2018 Artificial Intelligence and Cloud Computing Conference

(AICCC 2018)

Dec 21-23, 2018,

Tokyo, Japan

HOTEL SUNROUTE PLAZA SHINJUKU

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Conference Venue

HOTEL SUNROUTE PLAZA SHINJUKU

Add: 2-3-1 Yoyogi, Shibuya-ku, 151-0053 Tokyo - Japan


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Table of Contents

Session 3

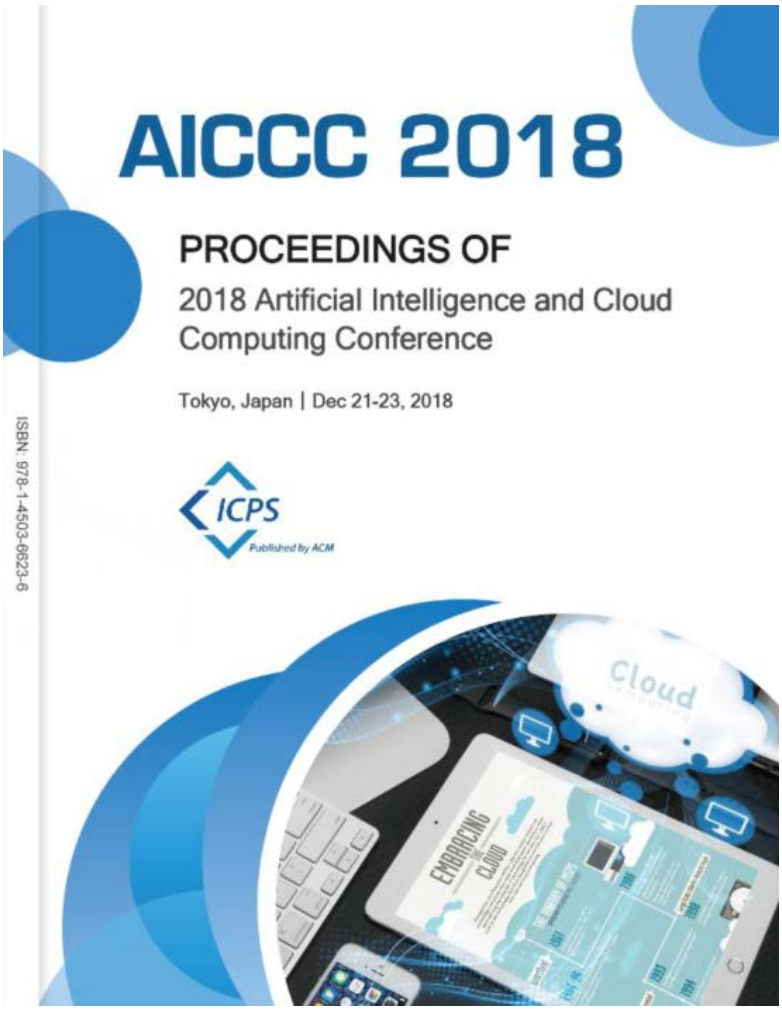
Session 4

Poster Session

Conference Introductions

Welcome to 2018 AICCC Tokyo conference. This conference is meant for researchers from academia, industries and research & development organizations all over the globe interested in the areas of Artificial Intelligence and Cloud Computing. It will put special emphasis on the participations of PhD students, Postdoctoral fellows and other young researchers from all over the world. It would be beneficial to bring together a group of experts from diverse fields to discuss recent progress and to share ideas on open questions. The conference will feature world-class keynote speakers in the main areas.

Papers will be published in the following proceeding:



International Conference Proceedings Series by ACM (ISBN: 978-1-4503-6623-6), which will be archived in the ACM Digital Library, and indexed by Ei Compendex, Scopus and submitted to be reviewed by Thomson Reuters Conference Proceedings Citation Index (ISI Web of Science).

Conference website and email：http://aiccc.net/and aiccc.contact@gmail.com

Presentation Instructions

Instructions for Oral Presentations

Devices Provided by the Conference Organizer:

Laptop Computer (MS Windows Operating System with MS PowerPoint and Adobe Acrobat Reader)
Digital Projectors and Screen
Laser Sticks

Materials Provided by the Presenters:

PowerPoint or PDF Files (Files should be copied to the Conference laptop at the beginning of each Session.)

Duration of each Presentation (Tentatively):

Regular Oral Presentation: about 15 Minutes of Presentation and 5 Minutes of Question and Answer

Instructions for Poster Presentation

Materials Provided by the Conference Organizer:

The place to put poster

Materials Provided by the Presenters:

Home-made Posters
Maximum poster size is A1
Load Capacity: Holds up to 0.5 kg

Best Presentation Award

One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on December 22th, 2018.

Dress code

Please wear formal clothes or national representative of clothing.

Keynote Speakers Introductions

Keynote Speaker I

Prof. Kaoru HIROTA
Tokyo Institute of Technology, Japan
Japan Society for the Promotion of Science Beijing Office, China
Beijing Institute of Technology, China

Dr. Hirota received Dr. E. degrees from Tokyo Institute of Technology in 1979. After his career at Sagami Institute of Technology (1979-1982), Hosei University (1982-1995), Tokyo Institute of Technology (1995-2015), he is currently a professor emeritus at Tokyo Institute of Technology, a director of Japan Society for the Promotion of Science Beijing Office, and a professor at Beijing Institute of Technology (in the framework of 1000 global experts program, Chinese government). His research interests include fuzzy systems, intelligent robotics, and image understanding. He experienced president of IFSA (International Fuzzy Systems Association), and president of SOFT (Japan Society for Fuzzy Theory and Systems.) He is currently life members of IEEE, Robotics Society of Japan, Information Processing Society of Japan, and Signal Processing Society of Japan, an honorary member of SOFT, a fellow of IFSA, a life fellow of ISME (Int. Society of Management Engineering), and a chief editor of J. of Advanced Computational Intelligence and Intelligent Informatics. Banki Donat Medal, Henri Coanda Medal, Grigore MOISIL Award, SOFT best paper award, Acoustical Society of Japan best paper award, honorary/adjunct professorships from “de La Salle University (Philippine), Changchun Univ. of Science & Technology (China), Harbin University of Science and Technology (China), the University of Nottingham (UK), Beijing Institute of Technology (China), and Chinese University of Geosciences Wuhan (China)”, and Honoris Causa from “Bulacan state university (Philippine), Budapest Technical University (Hungary), and Szechenyi Istvan University (Hungary)” were awarded to him. He organized more than 10 international conferences/symposiums as founding/general/program chairs. He has been publishing more than 300 journal papers, 55 books, and 550 conference papers.

【Topic：Toward the Realization of Multiagent Smart Society based on Computational Intelligence】

ABSTRACT: The presenters’ group has been studying on humans-robots interaction based on Computational Intelligence in the frame work of multiagent smart society, where a concept of Fuzzy Atmosfield (FA) is proposed to express the atmosphere in humans-robots communication. The FA is characterized by a 3D fuzzy cubic space with “friendly-hostile”, “lively-calm”, and “casual-formal” based on a cognitive science experiments and PCA. To understand easily such movement of the atmosphere, a graphical representation method is also proposed. To illustrate the FA and its visualization method, a demonstration scenario “enjoying home party by five eye robots and four humans” is introduced/demonstrated.

Keynote Speaker II

Prof. Seiichi Ozawa
Center for Mathematical and Data Sciences,
Kobe University, Japan

Seiichi Ozawa received the B.E. and M.E. degrees in instrumentation engineering from Kobe University in 1987 and 1989, respectively. In 1998, he received his Dr. Eng. in computer science from Kobe University. He is currently the deputy director of Center for Mathematical and Data Sciences and a full professor with the Department of Electrical and Electronic Engineering, Graduate School of Engineering, Kobe University, Japan. He was a visiting researcher at Arizona State University in 2005. His current research interests are neural networks, machine learning, online learning, pattern recognition, big data analytics especially in cybersecurity, SNS and smart agriculture. He published 141 journal and refereed conference papers, and 9 book chapters/monographs. He is currently an associate editor of IEEE Trans. on Cybernetics, Evolving Systems Journal, Pattern Analysis and Applications Journal, and he was an associated IEEE Trans. on Neural Networks and Learning Systems for 6 years. Currently, he is a Pro Tempore Vice-President for Public Relations of International Neural Network Society (INNS), a vice-president for finance of Asia Pacific Neural Network Society (APNNS), and a special board of governor of Japan Neural Network Society (JNNS). He is a member of Neural Networks TC, Data Mining and Big Data Analytics TC, and Smart World TC of IEEE CI Society. He is serving as a general chair of INNS Conference on Big Data and Deep Learning 2018, Program Committee Chair of International Conference on Neural Information Processing 2018, Workshop Chair of 2018 IEEE Smart World Congress, and Program Committee Members of IJCNN 2018, INNS 2018, EAIS 2018, etc.

【Topic：Challenges and Expectations against AI in Security】

ABSTRACT: Increasing the maliciousness and the diversity of cyber-attacks is one of the most concerned issues in recent years. There are various kinds of cyber-threads such as malware infection, DDoS attacks, probing to find security vulnerability, phishing, and spam mails to lure malicious web site, which intend to steal money/important information and to stop/disturb public services, etc. All these attacks are conducted via communication on the Internet, in which unstructured information is delivered or broadcasted in the form of packet data. Therefore, to utilize machine learning in detection, classification, and prediction of cyber-attacks, we need to consider how unstructured data streams should be formulated as structured data that are fit with machine learning schemes. Because such unstructured data often have no class label, no information on useful features, and no available training set in advance, which pose us big hurdles in applying machine learning methods. In many cases, solutions to the above issues are problem-dependent, but we can share some knowledge on how to tackle with such challenges in security. In addition, it has been pointed out that AI itself could be a target of cyberattacks where a limited extrapolation ability of deep neural networks could be used as vulnerabilities. I hope to share my experiences on the above topics with the audience.

Keynote Speaker III

Prof. Tetsuya Sakurai
Director of Center for Artificial Intelligence Research (C-AIR),
University of Tsukuba, Japan

Dr. Tetsuya Sakurai is a Professor of Department of Computer Science, and the Director of Center for Artificial Intelligence Research (C-AIR) at the University of Tsukuba. He is also the Chief Executive Officer of MathDesign, LLC. He received a Ph.D. in Computer Engineering from Nagoya University in 1992. His research interests are in the area of computational mathematics and numerical algorithms, specifically, he is interested in high performance algorithms for large-scale computer simulations, data analysis and machine learning.

【Topic：Simulation and Data Collaboration in the Digital Age】

ABSTRACT: In the past decade Society has undergone a Digital Shift, in which many economic fields have come to depend more and more on Digital Techniques, such as AI, Big Data, Simulation, Networking, etc. This has transformed not only the skills necessary from researchers and practitioners, but also how data is acquired, stored and shared. In Japan, the Japanese Government has responded with the "Society 5.0" plan, which is a set of strategies and priorities for industry, government and academia to help transition the Japanese society into the Digital Era. In our research group, we have developed many techniques for simulating complex phenomena efficiently using high performance numerical algorithms. More recently we have also researched a problem of how to share big data across different networked entities (such as hospitals in different countries), when this data has different standards and privacy requirements, using the concept of "Intermediate Data Layer Collaboration". In this talk, we introduce these ideas as well as what we see as the needs of the future digital society.

Keynote Speaker IV

Prof. Chiharu Ishii
Department of Mechanical Engineering,
Faculty of Science and Engineering, Hosei University, Japan

Chiharu Ishii received his PhD in Mechanical Engineering from Sophia University, Japan in 1997. He worked at Ashikaga Institute of Technology between 1997 and 2002, at Kogakuin University between 2002 and 2009, and at Shibaura Institute of Technology between 2009 and 2010. He has been working at Hosei University since 2010, and currently working as a Professor with the Department of Mechanical Engineering, Faculty of Science and Engineering at Hosei University. Dr. Chiharu Ishii has received several awards such as The Best Paper Award in the area of Tactile and Haptic Interfaces at the 4th International Conference on Human System Interaction (HSI 2011); Best Paper Award at the 1st International Conference on Computer Science, Electronics and Instrumentation (ICCSE 2012); Best Presentation Award at the International Conference on Intelligent Mechatronics and Automation (ICIMA 2013); Excellent Oral Presentation Award, at the 4th International Conference on Soft Computing & Machine Intelligence (ISCMI 2017). He is currently a member of IEEE, SICE, JSME, RSJ, IEEJ and JSCAS. His research interests are in medical robotics, assistive technology and robust control.

【Topic：New Trends on Medical and Assistive Devices in Aging Society】

ABSTRACT: Japan is facing a serious problem of population aging. The percentage of elderly people of age 65 years or over (aging ratio) is 27.3% in 2017, and it is forecasted that the aging ratio becomes 33.4% in 2035. In this way, Japan has reached a super-aged society which no country in the world has experienced. Becoming the super-aged society, it is necessary to respond to the demand of medical care and nursing of elderly people. Therefore, challenge for development of medical and assistive devices through an application of the Robot Technology (RT) has been promoted. In this talk, some medical and assistive devices developed in my laboratory are mentioned.

The robotic surgical system for single-port-surgery termed “HASROSS”, the lightweight power assist suit termed “Cool Vest” to reduce care giver’s burden in transfer work, the ultra-lightweight power assist suit termed "Aero back" to support worker who is working in half-sitting posture, control system of the electric wheelchair based on user’s biosignals such as EMG, EOG and EEG, and sensory feedback device for myoelectric prosthetic hand, are explained.

Keynote Speaker V

Prof. Maode Ma
Nanyang Technological University in Singapore

Dr. Maode Ma received his BE degree in computer engineering from Tsinghua University in 1982, ME degree in computer engineering from Tianjin University in 1991 and Ph.D. degree in computer science from Hong Kong University of Science and Technology in 1999.

Dr. Ma is a tenured Associate Professor in the School of Electrical and Electronic Engineering at Nanyang Technological University in Singapore. He has extensive research interests including wireless networking, wireless network security and optical networking, etc. He has been a member of the technical program committee for more than 110 international conferences. He has been a technical track chair, tutorial chair, publication chair, and session chair for more than 50 international conferences. Dr. Ma has published more than 130 international academic research papers on wireless networks and optical networks. He currently serves as an Associate Editor for IEEE Communications Letters, an Editor for IEEE Communications Surveys and Tutorials, and an Associate Editor for International Journal of Wireless Communications and Mobile Computing, Journal of Network and Computer Applications, Security and Communication Networks, International Journal of Vehicular Technology, Journal of Computer Systems, Networks, and Communications, and International Journal of Computing & Information Technology.

【Topic：Secured Enhancements for 6LoWPANs】

ABSTRACT: In order to promote the development of the IoT, the Internet Engineering Task Force (IETF) has been developing a standard named Internet Protocol version 6 (IPv6) over Low Power Wireless Personal Area Networks (6LoWPAN) to enable IP-based sensing devices to connect to the Internet. Besides, to support mobility management, a network-based localized mobility management (NETLMM) protocol named Proxy Mobile IPv6 (PMIPv6) is proposed. Although the 6LoWPAN standard has specified most of important issues in the design of a network, while the security and mobility issues have not been addressed. In this talk, I will address security issues, particularly on the issue of authentication in different scenarios, in 6LoWPAN networks. We present our solutions of the research work in series to protect the 6LoWPAN networks. The designed security schemes would not only protect the networks from different types of malicious attacks but also enable 6LoWPAN devices to efficiently and securely roam in the 6LoWPAN networks. The formal verification by various formal verification tools and the simulation by JAVA show that the proposed security schemes could efficiently enhance the security functionalities of 6LoWPANs to prevent various malicious attacks with less computational cost.

Schedule for Conference

Day 1	**December 21, 2018 (Friday)** 10:00~17:00 **Venue: Lobby (The first floor)** Participants Onsite Registration & Conference Materials Collection
Day 2	**December 22, 2018 (Saturday)** 8:55~18:10 Arrival Registration, Keynote Speech, Conference Presentation
	Morning Conference **Venue: Fuyo1/3 (The first floor)**
	Opening Remarks 8:55~9:00 Prof. Maode Ma Nanyang Technological University, Singapore
	Keynote Speech I 9:00~9:35 **Title: "Toward the Realization of Multiagent Smart Society based on Computational Intelligence"** Prof. Kaoru HIROTA, Tokyo Institute of Technology, Japan; Japan Society for the Promotion of Science Beijing Office, China
	Keynote Speech II 9:35~10:10 **Title: "Challenges and Expectations against AI in Security"** Prof. Seiichi Ozawa, Center for Mathematical and Data Sciences, Kobe University, Japan
	Coffee Break & Group Photo Taking 10:10~10:30
	Keynote Speech III 10:30~11:05 **Title: "Simulation and Data Collaboration in the Digital Age"** Prof. Tetsuya Sakurai, Director of Center for Artificial Intelligence Research (C-AIR), University of Tsukuba, Japan
	Keynote Speech IV 11:05~11:40 **Title: "New Trends on Medical and Assistive Devices in Aging Society"** Prof. Chiharu Ishii, Department of Mechanical Engineering, Faculty of Science and Engineering, Hosei University, Japan
	Keynote Speech V 11:40~12:15 **Title: "Secured Enhancements for 6LoWPANs"** Prof. Maode Ma, Nanyang Technological University, Singapore

<table>
<tr><td rowspan="5">Day 2</td><td colspan="2">Lunch 12:30~13:30
Venue: Fuyo1/3 (Meeting Room)</td></tr>
<tr><td colspan="2">Afternoon Conference
Venue: Minuet & Freesia (The second floor)</td></tr>
<tr><td>Session 1:13:45~15:15
Venue: Minuet
Topic: “Deep Learning and Machine Learning”
Session Chair: Prof. Seiichi Ozawa</td><td>Session 3: 13:45~15:15
Venue: Freesia
Topic: “Software Development and Security Assessment”
Session Chair: Prof. Maode Ma</td></tr>
<tr><td colspan="2">Coffee Break 15:15~15:35</td></tr>
<tr><td>Session 2: 15:35~18:00
Venue: Minuet
Topic: “Cloud Computing and Intelligent Computing”
Session Chair: Prof. Tetsuya Sakurai</td><td>Session 4: 15:35~17:50
Venue: Freesia
Topic: “Electronic Information Technology and Intelligent Systems”
Session Chair: Prof. Chiharu Ishii</td></tr>
<tr><td colspan="2">Poster 10:10~12:30 Venue: Executive Lounge
Session Chair: Prof. Kaoru HIROTA</td></tr>
<tr><td></td><td colspan="2">Dinner 18:15-19:30
Venue: Fuyo(2/3) (The first floor)</td></tr>
<tr><td>Day 3</td><td colspan="2">December 23th, 2018 (Sunday)
9:00~17:00
One Day Tour</td></tr>
</table>

Tips: Please arrive at the conference to upload or copy PPT into the laptop room 10 minutes before the session begins.

**** Please copy the report PPT to the meeting staffs on the registration day.**

If you must need use your own computer, please confirmed that the connecting line matches the computer before the start of your session .(Especially for the different types of Macbook)

Note:

(1) It is recommended to be familiar with all the meeting rooms in the registration day, including the room where you will make your oral presentation.

(2) The organizer doesn’t provide accommodation, and we suggest you make an early reservation.

(3) One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on December 22, 2018.

(4) One day tour does not include attractions tickets.

(5) We will take the group photo for all the attendees. Hope everyone can attend on time.



Oral Presentation Abstracts

Session 1

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 13:45~15:15

Venue: Minuet

Topic: "Deep learning and machine learning"

Session Chair: Prof. Seiichi Ozawa

AC3004 Presentation 1 (13:45~14:00)

Deep Learning for Named-Entity Linking with Transfer Learning for Legal Documents

Ahmed Elnaggar, Robin Otto, Florian Matthes
Software Engineering for Business Information Systems, Technische Universität München Garching bei München, Bavaria, Germany

Abstract— In the legal domain it is important to differentiate between words in general, and afterwards to link the occurrences of the same entities. The topic to solve these challenges is called Named-Entity Linking (NEL). Current supervised neural networks designed for NEL use publicly available datasets for training and testing. However, this paper focuses especially on the aspect of applying transfer learning approach using networks trained for NEL to legal documents. Experiments show consistent improvement in the legal datasets that were created from the European Union law in the scope of this research. Using transfer learning approach, we reached F1-score of 98.90% and 98.01% on the legal small and large test dataset.

Session 1

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 13:45~15:15

Venue: Minuet

Topic: "Deep learning and machine learning"

Session Chair: Prof. Seiichi Ozawa

AC3006 Presentation 2 (14:00~14:15)

Simple Computational Modeling for Early Abnormal Heartbeat Classification by using Decision Tree Approach

Mohamad Sabri Bin Sinal, Eiji Kamioka
Shibaura Institute of Technology, Tokyo, Japan

Abstract— Heart diseases contribute to the highest cause of death around the world particularly for middle aged and elderly people. There are various types of heart disease symptoms. One of the most common types is Arrhythmia which is considered as a dangerous heart condition since the symptom itself may initiate more chronic heart diseases and result in death if it is not treated earlier. However, the detection of Arrhythmia by humans is regarded as a challenging task because the natures of the symptom appear at random times. Therefore, an automatic detection method of abnormal heartbeat in ECG (electrocardiogram) data is needed to overcome the issue. In this paper, a novel multistage classification approach using K-Nearest Neighbor and decision tree of the 3 segments in the ECG cycle is proposed to detect Arrhythmia heartbeat from the early minute of ECG data. Specific attributes based on feature extraction in each heartbeat are used to classify the Normal Sinus Rhythm and Arrhythmia. The experimental result shows that the proposed multistage classification approach is able to detect the Arrhythmia heartbeat with 90.6% accuracy for the P and the Q peak segments, 91.1% accuracy for the Q, R and S peak segments and lastly, 97.7% accuracy for the S and the T peak segments, outperforming the other data mining techniques.

Session 1

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 13:45~15:15

Venue: Minuet

Topic: "Deep learning and machine learning"

Session Chair: Prof. Seiichi Ozawa

AC0018 Presentation 3 (14:15~14:30)

Cluster-Based Destination Prediction in Bike Sharing System

Pengcheng Dai, Changxiong Song, Huiping Lin, Pei Jia, Zhipeng Xu
School of Software and Microelectronics, Peking University, Beijing, China

Abstract— Destination prediction not only helps to understand users' behavior, but also provides basic information for destination-related customized service. This paper studies the destination prediction in the public bike sharing system, which is now blooming in many cities as an environment friendly short-distance transportation solution. Due to the large number of bike stations (e.g. more than 800 stations of Citi Bike in New York City), the accuracy and effectiveness of destination prediction becomes a problem, where clustering algorithm is often used to reduce the number of destination. However, grouping bike stations according to their location is not effective enough. The contribution of the paper lies in two aspects: 1) Proposes a compound station clustering (CSC) method that considers not only the geographic location but also the usage pattern; 2) Provide a framework that uses feature models and corresponding labels for machine learning algorithms to predict destination for on-going trips. Experiments are conducted on real-world data sets of Citi Bike in New York City through the year of 2017 and results show that our method outperforms baselines in accuracy.

Session 1

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 13:45~15:15

Venue: Minuet

Topic: "Deep learning and machine learning"

Session Chair: Prof. Seiichi Ozawa

AC3002 Presentation 4 (14:30~14:45)

Multi-Task Deep Learning for Legal Document Translation, Summarization and Multi-Label Classification

Ahmed Elnaggar, Christoph Gebendorfer, Ingo Glaser, Florian Matthes
Software Engineering for Business Information Systems, Technische Universität München Garching bei München, Bavaria, Germany

Abstract— The digitalization of the legal domain has been ongoing for a couple of years. In that process, the application of different machine learning (ML) techniques is crucial. Tasks such as the classification of legal documents or contract clauses as well as the translation of those are highly relevant. On the other side, digitized documents are barely accessible in this field, particularly in Germany. Today, deep learning (DL) is one of the hot topics with many publications and various applications. Sometimes it provides results out performing the human level. Hence this technique may be feasible for the legal domain as well. However, DL requires thousands of samples to provide decent results. A potential solution to this problem is multi-task DL to enable transfer learning. This approach may be able to overcome the data scarcity problem in the legal domain, specifically for the German language. We applied the state of the art multi-task model on three tasks: translation, summarization, and multi-label classification. The experiments were conducted on legal document corpora utilizing several task combinations as well as various model parameters. The goal was to find the optimal configuration for the tasks at hand within the legal domain. The multi-task DL approach out performed the state of the art results in all three tasks. This opens a new direction to integrate DL technology more efficiently in the legal domain.

Session 1

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 13:45~15:15

Venue: Minuet

Topic: "Deep learning and machine learning"

Session Chair: Prof. Seiichi Ozawa

AC3007 Presentation 5 (14:45~15:00)

Application of Deep Learning Method in Short-term Load Forecasting of Characteristic Enterprises

Yuchen Dou, Hang Zhang, Xinman Zhang, Zhihui Wu
Xi'an Jiaotong University, Xi'an, Shaanxi, China

Abstract— Short-term load forecasting is an important basic work for the normal operation and control of power systems. The results of power load forecasting have a great impact on dispatching operation of the power system and the production operation of the enterprise. Accurate load forecasting would help improve the safety and stability of power system and save the cost of enterprise. In order to extract the effective information contained in the data and improve the accuracy of short-term load forecasting, this paper proposes a long-short term memory neural network model (LSTM) with deep learning ability for short-term load forecasting combined with clustering algorithm. Deep learning is in line with the trend of big data and has a strong ability to learn and summarize large amounts of data. Through the research on the characteristics and influencing factors of the characteristic enterprises, the collected samples are clustered to establish similar day sets. This paper also studies the impact of different types of load data on prediction and the actual problem of input training sample selection. The LSTM prediction model is built with subdividing and clustering the input load sample set. Compared with other traditional methods, the results prove that LSTM proposed has higher accuracy and applicability.

Session 1

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Afternoon, December 22, 2018 (Saturday)

Time: 13:45~15:15

Venue: Minuet

Topic: "Deep learning and machine learning"

Session Chair: Prof. Seiichi Ozawa

AC3003 Presentation 6 (15:00~15:15)

Application of Deep Learning Method in Short-term Load Forecasting of Characteristic Enterprises

Ahmed Elnaggar, Bernhard Waltl, Ingo Glaser, Jörg Landthaler, Elena Scepankova, Florian Matthes
Software Engineering for Business Information Systems, Technische Universität München Garching bei München, Bavaria, Germany

Abstract— Deep learning methods are often difficult to apply in the legal do- main due to the large amount of labeled data required by deep learning methods. A recent new trend in the deep learning com- munity is the application of multi-task models that enable single deep neural networks to perform more than one task at the same time, for example classification and translation tasks. These powerful novel models are capable of transferring knowledge among different tasks or training sets and therefore could open up the legal domain for many deep learning applications. In this paper, we investigate the transfer learning capabilities of such a multi-task model on a classification task on the publicly available Kaggle toxic comment dataset for classifying illegal comments and we can report promising results.

Coffee Break	15:15-15:35

Session 2

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 15:35~18:00

Venue: Minuet

Topic: "Cloud computing and intelligent computing"

Session Chair: Prof. Tetsuya Sakurai

AC0030 Presentation 7 (15:35~15:50)

Detection of utility poles from noisy Point Cloud Data in Urban environments

Miguel Realpe, Alex Ferrin, Julio Larrea, Daniel Ochoa
Escuela Superior Politécnica del Litoral, ESPOL, FIEC, Ecuador

Abstract— In recent years 3D urban maps have become more common, thus providing complex point clouds that include diverse urban furniture such as pole-like objects. Utility poles detection in urban environment is of particular interest for electric utility companies in order to maintain an updated inventory for better planning and management. The present study develops an automatic method for the detection of utility poles from noisy point cloud data of Guayaquil - Ecuador, where many poles are located very close to buildings, which increases the difficulty of discriminating poles, walls, columns, fences and building corners. The proposed method applies a segmentation stage based on clustering with vertical voxels and a classification stage based on neural networks.

Session 2

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 15:35~18:00

Venue: Minuet

Topic: "Cloud computing and intelligent computing"

Session Chair: Prof. Tetsuya Sakurai

AC0048 Presentation 8 (15:50~16:05)

"Voices of Autism": Sentiment Analysis in Three Chinese Websites on Nonverbal Autistic Children

Aonan Guan, Jie Chen and Tiffany Tang
Wenzhou-Kean University, China

Abstract— Autism community is now receiving broad attention from Chinese society. Though data-mining on textual data have been widely used, its application on Chinese language environment on autism is rare. The previous research on textual mining of online posts did not target a specific symptom exhibited on children with autism; meanwhile, the written language is limited to English. In this paper, we conduct a comparison on text analysis of parents, reporters and experts' online posts and published work, particularly targeting nonverbal autistic children. The text analysis contains the word frequency analysis and sentiment analysis. Our study revealed that parents tend to share emotional views, reporters are likely to provide introductory articles for the autism, and experts hold more critical comments for nonverbal autistic children.

Session 2

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 15:35~18:00

Venue: Minuet

Topic: "Cloud computing and intelligent computing"

Session Chair: Prof. Tetsuya Sakurai

AC0019-A Presentation 9 (16:05~16:20)

Big Data and AI in Legal Research

Bart Custers
ELAW – Center for Law and Digital Technologies, Leiden University, The Netherlands

Abstract— Methods of data research are becoming increasingly important in the legal domain. This presentation focuses on the concept of legal big data, to show that law is an area in which a lot of big data is available. Several existing and potential applications of data research methods involving big data and AI for lawyers and legal researchers will be discussed and illustrated. Particular opportunities exist with regard to (1) predictions, (2) searching, structuring and selecting, and (3) decision-making and empirical legal research. These methods constitute an important contribution to legal practice and legal scholarship, providing novel unexpected insights and considerably increasing efficiency (less resources, more results) and effectiveness (more accurate and reliable results) of legal research. This may, among other things, result in improved legal services, new business models, new knowledge and a more solid basis for evidence-based policies and legislation. However, there are also several limits to and drawbacks of the use of these data research methods for law. From a methodological perspective, these include the lack of human intuition, an abundance of results that are not always relevant, limited insights in underlying causality, issues with repurposing, self-confirmation, self-fulfilling prophecies and reliability issues.

Session 2

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Afternoon, December 22, 2018 (Saturday)

Time: 15:35~18:00

Venue: Minuet

Topic: "Cloud computing and intelligent computing"

Session Chair: Prof. Tetsuya Sakurai

AC0053 Presentation 10 (16:20~16:35)

Systematic Literature Review of Risk Assessment for Big Data in Cloud Computing Environment: Security, Privacy and Trust

Hazirah Bee Yusof Ali, Lili Marziana Abdullah, Mira Kartiwi and Azlin Nordin
International Islamic University Malaysia, Malaysia

Abstract— The alarming rate of big data usage in the cloud makes data exposed easily. Cloud which consists of many servers linked to each other is used for data storage. Having owned by third parties, the security of the cloud needs to be looked at. Risks of storing data in cloud need to be checked further on the severity level. There should be a way to access the risks. Thus, the objective of this paper is to use SLR so that we can have extensive background of literatures on risk assessment for big data in cloud computing environment from the perspective of security, privacy and trust.

Session 2

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 15:35~18:00

Venue: Minuet

Topic: “Cloud computing and intelligent computing”

Session Chair: Prof. Tetsuya Sakurai

AC0049 Presentation 11 (16:35~16:50)

Microblog Mood Predicts the Box Office Performance

Xiaoyang Qiu, Tiffany Tang
Wenzhou-Kean University, China

Abstract— Zhan Lang 2 (Wolf Warrior 2), an action movie directed and acted by Wu Jing, won a huge success in the Chinese film market in 2017. Its earned 5.6 billion yuan in the box office, become the biggest film of all time in China. The discussion of the movie on social media plays an indispensable role in influencing the box office performance. This study aims to predict movie box office performance based on affective computation on the related feeds on social media. Since the research on Chinese sentiment analysis is limited, and the accuracy of the analysis is highly depending on the context, this study proposes to combine topic's hotness degree with emotion score to improve the accuracy of the prediction. Based on 16,496,675 related Sina Weibo feeds and Douban movie reviews in a restricted time zone, with the prediction algorithm proposed in the paper, the prediction result yields an R2=95.71%. Which means the success of Zhan Lang 2 is totally predictable.

Session 2

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Afternoon, December 22, 2018 (Saturday)

Time: 15:35~18:00

Venue: Minuet

Topic: "Cloud computing and intelligent computing"

Session Chair: Prof. Tetsuya Sakurai

AC0009 Presentation 12 (16:50~17:05)

Cloud Co-Residency Denial of Service Threat Detection Inspired by Artificial Immune System

Azuan Ahmad[1], Madihah Mohd Saudi[2], Wan Shafiuddin Zainuddin[3], Mohd Nazri Kama[4] and Norbik Bashah Idris[5]
1, 2, Universiti Sains Islam Malaysia, Malaysia;
3, CyberSecurity Malaysia, Malaysia; 4, Universiti Teknologi Malaysia, Malaysia;
5, International Islamic University, Malaysia;

Abstract— Cloud computing introduces concerns about data protection and intrusion detection mechanism. A review of the literature shows that there is still a lack of works on cloud IDS that focused on implementing real-time hybrid detections using Dendritic Cell algorithm (DCA) as a practical approach. In addition, there is also lack of specific threat detection built to detect intrusions targeting cloud computing environment where current implementations still using traditional open source or enterprise IDS to detect threats targeting cloud computing environment. Cloud implementations also introduce a new term, "co-residency" attack and lack of research focusing on detecting this type of attack. This research aims to provide a hybrid intrusion detection model for Cloud computing environment. For this purpose, a modified DCA is proposed in this research as the main detection algorithm in the new hybrid intrusion detection mechanism which works on Cloud CoResidency Threat Detection (CCTD) that combines anomaly and misuse detection mechanism. This research also proposed a method in detecting co-residency attacks. In this paper the co-residency attack detection model was proposed and tested until satisfactory results were obtained with the datasets. The experiment was conducted in a controlled environment and conducted using custom generated co-residency denial of service attacks for testing the capability of the proposed model in detecting novel co-residency attacks. The results show that the proposed model was able to detect most of the types of attacks that conducted during the experiment. From the experiment, the CCTD model has been shown to improve DCA previously used to solve similar problem.

Session 2

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Afternoon, December 22, 2018 (Saturday)

Time: 15:35~18:00

Venue: Minuet

Topic: "Cloud computing and intelligent computing"

Session Chair: Prof. Tetsuya Sakurai

AC0022 Presentation 13 (17:05~17:20)

Deep Feature Fusion over Multi-field Categorical Data for Rating Prediction

Yue Ding, Jie Liu and Dong Wang
Department of Computer Science and Engineering, Shanghai Jiao Tong University, China

Abstract— Many predictive tasks in recommender systems model from categorical variables. Different from continuous features extracted from images and videos, categorical data is discrete and of multi-field while their dependencies are little known, which brings the problem of heavy computation on a largescale sparse feature space. Deep learning methods have strong feature extraction capabilities and now have been more and more widely applied to recommender systems, but they do not perform well on discrete data. To tackle these two problems, in this paper we propose Deep Feature Fusion Model(DFFM) over sparse multi-field categorical data. DFFM utilizes categorical features as inputs and applies the Stacked Denoising AutoEncoder to obtain a dense representation. We construct a full feature connection layer and adopt a multi-layer convolution neural network to further extract deeper features and convert rating prediction to a classification problem. The extensive experiments on real world datasets show that our proposed method outperforms other state-of-the-art approaches.

Session 2

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Afternoon, December 22, 2018 (Saturday)

Time: 15:35~18:00

Venue: Minuet

Topic: "Cloud computing and intelligent computing"

Session Chair: Prof. Tetsuya Sakurai

AC0046 Presentation 14 (17:20~17:35)

Do We Need More Training Samples For Text Classification?

Wanwan Zheng, Mingzhe Jin
Doshisha University, Japan

Abstract— In recent years, with the rise of exceptional cloud computing technologies, machine learning approach in solving complex problems has been greatly accelerated. In the field of text classification, machine learning is a technology of providing computers the ability to learn and predict tasks without being explicitly labeled, and it is said that enough data are needed in order to let a machine to learn. However, more data tend to cause overfitting in machine learning algorithms, and there is no object criteria in deciding how many samples are required to achieve a desired level of performance. This article addresses this problem by using feature selection method. In our experiments, feature selection is proved to be able to decrease 66.67% at the largest of the required size of training dataset. Meanwhile, the kappa coefficient as a performance measure of classifiers could increase 11 points at the maximum. Furthermore, feature selection as a technology to remove irrelevant features was found be able to prevent overfitting to a great extent.

Session 2

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Afternoon, December 22, 2018 (Saturday)

Time: 15:35~18:00

Venue: Minuet

Topic: "Cloud computing and intelligent computing"

Session Chair: Prof. Tetsuya Sakurai

AC0029 Presentation 15 (17:35~17:50)

An Efficient Allocation of Cloud Computing Resources

Sultan Alshamrani,
University of Taif, Saudi Arabia

Abstract— The Cloud computing is a new paradigm for offering computing services via the Internet. Customers can lease infrastructure resources from cloud providers, such as CPU core, memory and disk storage, based on a "pay as you require" model. The approach in this paper is about distributing the resources (storage, processor, memory) of cloud providers to the customers by efficient manner, satisfying parties in terms of providing requirements and guarantee efficient and fair distribution of the resources. The approach system consists of two phases. In the first phase, we will create an interface in order to allow both customers and providers to insert their inputs. The system will allocate customers' demands based on the availability of the provider resources. In the second phase, the system will start to monitor the customers' usage of the resources to determine whether the customers using all the resources that have been allocated to them or did not. Then the system will reallocate the VMs resources that have not been used for a while to other customers. This will lead to reduce the cost and increase the provider profits.

Session 2

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Afternoon, December 22, 2018 (Saturday)

Time: 15:35~18:00

Venue: Minuet

Topic: "Cloud computing and intelligent computing"

Session Chair: Prof. Tetsuya Sakurai

AC0032 Presentation 16 (17:50~18:00)

English-Chinese Cross Language Word Embedding Similarity Calculation

Like Wang[1,2], Yuan Sun*[1,2] and Xiaobing Zhao[1,2]
1 School of Information Engineering, Minzu University of China, 100081 Beijing, China
2 Minority Languages Branch, National Language Resource and Monitoring Research Center, Minzu University of
China, 100081 Beijing, China

Abstract— Differences in languages among various countries, regions, and nationalities have created huge obstacles in communication. Cross-language word similarity (CLWS) calculation is the most practical way to solve this problem. Selection of corpus is one of the factors that influence the calculate result. Over the years, the study of semantic similarity has been dependent on monolingual corpus. Researches on cross-language word embeddings have relied on parallel corpus and bilingual dictionaries. Recent studies have shown that CLWS calculation reduces the need for bilingual corpus. This article compares the similarity in word embeddings of bilingual parallel and non-parallel corpus on traditional models and new MUSE (Multilingual Unsupervised and Supervised Embedding) models, and verifies that under the MUSE model, non-parallel corpus may have the same effect compares with the parallel corpus. Firstly, this paper uses the fastText method to calculate the monolingual word embeddings of Chinese and English corpus, and computes the semantic similarity between the two embeddings. Then it maps the word embeddings into an implicit shared space using MUSE model, comparing the effect of unsupervised and supervised machine learning methods in parallel and non-parallel corpus. Finally, the accuracy of the CLWS is calculated by matching the bilingual parallel dictionary. The experimental results prove that MUSE model could be better align monolingual word embeddings space, non-parallel corpus have the same effect compares with parallel corpus in calculating the CLWS, so that when dealing with bilingual languages that lack of parallel corpus, the non-parallel corpus can be used equally. This method could apply into minority language in the future.

Session 3

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 13:45~15:15

Venue: Freesia

Topic: "Software development and security assessment"

Session Chair: Prof. Maode Ma

AC0013 Presentation 17 (13:45~14:00)

A Fault Diagnosis and Maintenance Decision System for Production Line Based on Human-machine Multi-Information Fusion

Zhao-Hui Sun, Renjun Liu and Xinguo Ming
School of Mechanical Engineering, Shanghai Jiao Tong University, Shanghai, China

Abstract— In this paper, we describe the importance of the operation and maintenance in manufacturing systems for Manufacturing Enterprises. Through the mining of enterprise fault detection information by data mining method, we obtain the probability of machine failure. The importance of each machine in the manufacturing system is evaluated by the FUZZY FMEA method, and the importance information of the machine is obtained. Moreover, based on the D-S evidence theory, the contradictory and conflict information is merged in this paper, and a machine fault operation and maintenance decision-making system based on human-machine multi-information fusion is constructed. The feasibility of the decision-making system is verified by industrial case.

Session 3

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 13:45~15:15

Venue: Freesia

Topic: "Software development and security assessment"

Session Chair: Prof. Maode Ma

AC0031 Presentation 18 (14:00~14:15)

Natural Language Processing for Productivity Metrics for Software Development Profiling in Enterprise Applications

Christopher Chan[1], Steve Delaney[2] and Doug Schmidt[3]
1,2 Ryerson University, Canada; 3, Capital Blockchain, Canada

Abstract—In this paper, we utilize ontology-based information extraction for semantic analysis and terminology linking from a corpus of software requirement specification documents from 400 enterprise-level software development projects. The purpose for this ontology is to perform semi-supervised learning on enterprise-level specification documents towards an automated method of defining productivity metrics for software development profiling. Profiling an enterprise-level software development project in the context of productivity is necessary in order to objectively measure productivity of a software development project and to identify areas of improvement in software development when compared to similar software development profiles or benchmark of these profiles. We developed a seminovel methodology of applying NLP OBIE techniques towards determining software development productivity metrics, and evaluated this methodology on multiple practical enterprise-level software projects.

Session 3

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Afternoon, December 22, 2018 (Saturday)

Time: 13:45~15:15

Venue: Freesia

Topic: "Software development and security assessment"

Session Chair: Prof. Maode Ma

AC0045 Presentation 19 (14:15~14:30)

Feature Extraction Driven Modeling Attack Against Double Arbiter PUF and Its Evaluation

Susumu Matsumi, Yusuke Nozaki and Masaya Yoshikawa
Meijo University, Japan

Abstract—Many imitations of electronic components exist in the market. The PUF has attracted attention as countermeasures against these imitations. The 2-1 DAPUF is one of the PUFs which is suitable for FPGA implementation. However, it is reported that some PUFs are vulnerable to modeling attacks using feature extraction. Regarding the effectiveness of feature extraction, it has not been evaluated in the modeling attack against 2-1 DAPUF. This study evaluated the effectiveness of feature extraction by simulation and FPGA implementation. The results showed that the feature extraction was effective for modeling attacks against 2-1 DAPUF.

Session 3

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 13:45~15:15

Venue: Freesia

Topic: "Software development and security assessment"

Session Chair: Prof. Maode Ma

AC0047 Presentation 20 (14:30~14:45)

Evaluation of a Lightweight Cipher SPECK against Round Addition DFA

Yusuke Nozaki, Masaya Yoshikawa
Meijo University, Japan

Abstract—In the cloud computing and the internet of things (IoT), various devices are connected. Therefore, to enhance the security of IoT applications, lightweight ciphers, which can be implemented in small area, have attracted attention. SPECK is a typical lightweight cipher, which is proposed by the National Security Agency (NSA), is optimized for the software implementation of microcontrollers. Regarding hardware security, the risk of fault analysis, which can easily reveal the secret key of a cryptographic circuit, is pointed out. To improve the IoT security, the study of fault analysis for SPECK is very important. This study proposes a round addition differential fault analysis method for a lightweight cipher SPECK. The proposed method uses an only one pair of ciphertext, and can reveal two round keys of SPECK. The simulation result verifies the validity of the proposed method and indicates the vulnerability of SPECK.

Session 3

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Afternoon, December 22, 2018 (Saturday)

Time: 13:45~15:15

Venue: Freesia

Topic: "Software development and security assessment"

Session Chair: Prof. Maode Ma

AC0060 Presentation 21 (14:45~15:00)

AI based intelligent system on the EDISON platform

Jin Ma[1], Sung Chan Park[2], Jung Hun Shin[3], Nam Gyu Kim[4], Jerry H Seo[5], Jong Suk Ruth Lee[6] and Jeong Hwan Sa[7]
1,3,4,5,6,7 Korea Institute of Science and Technology Information(KISTI), South Korea
2, LSIS CO., LTD, South Korea

Abstract— In recent years, artificial intelligence (AI) has become a trend all over the world. This trend has led to the application and development of intelligent system that apply AI. In this paper, we describe a system architecture that uses AI, on a platform called EDISON, for computer science and engineering research. This architecture can be used to develop intelligent systems and can support applications in various fields by assisting in the development of algorithms and computer code. In this paper, we demonstrate the scalability of the proposed architecture on EDISON using different languages and application examples from various fields.

Session 3

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 13:45~15:15

Venue: Freesia

Topic: "Software development and security assessment"

Session Chair: Prof. Maode Ma

AC0042 Presentation 22 (15:00~15:15)

An Android Malware Detection Method Based on Deep AutoEncoder

Zhengping Jin[1], Nengqiang He[2], Tianqi Wang[3], Pingyang Chen[4], Hanbing Yan[5]
1,3, State Key Laboratory of Networking and Switching Technology, Beijing University of Posts and Telecommunications, Beijing, China
2,4,5 National Computer Network Emergency Response Technical Team/Coordination Center of China (CNCERT/CC), China

Abstract— With the emergence of various Android malwares, many detection algorithms based on machine learning have been proposed to minimize their threat. However, those still have many shortcomings for detecting the emerging Android malware, thus some deep learning algorithms have already been applied to Android malware detection, but to the best of our knowledge deep AutoEncoder has not yet. In this paper, an Android malware detection method based on deep AutoEncoder is proposed, where a specify AutoEncoder structure is designed to reduce the dimension of feature vectors which are extracted and converted from APK, and the logistic regression model is also applied to learn and classify the Android applications to be normal or not. The experimental results show the recall rate and F1 value of our proposal can respectively reach 0.93 and 0.643, which perform better than other three similar models.

Coffee Break	15:15-15:35

Session 4

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 15:35~17:50

Venue: Fressia

Topic: "Electronic Information Technology and Intelligent Systems"

Session Chair: Prof. Chiharu Ishii

AC3005 Presentation 23 (15:35~15:50)

Modelling Flight Delays in the Presence of Class Imbalance

Yong En Tan, Kai Sheng Teong, Mehlam Shabbir, Lee Kien Foo, **Sook-Ling Chua**
Multimedia University, Malaysia

Abstract— Flight delay is one of the common problems faced by many air passengers. Delays in flights not only bring about inconvenience to passengers, but also cost the airlines. To streamline travel experience, airlines have been leveraging on data analytics to predict flight delays. Although many prediction models have been proposed, they perform poorly especially on data that have imbalanced class distributions. Often, these models pay less attention to the minority 'delay' class, which are usually more relevant and important. In this paper, we address the issue of imbalanced class distributions to improve the overall classification performance in predicting flight delays. We validated our approach on a public airline on-time performance dataset.

Session 4

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 15:35~17:50

Venue: Fressia

Topic: "Electronic Information Technology and Intelligent Systems"

Session Chair: Prof. Chiharu Ishii

AC0010 Presentation 24 (15:50~16:05)

Image Classification for Vehicle Type Dataset Using State-of-the-art Convolutional Neural Network Architecture

Yian Seo, Kyung-Shik Shin
Ewha Womans University, South Korea

Abstract—Fast development in Deep Learning and its hybrid methodologies has led diverse applications in different domains. For image classification tasks in vehicle related fields, Convolutional Neural Network (CNN) is mostly chosen for recent usages. To train the CNN classifier, various vehicle image datasets are used, however, most of previous studies have learned features from datasets with a single form of images taken in the controlled condition such as surveillance camera vehicle image dataset from the same road, which results the classifier cannot guarantee the generalization of the model onto different forms of vehicle images. In addition, most of researches using CNN have used LeNet, GoogLeNet, or VGGNet for their main architecture. In this study, we perform vehicle type (convertible, coupe, crossover, sedan, SUV, truck, and van) classification and we use our own collected dataset with vehicle images taken in different angles and backgrounds to ensure the generalization and adaptability of proposed classifier. Moreover, we use the state-of-the-art CNN architecture, NASNet, which is a hybrid CNN architecture having Recurrent Neural Network structure trained by Reinforcement Learning to find optimal architecture. After 10 folded experiments, the average final test accuracy points 83%, and on the additional evaluation with random query images, the proposed model achieves accurate classification.

Session 4

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Afternoon, December 22, 2018 (Saturday)

Time: 15:35~17:50

Venue: Fressia

Topic: "Electronic Information Technology and Intelligent Systems"

Session Chair: Prof. Chiharu Ishii

AC0039 Presentation 25 (16:05~16:20)

SmartPeak: Peak Shaving and Ambient Analysis For Energy Efficiency in Electrical Smart Grid

Sourajit Behera, Rajiv Misra
Indian Institute of Technology Patna, India

Abstract— In modern times, buildings are heavily contributing to the overall energy consumption of the countries and in some countries they ac- count up to 45% of their total energy consumption. Hence a detailed understanding of the dynamics of energy consumption of buildings and mining the typical daily electricity consumption profiles of households in buildings can open up new avenues for smart energy consumption profiling. This can open up newer business opportuni- ties for all stakeholders in energy supply chain thereby supporting the energy management strategies in a smart grid environment and provide opportunities for improvement in building infrastructure with fault detection and diagnostics. In this context, we propose a approach to predict and re-engineer the hourly energy demand in a residential building. A data-driven system is proposed using ma- chine learning techniques like Multi Linear Regression and Support Vector Machine to predict electricity demand in a smart building along with a real-time strategy to enable the users to save energy by recommending optimal scheduling of the appliances at times of peak load demand, given the consumer's constraints.

Session 4

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 15:35~17:50

Venue: Fressia

Topic: "Electronic Information Technology and Intelligent Systems"

Session Chair: Prof. Chiharu Ishii

AC0051 Presentation 26 (16:20~16:35)

Smart Mirror Design Powered by Raspberry PI

Ahmad Sufril Azlan Mohamed[1], Siti Suhaily Surip[2], Mohd Nadhir Ab Wahab[3] and Darshan Babu L.Arasu[4]
1,3,4 School of Computer Sciences, Universiti Sains Malaysia, Malaysia
2 School of Arts, Universiti Sains Malaysia, Malaysia

Abstract— The smart mirror projects consisting of observable mirror, microcontroller, camera and PC monitor. Existing smart projects are limited with features available and only displaying information based on command receiving directly from the user. To make this mirror to be smarter, artificial intelligence are added in this project. Facial expression detection will be implemented so that smart mirror is able to interact with user and recognize changes of the facial muscle. By accordingly to their expression, smart mirror will make decision to display related information. Only recognized user can utilize this smart mirror via face recognition. At end of the project, a working smart mirror is expected and have ability to become one of these connected devices in our households.

Session 4

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 15:35~17:50

Venue: Fressia

Topic: "Electronic Information Technology and Intelligent Systems"

Session Chair: Prof. Chiharu Ishii

AC0017 Presentation 27 (16:35~16:50)

A Platform for Dynamic Optimal Nurse Scheduling Based on Integer Linear Programming along with Multiple Criteria Constraints

Te-Wei Ho, Jia-Sheng Yao, Yao-Ting Chang, Feipei Lai, Jui-Fen Lai, Sue-Min Chu, Wan-Chung Liao and Han-Mo Chiu
National Taiwan University, Taiwan

Abstract—Nurse rostering is a critical issue in hospitals around the world. With multiple constraints that must be considered to ensure job satisfaction, nurse scheduling usually poses a heavy financial burden on human resources with limited available staff resources. Managers also need to reproduce the roster of duties for the nursing staff. In addition, the staff allocation should be based on the visit number of patients. Hence, to address this issue, we implemented an automatic mechanism of nurse scheduling based on integer linear programing, along with multiple criteria constraints, which are suitable for real-world practice, and users can configure conditions for tasks and nurses as constraints in the integer linear programing. Finally, the platform could assign 36 staff members to 23 stations based on the proposed dynamic optimal algorithm following 20 stringent constraints in 0.5 second. Moreover, the specific manipulation shifts of scheduling on the platform is easy and can be automatically computed in minimum time. Compared with the manual scheduling, the proposed automatic mechanism could perform the scheduling task quickly and fairly. Most importantly, the platform is adequately reliable to decrease the burden for scheduling.

Session 4

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Afternoon, December 22, 2018 (Saturday)

Time: 15:35~17:50

Venue: Fressia

Topic: "Electronic Information Technology and Intelligent Systems"

Session Chair: Prof. Chiharu Ishii

AC0040-A Presentation 28 (16:50~17:05)

A probabilistic approach for learning mobility pattern in metropolitan areas

Hsin-Fu Lin, Shih-Hau Fang
Joint Research Center for AI Technology, Yuan Ze University, Taiwan

Abstract—In recent years, mobile big data analysis plays an important role for business advertisement, traffic controlling, and urban financial arrangement. The study predicts a user's trajectory with regression-based method and probabilistic based approach after the locations of a user distributed into points of interest. The probabilistic model performs most likelihood prediction from a user's past positions. The proposed method analyzes users' trajectories from about ten thousands of smart phones offered by a corporation. The experimental result shows mean distance errors between predicted and correct positions with regression-based prediction and probabilistic based model. The geographic map shows the floating crowd in a week. The further analysis shows the crowd behavior is located near Chiang Kai-Shek Memorial Hall, which is one of the most prosperous area in Taipei. The most influential street junctions in the area are identified by k-location method. It is quite useful for a company to determine where and when to deliver its advertisement. In the future, we will investigate the data fusion of the trajectory in the physical world and the digital footprints in the cyberspace.

Session 4

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 15:35~17:50

Venue: Fressia

Topic: “Electronic Information Technology and Intelligent Systems”

Session Chair: Prof. Chiharu Ishii

AC3008 Presentation 29 (17:05~17:20)

A data Lake architecture for monitoring and diagnosis system of power grid

Ying Li, AiMin Zhang, Xinman Zhang, Zhihui Wu
Xi'an Jiaotong University, Xi'an, ShaanXi, China

Abstract— In this paper, a data lake architecture is proposed for a class of monitoring and diagnostic systems applied to power grid. The differences between data lake and data warehouse is studied to make an informed decision on how to manage a huge amount of data. To adapt to the characteristics and performances of historical data and real-time data of power grid equipment, a monitoring and diagnosis system based on data lake storage architecture is designed. The application of the framework indicates the applicability and effectiveness of data lake architecture.

Session 4

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 15:35~17:50

Venue: Fressia

Topic: "Electronic Information Technology and Intelligent Systems"

Session Chair: Prof. Chiharu Ishii

AC0058 Presentation 30 (17:20~17:35)

Naïve Bayes Classifier for Indoor Positioning using Bluetooth Low Energy

Dzata Farahiyah, Rifky Mukti Romadhoni and Setyawan Wahyu Pratomo
Universitas Islam Indonesia, Indonesia

Abstract— Indoor localization becomes more popular along with the rapid growth of technology dan information system. The research has been conducted in many areas, especially in algorithm. Based on the need for knowledge of training data, Fingerprinting algorithm is categorized as the one that works with it. Training data is then computed with the machine learning approach, Naïve Bayes. Naïve Bayes is a simple and efficient classifier to estimate location. This study conducted an experiment with Naïve Bayes in order to classify unknown location of object based on the signal strength of Bluetooth low energy. It required 2 processes, collecting training data and evaluating test data. The result of the analysis with Naïve Bayes showed that the algorithm works well to estimate the right position of an object regarding its cluster.

Session 4

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, December 22, 2018 (Saturday)

Time: 15:35~17:50

Venue: Fressia

Topic: "Electronic Information Technology and Intelligent Systems"

Session Chair: Prof. Chiharu Ishii

AC0038 Presentation 31 (17:35~17:50)

An extinct EHW system for the evolutionary optimization and design of sequential circuit

Yanyun Tao[1], Yuzhen Zhang[2]
1, Soochow University, China; 2, The First Affiliated Hospital of Soochow University, China

Abstract— The main obstacles in the evolutionary design of sequential circuits are the state assignment and the large evolution time for a complete circuit. In this paper, in order to minimize evolution time, a genetic algorithm (GA) based on a cost evolution of the circuit evolution is proposed to evolve a state assignment, which can lead to complexity reduction. A cost evaluation of the circuit evolution is uniquely defined as the fitness function of state assignment candidates. Under the GA-evolved state assignment, a novel LUT-based circuit evolution (LCE) is proposed to improve the search for a complete circuit. An extrinsic EHW system namely GALCE, which combines GA and LCE, aims to the evolutionary optimization and design of sequential circuit. This system is tested extensively on eight sequential circuits. The simulation results demonstrate the proposed approach can perform better in terms of average evolution time reduction and success rate.

POSTER Presentation Abstracts

Poster 1

December 22, 2018 (Saturday)

Time: 10:10 ~ 12:30

Venue: Executive Lounge

Session Chair: Prof. Kaoru HIROTA

AC0002 Presentation (10:10~12:30)

A Hybrid Gomoku Deep Learning Artificial Intelligence

Peizhi Yan[1], Yi Feng[2]
1, Lakehead University, Canada 2, Algoma University, Canada

Abstract— Gomoku is an ancient board game. The traditional approach to solving the Gomoku is to apply tree search on a Gomoku game tree. Although the rules of Gomoku are straightforward, the game tree complexity is enormous. Unlike other board games such as chess and Shogun, the Gomoku board state is more intuitive. This feature is similar to another famous board game, the game of Go. The success of AlphaGo [5, 6] inspired us to apply a supervised learning method and deep neural network in solving the Gomoku game. We designed a deep convolutional neural network model to help the machine learn from the training data. In our experiment, we got 69% accuracy on the training data and 38% accuracy on the testing data. Finally, we combined the trained deep neural network model with a hard-coded convolution-based Gomoku evaluation function to form a hybrid Gomoku artificial intelligence (AI) which further improved performance.

Poster 2

December 22, 2018 (Saturday)

Time: 10:10 ~ 12:30

Venue: Executive Lounge

Session Chair: Prof. Kaoru HIROTA

AC0004-A Presentation (10:10~12:30)

Knowledge Embodiment in Healthcare Robots

L. G. Pee,
Nanyang Technological University, Singapore

Abstract— Knowledge embodiment refers to the transformation of knowledge into a form in which its value becomes evident. Knowledge embodiment in robotic systems with artificial intelligence (AI robotic systems) actualizes the value of knowledge much more powerfully than other entities, potentially displacing professionals. To understand the effects of knowledge embodiment in AI robotic systems on knowledge work, this study addresses the research question: How are knowledge and AI robots assembled for knowledge work? A case study of a large hospital that has employed different AI robotic systems in many parts of its healthcare service provision process indicates four forms of knowledge embodiment, namely, expediting, equipping, emancipation, and expansion. Further analysis suggests four ways embodiment affects knowledge work. This study contributes to research by highlighting that understanding AI technology's social and institutional connections with people is essential for realizing its value, and showing that AI robotic systems can go beyond being a tool used by humans to become a more autonomous actor at work. New research questions also emerge as knowledge embodiment changes the flow of information in organizations. For practice, this study highlights a design choice point for knowledge embodiment: matching the "body" (e.g., organismoid) to a robot's expected work role.

Poster 3

December 22, 2018 (Saturday)

Time: 10:10 ~ 12:30

Venue: Executive Lounge

Session Chair: Prof. Kaoru HIROTA

AC0012 Presentation (10:10~12:30)

An Orchestration Framework for a Global Multi-Cloud

Ming Lu[1], Lijuan Wang[2], Youyan Wang[3], Zhicheng Fan[4], Yatong Feng[5], Xiaodong Liu[6], Xiaofang Zhao[7]
1, University of Chinese Academy of Sciences, China;
2,3,4, Infrastructure as a Service, BT/IT, Lenovo, China;
5, University of Wisconsin-Madison, UK;
6, Institute of Computing Technology, Chinese Academy of Sciences, China

Abstract— Knowledge embodiment refers to the transformation of knowledge into a form in which its value becomes evident. Knowledge embodiment in robotic systems with artificial intelligence (AI robotic systems) actualizes the value of knowledge much more powerfully than other entities, potentially displacing professionals. To understand the effects of knowledge embodiment in AI robotic systems on knowledge work, this study addresses the research question: How are knowledge and AI robots assembled for knowledge work? A case study of a large hospital that has employed different AI robotic systems in many parts of its healthcare service provision process indicates four forms of knowledge embodiment, namely, expediting, equipping, emancipation, and expansion. Further analysis suggests four ways embodiment affects knowledge work. This study contributes to research by highlighting that understanding AI technology's social and institutional connections with people is essential for realizing its value, and showing that AI robotic systems can go beyond being a tool used by humans to become a more autonomous actor at work. New research questions also emerge as knowledge embodiment changes the flow of information in organizations. For practice, this study highlights a design choice point for knowledge embodiment: matching the "body" (e.g., organismoid) to a robot's expected work role.

Poster 4

December 22, 2018 (Saturday)

Time: 10:10 ~ 12:30

Venue: Executive Lounge

Session Chair: Prof. Kaoru HIROTA

AC0062-A Presentation (10:10~12:30)

A Study on Effective R&D Performance Analysis of Korea Using the Bayesian Network and AI

JaeHyuk Cho,
Korea Institute of S&T Evaluation and Planning, Korea

Abstract— In order to efficiently evaluate Korea's national R & D projects, diversity and specificity of R & D should be reflected. To this end, it is necessary to conduct studies that can improve the efficiency of business by objectively and quantitatively evaluating the core issues and capabilities of the project in preliminary feasibility studies and performance evaluation measurements. In this study, the results of the existing performance analysis index are analyzed closely and the key performance analysis factors that can reflect the diverse achievements of the previous research and development process are derived. Through this study, Bayesian network is used to identify the relative importance and priority among the key performance analysis factors, and the intelligent performance evaluation and analysis framework is applied using the AI algorithm to analyze the feasibility of the business. Respectively. It can contribute to the promotion of the national research and development project and objectivity.

Dinner Time	**18:15-19:30**

Listeners

Note:

• Session photo will be taken at the end of each session.

• The certificate for listeners can be collected at the registration counter.

• To show respect to other authors, especially to encourage the student authors, we strongly suggest you attend the whole session

 Listener 1 **Faisal Abbas** Amjad Enterprises, Pakistan	 Listener 2 **Jihoon Yang** Sogang University, Korea
 Listener 3 **Feybian Yip** Akamai Technology Ltd, China	 Listener 4 **Eunseok Kim** Incheon University, Korea
 Listener 5 **Chiyon Lee** Incheon University, Korea	 Listener 6 **Vincent Lai** The Chinese University of Hong Kong, Hong Kong
 Listener 7 **Sook-Ling Chua** Multimedia University, Malaysia	 Listener 8 **Sunshin Seo** Sogang University, Korea
 Listener 9 **Yan Wang** State University of New York; Binghamton University, USA	 Listener 10 **Dongjae Kim** Korea Advanced Institute of Science and Technology Republic of Korea

 **Listener 11** **Jeongln Baek** Korea Advanced Institute of Science and Technology Republic of Korea	 **Listener 12** **Seungho Lee** Korea Advanced Institute of Science and Technology Republic of Korea
 **Listener 13** **Jong Hyeon Park** Hanyang University, Korea	 **Listener 14** **Changyong Park** LG Electronics, Korea
 **Listener 15** **Danbi Lee** LG Electronics, Korea	 **Listener 16** **Daniel Cho** LG Electronics, Korea
 **Listener 17** **Saehun Jang** LG Electronics, Korea	 **Listener 18** **Lidong Li** Daimler China Incubator, China
 **Listener 19** **Hui Guan** Daimler China Incubator, China	 **Listener 20** **Oh-Soon Shin** Soongsil University, Korea
 **Listener 21** **Young-guk Ha** Konkuk University, Korea	 **Listener 22** **Gyuho Han** Inha University, South Korea

	Listener 23 Ui Nyoung Yoon Inha University, South Korea
	Listener 24 Sung Min Park Inha University, South Korea

One Day Visit

December 23, 2018 (Sunday) 9:00~17:00

(Tip: Please arrive at HOTEL SUNROUTE PLAZA SHINJUKU before 9 a.m. The following places are for references, and the final schedule should be adjusted to the actual notice.)
(Note that: If tickets are required for some views, and it's paid by the participants yourselves.)

1. **(9:00am) Assemble at HOTEL SUNROUTE PLAZA SHINJUKU**
2. **(9:00-12:00pm) Morning Visit**

Senso-ji Temple

The Sensoji Kannon temple is an ancient Buddhist temple located in Asakusa, Tokyo, Japan. It is Tokyo's oldest temple, and one of its most significant. Formerly associated with the Tendai sect of Buddhism, it became independent after World War II. Adjacent to the temple is a five-storey pagoda, Shinto shrine, the Asakusa Shrine, as well as many shops with traditional goods in the Nakamise-dori.
Throughout the year you can come across seasonal events held on the temple grounds. Some of the most popular include Asakusa-jinja Shrine's Sanja Festival collaboration event in May, the hozuki (Chinese lantern plant) market in July and the photogenic hagoita decorative paddle market in December.
The history of the temple in an interesting one. Legend says that long ago two fisherman on the Miyato River, the current Sumida River, caught a statue of Kannon —the merciful nirvana achiever— in their net. Despite trying to return the figure to the river multiple times it always came back to them, the leader of the region pointed out its Kannon; so it was enshrined. Although Sensoji Temple was founded in 628 the current crimson building is much more modern, as it was rebuilt after being destroyed in WW2.

Tokyo National Museum

The Tokyo National Museum collects, houses, and displays a comprehensive collection of art works and antiquities from Japan as well as other Asian countries. The museum also conducts research and investigations concerning its collection of books, rubbings, and photographs, related to fine art, and makes these items available to scholars.
The Independent Administrative Institution National Museum and the Independent Administrative Institution Research Institute of Cultural Properties were merged as of April 1, 2007 to create the Independent Administrative Institution National Institute for Cultural Property. National Institutes for Cultural Heritage was established in order to carry out preservation and utilization of cultural properties more efficiently and effectively.

Hamarikyu Gardens

Hama Rikyu (浜離宮, Hama Rikyū), is a large, attractive landscape garden in central Tokyo. Located alongside Tokyo Bay, Hama Rikyu features seawater ponds which change level with the tides, and a teahouse on an island where visitors can rest and enjoy the scenery. The traditionally styled garden stands in stark contrast to the skyscrapers of the adjacent Shiodome district.

3. (12:00-13:30) Lunch time

4. (13:30-17:00) Afternoon visit

Meiji Shrine

Meiji Jingu is a Shinto shrine. Shinto is called Japan's ancient original religion, and it is deeply rooted in the way of Japanese life. Shinto has no founder, no holy book, and not even the concept of religious conversion, but Shinto values for example harmony with nature and virtues such as "Magokoro (sincere heart)". In Shinto, some divinity is found as Kami (divine spirit), or it may be said that there is an unlimited number of Kami. You can see Kami in mythology, in nature, and in human beings. From ancient times, Japanese people have felt awe and gratitude towards such Kami and dedicated shrines to many of them. This shrine is dedicated to the divine souls of Emperor Meiji and his consort Empress Shoken (their tombs are in Kyoto).

Emperor Meiji passed away in 1912 and Empress Shoken in 1914. After their demise, people wished to commemorate their virtues and to venerate them forever. So they donated 100,000 trees from all over Japan and from overseas, and they worked voluntarily to create this forest. Thus, thanks to the sincere heart of the people, this shrine was established on November 1, 1920.

Tokyo Tower

Tokyo Tower is a communications and observation tower in the Shiba-koen district of Minato, Tokyo, Japan. At 332.9 metres (1,092ft), it is the second-tallest structure in Japan. The structure is an Eiffel Tower-inspired lattice tower that is painted white and international orange to comply with air safety regulations.

Built in 1958, the tower's main sources of income are tourism and antenna leasing. Over 150 million people have visited the tower. FootTown, a four-story building directly under the tower, houses museums, restaurants and shops. Departing from there, guests can visit two observation decks. The two-story Main Observatory is at 150 metres (490 ft), while the smaller Special Observatory reaches a height of 249.6 metres (819 ft).

5. (17:00) Dissolve in Tokyo Tower

Note

Note