang, LiuYang Xu and JiaQi Yang Wuhan University of Technology, China</p> <p>This paper is the answer thesis to the questions of the Chinese University Students' Mathematical Modeling Contest (A) in 2018. For the temperature distribution of high-temperature protective clothing, a one-dimensional thermal-conduction equation model established to obtain the numerical solution. And, a multi-objective optimization model is set up for various thicknesses of protective clothing in ideal evaluation method and the approximate optimal solution is obtained in collaborative optimization algorithm of multiple cities. Compared to the classic algorithm, the independently developed algorithm features stronger resistance to local convergence and is easier to obtain a better solution.</p>

<p>W2080</p>	<p>Enhancing Online Collaborative Filtering by Integrating Social Network</p> <p>Mr. Shaobin Lu; Guilin Li Xiamen University</p> <p>In recent years, researchers have done a lot of work to enhance online collaborative filtering (OCF) performance. Compared to most of the offline collaborative filtering (offline CF), the online collaborative filtering algorithm has three advantages: the low cost of retraining the model, dynamically tracing the user behavior habits and capturing the change of the item popularity. Many OCF algorithms extract user interests and item popularity features by updating algorithms model in time. But most of OCF ignore the similarity of users or items by updating all users' features or all items' features. In this study, we aim to integrate social network to improve the OCF performance. In order to achieve the goal, we propose two new methods by introducing user similarity which obtains from user social network to online collaborative filtering based on the Probabilistic Matrix Factorization (PMF) frame. One of the methods, which we called OCFUSim_I, is to calculate the similarity of users and find the neighbors of user, then adding the neighbors to the OCF. Another method, called OCFUSim_II, is to add similarity among users to OCF model. We conduct the experiments on three public datasets: MovieLens100K, MovieLens1M and HetRec2011 datasets. The experimental results show that our algorithms achieve better performance than several baseline approaches.</p>
<p>W1094</p>	<p>Integrate Information Inside Words to Improve Word Embeddings</p> <p>Mr. Chuanxiang Tang, Yun Tang University of Science and Technology of China, China</p> <p>we propose a method of improving word embeddings by fusing the hidden information within words, which is different from the traditional method of directly using morphological information on the surface of words to train word embeddings. Based on the averaging principle and two attention mechanisms, we propose to use the hidden information inside words, which is called the implied meanings of morphemes of words in this paper, and propose six implied meaning embedding models. The comparative experiments are carried out on two basic Natural Language Processing tasks, which prove that our models have more advantages than the classical models represented by CBOW, Skip-Gram and GloVe in mining semantic information. In addition, exploring the relationship between the importance of synthetic implied meanings and the word itself.</p>

Listeners

L-1	Assoc. Prof. Marian Minneli Santos Cruz Bulacan State University, Philippines
L-2	Mr. TAEYONG PARK Ulsan University College of Medicine, South Korea
L-3	Mr. SEUNGWOO KHANG Soongsil University, South Korea
L-4	Mr. KYOYEONG KOO Soongsil University, South Korea
L-5	Mr. HEERYEOL JEONG Soongsil University, South Korea

Author Index

One Day Tour in Hong Kong

Date: June 17, 2019

Place: Hong Kong

Time: 10:30 – 20:00

Route:

10:30	Wong Tai Sin Temple	30 minutes
11:20	Avenue of Stars	20 minutes
12:00	Lunch	1 Hour
13:00	Tsim Sha Tsui/Kowloon area	1 Hour
14:00	The Peak Hong Kong	20 minutes
15:00	Repulse Bay	20 minutes
16:10	Golden Bauhinia Square	20 minutes
17:00	Dinner	1 Hour
18:00	The Victoria Harbour, Night Cruise	45 minutes

Tips:

- + This visit will charge **100 USD** for each
- + Or you could choose to **enjoy free time on June 17 to explore Hong Kong by yourself**
- + Please be there on time, or you will miss the visit and will not get any refund of the payment.
- + The fees include: **traveling route, lunch, dinner and traveling bus service**
- + The itinerary /duration to visit may change without advance notice depending on group size or unexpected local situation

Service excludes:

- + Personal expenses (not mentioned above).

Should you have any more doubt, please contact us via wcse_general@zhconf.ac.cn



Must Visit Attractions in Hong Kong

Hong Kong is one of the two special administrative regions of the People's Republic of China. It is located on the north coast of the South sea, to the east of the Pearl River estuary, to the north of Shenzhen, Guangdong province, and to the west of Hong Kong is 63 kilometers from the neighboring Macao special administrative region. Known for its international environment, diverse culture and local cuisine, this modern region attracts millions of travelers every year. Below, we explore some of the best sights and attractions Hong Kong has to offer.

Wong Tai Sin Temple

The Sik Sik Yuen Wong Tai Sin Temple's claim to 'make every wish come true upon request' might have something to do with its popularity. Home to three religions (Taoism, Buddhism and Confucianism), its natural setting and beautifully ornamented buildings make it as much a scenic attraction as an important religious center.



Avenue of Stars

Thanks to the efforts of Hong Kong's movie industry over the past century, many in Asia and farther afield are familiar with the city's sights before they've even set foot here. The Avenue of Stars pays tribute to the names that helped make Hong Kong the 'Hollywood of the East'.



Tsim Sha Tsui/Kowloon area

Tsim Sha Tsui is located in the south of Kowloon Peninsula and faces Central across the sea. It is known as the one-stop shoppers' paradise brimming with both high-end malls and bustling shopping

streets. There are also various themed museums that inject a little cultural atmosphere to the area. After sunset, enjoying the brilliant night scenes along the Victoria Harbour can be a great way to end the evening.



The Peak Hong Kong

Standing at 552 metres above sea level, the Peak is the highest mountain on Hong Kong Island and a natural signaling post for incoming cargo ships in the nineteenth century. The more privileged early residents, however, found it the perfect retreat from Hong Kong's scorching summer heat.



Repulse Bay

This crescent-shaped stretch of sand is one of the most beautiful beaches in Hong Kong. Sun-drenched Repulse Bay has a relaxed resort-like feel to it. Its wide, wave-lapped beach is popular with both locals and visitors and is great for strolls in the early morning, daytime sun soaking when the bathers are out in force, or lingering at sunset when all has turned mellow.



Golden Bauhinia Square

The bauhinia is the emblem of Hong Kong. The Forever Blooming Bauhinia Sculpture that gives the Expo Promenade the commonly used name, Golden Bauhinia Square, was a gift from the Central Government to mark the 1997 Handover — an occasion that held tremendous significance for the world's largest nation and that stands out as a landmark event in 20th century history.



The Victoria Harbour

The energetic Victoria Harbour is truly Hong Kong's lifeline, and with its constant parade of vessels and breathtaking surrounding scenery, a harbour cruise is a must-do on any trip to Hong Kong. Step aboard for a journey into the true heart of Asia's world city.



The Influence of Information Integration on Hotel Performance through the Green Operation and Strategic Purchasing

Hotlan Siagian¹, Zeplin Jiwa Husada Tarigan², and Fransisca Andreani³

^{1,2,3} Petra Christian University, Surabaya, East Java, Indonesia

Abstract. Today, the tourism industry is one of the cores of the Indonesian economy. The growth of this industry has increased the number of a hotel located in the tourism place such as East Java of Indonesia. The rivalry among the hotel become unavoidable and even more intensified. On the other hand, the customer requirement has shifted to the environmental issue. Hence, the hotel's management has no choice other than to enhance the awareness of the management of environmental issues. This study examines the effect of information integration on hotel performance through strategic purchasing and the green operation. Data collection was performed by distributing 75 questionnaires representing 75 hotel. The respondents are the permanent employee involved in management levels such as supervisor or manager. The result suggested as follow: 1) The information integration affects the hotel performance, 2) The information integration influence the strategic purchasing, 3) The information integration affects the green operation, 4) The strategic purchasing influences the green operation, 5) The strategic purchasing affects the hotel performance, 6) The green operation affect hotel performance. The additional finding from this research can be drawn as follow: 1). Strategic purchasing mediates the effect of information integration on the hotel performance, 2). Green operation mediates the effect of information integration on hotel performance. The study provides an insight for the manager on how to enhance hotel performance from the point of SCM (Supply Chain Management).

Keywords: Strategic Purchasing, Green Operation, Information Integration, and Hotel Performance.

1. Introduction

The foreign tourists are people who visit a country outside their place of residence, which is driven by one or several needs without intending to earn income at the place visited. Domestic tourists also reported experiencing an increase from 58.07 million visitors in 2016 up to 58.67 million visitors in 2017 [1]. This growth of the visitor has naturally pushed the growth in the accommodation industry such as hotel, transportation, and culinary. The hotel provides service for the customer through the interaction between the provider and the customer. A report by the East Java Culture and Tourism Office indicated the number of 3-star, 4-star, and 5-star hotel amounted to 109 hotels in total. While in the year 2017, it increased to 117 hotels.

People are choosing the hotel for their need by considering several factors such as the location, price, and service quality and these factors become a competitive advantage of each hotel. Today, however, there has been increasing attention of the visitor to consider the environmental awareness of the hotel operation before deciding the choice. They prefer the hotel that operates in the way of environment-friendly. Environmentally friendly means that the hotel has paid attention to environmental sustainability in the hotel operation. Several operation aspects that reflect an environmental in a friendly way is the use of information technology, the application of green operation into daily practices and the implementation of strategic purchasing which procure material from the supplier which consider environmental sustainability. The green operation means that all employee has an orientation such as doing green purchasing, thinking about the environmental impact and pay attention to the safety and healthy work condition.

However, the question raised is how the issue of information technology, strategic purchasing, and green operation improve the performance of the hotel. There have been several studies in the literature reporting examine the extent to which the hotel performance is affected by the application of information technology

and the adoption of strategic purchasing and the green operation. Chen et al., [2] stated that information integration within an organization could support strategic purchasing because it can provide cost efficiency for hotels. Strategic purchasing must be supported by information integration so that the purchasing department gets detailed and complete information from the information system obtained by the purchasing department. Information integration can accommodate the overall operational needs of the hotel regarding material and supporting material requirements based on the requested by the users.

Today, hotels management have implemented an integrated information system which enables them to make changes quickly and precisely. Information technology in hotels can build a green operation because it can reduce paper use significantly, can reduce the use of hazardous materials and be able to use substances that are environmentally friendly substances [3]. Strategic purchasing built by the company can provide a green operation with strong partnerships with suppliers and long-term planning built. Hotel management should include the purchasing department in building a long-term hotel planning process to synchronize the primary and supporting material need through green purchasing practices. Green employees and green processes within the hotel need to be considered in depth to provide efficiency and effectiveness for the hotel. Green operations that have been carried out by the hotel should be able to contribute to improving hotel performance. The above description has shown that several studies have been performed to investigate the relationship of information integration, hotel performance, and strategic purchasing. So far, however, there has been little discussion about the effect of the green operation on the hotel performance and its relationship with information integration and strategic purchasing.

2. Theoretical Review

2.1. Hotel Performance

Organizational performance for hotels is defined as the achievement of the organization in a certain period. Hotels always try to maintain the performance achieved, to be able to compete with other hotels. The hotel is always trying to make certain improvements and developments to be able to increase the benefits of the hotel. The hotel performance is divided into two categories, namely financial performance, and non-financial performance. Financial performance is measured by liquidity ratios, solvency ratios, activity ratios, and profitability ratios. Non-financial performance can be seen from hotel occupancy, some hotel occupancy, hotel user satisfaction, hotel service quality and hotel brand image [4]. This research measure the performance of hotels in conducting operations or nonfinancial performance using five indicators namely 1) the timely checking-in process, 2) the increased responsiveness to customers demand, 3) decreased customer complaints rate, 4) the improved of service quality, 5) the quick check-out process time.

2.2. Information Integration

Information technology can provide information about the profile of the hotel resources and help employees carry out their work in the best performance. In the front-office of the hotel, information integration can be seen in the front some information such as the number of rooms filled, the number of rooms available, and the information that customers do through booking online systems [5]. Information integration is used in services and transactions with the customers in using the company's system. Hotels can use information integration to reduce operational costs associated with transaction costs resulting in increased company performance [6]. Similarly, the implementation of the information integration by the hotel also improve employee productivity and customer satisfaction [5]. Information technology in hotels can build a green operation because it can reduce paper use significantly, can reduce the use of hazardous materials and use environmentally friendly substances [3]. Hotels can reduce waste and use facilities and infrastructure that are friendly to the environment and use equipment repeatedly.

Another research by Chen et al., [2] stated that six integration within an organization could support strategic purchasing because it can provide cost efficiency. Strategic purchasing needs supported such as information integration in providing the purchasing department detailed and complete information about what material or service to purchase. Information integration can accommodate the overall operational needs of the hotel regarding material and supporting material requirements based on the requested by the users and approved by hotel management. Strategic purchasing focuses on cross-functional communication and the

relationship between the organization and the suppliers. On this study information integration defined as the extent to which the hotel has implemented the information integration and is assessed using four indicators: 1) data integration within the organization is running well, 2) reports are updated on time, 3) users can access on time, and 4) maintenance data can be done online. From the discussion three hypotheses:

H1: Information integration affects hotel performance.

H2: Information integration influence strategic purchasing

H3: Information integration affect the green operation

2.3. Strategic Purchasing

Purchasing is a process to obtain the goods and services needed by the organization. The selection of the strategy or technique for the company to procure material and supporting material on an ongoing basis is called a purchasing strategy. Strategic purchasing orientation always focuses on critical suppliers and suppliers who can collaborate in the long term [7]. The indicator used in strategic purchasing in this study was to see whether the purchasing department's strategies were in line with the strategic goal set by the hotel management. The indicator used is purchasing is 1) purchasing involve in the strategic planning process, 2) purchasing department understands well the strategic objective, 3) purchasing department is part of the management team, and 4) purchasing department develop a long-term procurement planning. Strategic purchasing has a better impact on the company's system of integration with suppliers and can be valid for an extended period. The purchasing strategy has an impact on the company's operational performance with the value chain between buyers and suppliers [8]. Green purchasing is a company business in carrying out purchasing activities are carried out in support of environmental sustainability goals such as the use of goods with minimum waste, recycling, reuse and replacement of hazardous and toxic materials [9]. Hence, strategic purchasing will support the implementation of the green operation. The hypotheses are proposed:

H4: Strategic purchasing influence the green operation.

H5: Strategic purchasing affect hotel performance

2.4. Green Operation

Green operation related to green purchasing is the purchase of materials that include reduction, reuse, and substitution of materials that are not environmentally friendly with environmentally friendly materials. The green operation system can also be used to monitor processes that are focused on environmental issues such as reduce paper, reduce the use of electricity, and use materials that can be recycled and reuse [10]. The green process is a production process or service that has minimal impact on the environment, occupational safety and health. Green processes always pay attention to internal conditions in the application of appropriate technology to achieve adequate process conditions in business value [11]. Green employee is an understanding of all members of the organization in thinking patterns, attitudes and actions that are environmentally friendly in carrying out activities and are always guided by occupational safety and health norms. Finally, green marketing is an activity about services provided to customers to provide customer satisfaction that does not have an impact on the environment. Dubey et al. [12] advised that manufacturing companies are needed to cooperate with raw material suppliers in producing environmentally friendly products. Because the company has the right as a customer of its suppliers, the organization has the authority to determine the criteria for environmentally friendly raw materials to be used. The indicator used to measure green operation is 1) the purchasing of the material focuses on green, 2) employees do work thinking about environmental, 3) employees do work paying attention, 4) the hotel focuses on green marketing, and 5) use technology information as an activity. Last revision, H6: Green operation influence the hotel performance

3. Research Method

The type of this research is an explanatory study which is used to carry out to examine the influence of one variable on other variables. The data collection was performed by using a questionnaire distributed to various hotels in the East Java region. The population of this study is all hotel registered in the East Java culture and tourism service covering three stars, four stars, and five stars with the total number is 265 hotels. The number of samples is determined to a minimum of 45 hotels (greater than ten times the number of

variables). Seventy-five questionnaires were distributed with the expectation that a minimum of 45 questionnaires obtained. The respondents are the permanent staff who have been in charge of the management such as supervisor and manager level as they are considered knowledgeable about the hotel operational process. The data analysis uses Partial Least Square (PLS) with Smart PLS version 3. The first analysis is to assess the measurement model (outer model) by evaluating the convergent and discriminant validity of each indicator and the reliability of the block indicators of each variable. The next step is to examine the structural model (inner model) through the assessment of the path coefficient together with its p-value or t-value. Table 1 lists the factor loading and cross loading of all indicators. Each indicator has a factor loading higher than the recommended minimum of 0.50 in all cases (range 0.653 to 0.873). Hence, all indicators are considered valid.

Table 1. Indicators factor loading and cross loading

Variable & Indicator	Factor Loading (bold) and Cross Loading				Validity
	X1	X2	X3.	Y1	
Information Integration (X1)					
1. Data integration running well (X1.1)	0.695	0.258	0.441	0.533	Valid
2. Reports are updated on time (X1.2)	0.725	0.062	0.490	0.418	Valid
3. The user can access data on time (X1.3)	0.825	0.270	0.493	0.518	Valid
4. Maintenance data can be done online (X1.4)	0.729	0.318	0.488	0.677	Valid
Strategic Purchasing (X2)					
Purchasing depart. involve in the strategic decision (X2.1)	0.066	0.653	0.391	0.276	Valid
Purchasing depart. understand the Org. objective (X2.2)	0.272	0.708	0.396	0.446	Valid
Purchasing depart. is part of the management team (X2.3)	0.346	0.842	0.235	0.464	Valid
Purchasing depart. develop long term procurement (X2.4)	0.230	0.786	0.314	0.382	Valid
Green Operation (X3)					
Purchasing material focuses on green purchasing (X3.1)	0.411	0.211	0.708	0.539	Valid
Employees think about environmental impacts (X3.2)	0.554	0.424	0.873	0.661	Valid
Employees pay attention to safety and healthy (X3.3)	0.52	0.383	0.778	0.613	Valid
The hotel front-office focuses on green marketing (X3.4)	0.498	0.326	0.734	0.518	Valid
Hotel Performance (Y1)					
The timely checking of check-in linking (Y1.1)	0.403	0.342	0.621	0.694	Valid
The response to hotel customers is increasing (Y1.2)	0.430	0.524	0.508	0.711	Valid
The level of service complaints is decreasing (Y1.3)	0.573	0.435	0.488	0.801	Valid
The quality of hotel services is increasing (Y1.4)	0.569	0.288	0.643	0.685	Valid
The reported linkage checks out is the right time (Y1.5)	0.650	0.335	0.445	0.695	Valid

Table 1 also lists the indicators cross loading which indicates that each indicator has cross loading value higher with its construct than with others. It shows that all indicators are valid in term discriminant validity. Table 2 lists the value of reliability of the measurement model as shown by Cronbach Alpha (C/A), composite reliability (CR), Rho Alpha, and the Average Variance Extracted (AVE). Those variables have a value higher than 0.70 for C/A, C/R, Rho Alpha in all cases (range 0.733 to 0.857). While the value of AVE exceeded the recommended minimum value of 0.50 in all cases (range 0.516 to 0.602).

Table 2. Reliability of Measurement Model

Variable	C/A	rho_A	C/R	AVE	R ²
Information Integration	0.733	0.737	0.832	0.555	-
Strategic Purchasing	0.739	0.750	0.836	0.563	0.102
Green Operational	0.777	0.791	0.857	0.602	0.475
Hotel Performance	0.764	0.765	0.842	0.516	0.720

Those results demonstrated that the measurement model has good validity and reliability in all cases. Table 2 also demonstrated the value of R square. Inner model assessment using PLS does not directly calculate the goodness of fitness. The primary method used to assess the inner model is by considering the variance explained called R square. The Greater value of R² indicates a higher variance of the construct explained by the independent variable. This value indicates the portion of the variance of the dependent variable explained by the independent variable.

4. Analysis and Result

The next analysis is to assess if the data support the hypotheses. The hypotheses are examined by assessing the t-value of each path coefficient which reflects the relationship of the construct.

Table 3. Path Coefficient and T-Statistic

Hypothesis	Original (O)	T Statistics	Remarks
Information Integration -> Strategic Purchasing (H1)	0.387	2.303	Supported
Information Integration -> Green Operational (H2)	0.558	4.775	Supported
Information Integration -> Hotel Performance (H3)	0.414	3.163	Supported
Strategic Purchasing -> Green Operational (H4)	0.320	2.070	Supported
Strategic Purchasing -> Hotel Performance (H5)	0.263	2.102	Supported
Green Operational -> Hotel Performance (H6)	0.231	2.615	Supported

Table 3 above shows the value of each path coefficient with its T statistic. For the significance level of 5% or *t-value* of 1.96, the results indicated that those path coefficients are positive with the T statistic value higher than 1.96 in all cases (range of 2.07 to 4.775). This result of analysis support and reinforce all the six hypotheses (H1 to H6). As all the hypotheses are supported, it also proves that strategic purchasing and the green operation mediate the relationship between information integration and hotel performance.

The primary goals of the present study are to investigate the effect of information integration on the hotel performance through the mediating role of strategic purchasing and the green operation. The results reinforce all the six proposed hypotheses. First hypotheses stated that information integration indeed affects the hotel performance. In the hotel management practice, this relationship is taking place mainly in the hospitality industry in the region of east java Indonesia. Information integration is reflected in the form of data integration across the department, on time data updating, data accessibility by the employee, and the maintenance of the data will improve the hotel performance. The main point in this finding is that data availability will enable proper and appropriate decision making in the sense of serving customer satisfaction and at the end improve the performance. Second hypotheses are also supported in this study. Information integration affects strategic purchasing [2]. The data integration across the department, on time data updating, data accessibility by the employee, and the maintenance of the data allow the purchasing department to establish an agreement with the supplier by hotel requirement and objective and develop an appropriate long-term procurement agreement.

Third hypotheses are stating that information integration influence the green operation is proved on this study. Information integration supports the organization to adopt the green operation into practice [3]. The use of information technology enables the operation of the hotel paperless. Elimination of the paper in the operation of the hotel is part of the green operation. The information integration also enables the hotel to communicate to the customer and the supplier without the use of the paper. The fourth hypotheses, which states that strategic purchasing affect the green operation is supported. The position of the strategic purchasing in the management team enable the purchasing department to select the supplier, which adopts environmentally friendly practices into their operational activity. Supplier holds an essential role in realizing the green operation and the strategic purchasing department should establish environmental awareness as one of the supplier criteria. The fifth hypotheses are stating that strategic purchasing influence hotel performance. It is clear, as the strategic purchasing focuses on the long-term agreement with the limited supplier, the company will benefit the cost efficiency from the material or service procurement, and at the end, improve the performance. This research supports the result of another research by Tarigan [13], which states the implementation of the innovation process enabling organizations to increase their operational performance.

The last hypotheses state that green operation affects hotel performance. Green operation adopts the paperless operation and replaced by the online information integration. Adopting the green operation enable the employee to practice environmentally friendly activity, and it is believed the customer will feel comfortable and enjoy the stay in the hotel. An exciting and notable finding from this study is the presence of the mediating role of the strategic purchasing and green operation in the relationship of the information integration on the hotel performance. Information integration affects hotel performance indirectly through

the green operation and strategic purchasing. When the hotel adopts the strategic purchasing and the green operation, the impact of information integration on the performance is greater due to the indirect influence.

5. Conclusion

The main finding can be summarized as follow: 1.the information integration affects the hotel performance, 2) the information integration influences the strategic purchasing, 3) the information integration affects the green operation, 4) the strategic purchasing influences the green operation, 5) the strategic purchasing affects the hotel performance, 6) the green operation affects the hotel performance. The additional finding from this research can be drawn as follow: 1). strategic purchasing mediates the effect of information integration on the hotel performance, 2), green operation mediates the effect of information integration on the hotel performance. This study provides an insight for the manager how to enhance the hotel performance from the point of view supply chain management. This study also makes several contributions to the current literature in supply chain management. This study focuses on the hospitality industry. Hence, it is recommended that further research is undertaken in the other area such as the manufacturing industry which use substantial hazardous material and often damaged environmental stability.

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