KSS 2017

The 18th International Symposium on Knowledge and Systems Sciences

17-19 NOVEMBER 2017

Ramada Plaza Menam Riverside, Bangkok, Thailand

ABSTRACT BOOK

Abstract Book

The 18th International Symposium on
Knowledge and Systems Sciences
(KSS 2017)

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Contents

Welcome Message from Conference Committee of KSS 2017 ..... *1*

Organizing Committee *3*

Invited Speakers *7*

Conference Overall Schedule *15*

Detailed Schedule *17*

The Workshop on Artificial Intelligence and Internet of Things (AI2OT) Detailed Schedule *22*

Abstract *23*

Dynamics of Brand Acceptance Influenced by the Spread of Promotive Information in Social Media *24*

Complex Network's Competitive Growth Model of Degree-characteristic Inheritance *25*

Modeling of Interdependent Critical Infrastructures Network in Consideration of the Hierarchy *26*

Analysis on Influencing Factors on Cultivation of Graduate Innovation Ability Based on System Dynamics *27*

Duopoly Competition between Chauffeured Car and Taxi: An Analysis of Pricing and Market Segmentation *28*

Mobility Pattern of Taxi Passengers at Intra-urban Scale: Empirical Study of Three Cities *29*

Dynamics of the product space and nations'positions *30*

A Kind of Investor-Friendly Dual-Trigger Contingent Convertible Bond *31*

Forecasting the Duration of Network Public Opinions Caused by the failure of Public Policies: The Case of China *32*

Predicting Hashtag Popularity of Social Emergency by a Robust Feature Extraction Method *33*

Societal Risk and Stock Market Volatility in China: A causality analysis *34*

Research on Stock Price Forecasting Based on News Sentiment Analysis *35*

An Alternative Fuzzy Linguistic Approach for Determining Criteria Weights and Segmenting Consumers for New Product Development: A Case Study *36*

A Novel Two-sided Matching Method for Knowledge Transfer Based on Grey System *37*

A New Hybrid Linear-nonlinear Model based on Decomposition of Discrete Wavelet Transform for Time Series Forecasting 38

The Distribution Semantics of Extended Argumentation 39

Sequence-based Measure for Assessing Drug-Side Effect Causal Relation from Electronic Medical Records 40

MANDY: Towards A Smart Primary Care Chatbot Application 41

A Multi-Center Physiological Data Repository for SUDEP: Data Curation, Data Conversion and Workflow 42

Comparative Study of Using Word Co-occurrence to Extract Disease Symptoms from Web Documents 43

Emergency Attribute Significance Ranking Method Based on Information Gain 44

Mining Online Customer Reviews for Products Aspect-based Ranking 45

An Empirical Analysis of the Chronergy of the Impact of Web Search Volume on the Premiere Box Office 46

Conceptualizing Mining of Firm's Web Log Files 47

An Ontology-based Knowledge Framework for Software Testing 48

Concept Name Similarity Measure on SNOMED CT 49

Generating Storyline with Societal Risk from Tianya Club 50

Dynamic Control Model for Knowledge Transfer in Industry-university Cooperation 51

The Effect of Task Allocation Strategy on Knowledge Intensive Team Performance Based on Computational Experiment 52

Science and Technology Preview Based on Intelligent Convergence in Open Network Environment 53

Differential Game Model for knowledge flow in University-Industry collaborative innovation 54

A SAT View on Technological Capability Structure of China's Automobile Firm - The Case Study of GAC Group 55

The Workshop on Artificial Intelligence and Internet of Things (AI2OT)'s Abstract ***56***

A Comparative Annotator-agreement Analysis of Emotional Speech Corpora *57*

Hydroponic Farming Analysis in Greenhouse Environment using IoT Technology *58*

Similarity-based Mismatch Analysis between Objective Interestingness Measures in Association Rules Mining *59*

Virtual Reality Smulation for Health literacy Education *60*

Scale Invariant Feature for Thai Banknotes Recognition System *61*

Author Index ***62***

Venue ***64***

Welcome Message from Conference Committee of KSS 2017

The annual International Symposium on Knowledge and Systems Sciences aims to promote the exchange and interaction of knowledge across disciplines and borders to explore the new territories and new frontiers. With over 17 years of continuous endeavors, attempts to strictly define the knowledge science may be still ambitious, but a very tolerant, broad-based, and open-minded approach to the discipline can be taken. Knowledge science and systems science can complement and benefit each other methodologically.

The First International Symposium on Knowledge and Systems Sciences (KSS2000) was initiated and organized by Japan Advanced Institute of Science and Technology (JAIST) in September of 2000. Since then, KSS 2001 (Dalian), KSS 2002 (Shanghai), KSS 2003 (Guangzhou), KSS 2004 (JAIST), KSS 2005 (Vienna), KSS 2006 (Beijing), KSS 2007 (JAIST), KSS2008 (Guangzhou), KSS 2009 (Hong Kong), KSS 2010 (Xi'an), KSS 2011 (Hull), KSS 2012 (JAIST), KSS 2013 (Ningbo), KSS 2014 (Sapporo), KSS 2015 (Xi'an), and KSS 2016 (Kobe) have been held successfully, with contributions by many scientists and researchers from different countries. During the past 17 years, people interested in knowledge and systems sciences have become a community, and an international academic society has existed for 14 years. This year KSS is held in Bangkok, Thailand to provide opportunities for presenting interesting new research results, facilitating interdisciplinary discussions, and leading to knowledge transfer under the theme of "Artificial Intelligence and Information Systems for Knowledge, Technology and Service Management" during November 17-19, 2017. Four distinguished scholars deliver the keynote speeches which reflect those diverse features of KSS topics,

- Peter A. Gloor (MIT, USA), "From the Age of Emperors to the Age of Empathy"
- Yoshitsugu Hayashi (Chubu University, Japan), "Quality-of-Life (QOL) Based Urban Transport Planning Utilising ICT"
- Vilas Wuwongse (Mahidol University, Thailand), "An Evolution-Theoretical Approach to the Analysis of Social Systems"
- Minjie Zhang (University of Wollongong, Australia), "Multi-agent Solutions for Supply-Demand Management in Smart Grid Markets"

The organizers of KSS 2017 received 63 submissions, and finally 21 submissions were selected for the proceedings after a rigorous review process. The co-chairs of international Program Committee made the final decision for each submission based on the review reports from the referees, who came from Australia, China, France, Japan, New Zealand, Thailand, UK, and USA. Besides the main track of KISS 2017, we also include three special tracks; (1) 6 papers for KSS2017 Abstract Track, (2) 4 papers for JSSI Special Track for Journal of Systems Science and Information, and (3) 5 papers for the workshop on Artificial Intelligence and Internet of Things (AI2OT) for Journal of Intelligent Informatics and Service Innovation (JIIST).

The International Symposium on Knowledge and Systems Sciences (KSS2017): November 17-19, 2017. We received a lot of support and help from many people and organizations for KSS 2017. We would like to express our sincere thanks to the authors for their remarkable contributions, all the Technical Program Committee members for their time and expertise review with the papers under a very tight schedule, and the Springer for their professional help in the publication. This is the second time that KSS proceedings are published as a CCIS volume by Springer after success of the 2016 publication. We greatly appreciate our five distinguished scholars for accepting our invitation to deliver keynote speeches at the symposium. Last but not least, we are very indebted to the local organizers for their hard work. We were happy to witness not only cross-cultural learning and integration at the conference, but also academic achievements and professionalism refined into the essence of knowledge and systems sciences.

November 2017

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Jian Chen*, IASCYS & Tsinghua University, China*

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- Provincial Electricity Authority of Thailand (PEA, Thailand)
- Thailand Convention & Exhibition Bureau (TCEB, Thailand)

Invited Speakers

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Multi-agent Solutions for Supply-Demand Management in Smart Grid Markets

Abstract

A smart grid market is a complex and dynamic market with various participators, including energy generators, general consumers, interruptible consumers, storage consumers, or even small renewable energy producers, such as solar systems and windmills. Moreover, different participators exhibit a variety of behaviours. For instance, the behaviours of solar and wind energy producers are closely related to the weather conditions, while some interruptible consumers can co tribute extra energy to supply-demand balance. Besides, the large energy generators may produce variant quantities of energy from day to day. Due to the complexity and dynamics, it is of great challenge to manage supply-demand balance in the Smart Grid market.

Agent and multi-agent technologies offer potential solutions to the above challenge by using the capabilities of intelligent modelling, management and group collaboration, in addition to the learning and self-organising abilities and autonomous decision making of individual agents. This talk will introduce our two new solutions in smart grid research, including (1) an agent-based broker model for power trading in smart grid markets; and (2) a load forecasting approach in smart grid market through customer behaviour learning.

Bibliography

Dr. Minjie Zhang received her Bachelor of Computer Science degree from Fudan University, China in 1982 and her Ph.D. degree from the University of New England, Australia in 1996. She had been employed as a lecturer in Edith Cowan University and in Newcastle University; and a senior lecturer, then an associate professor in the University of Wollongong. Currently she is a full professor in the School of Computing and Information Technology, and the Director of The Centre for Big Data Analytics and Intelligent Systems at the University of Wollongong, Australia. She is a senior member of the IEEE and IEEE Computer Society.

Dr. Zhang is a leading researcher in the field of agent and multi-agent research and has edited 14 scholarly books with Springer and 5 special issues with reputable journals. She is the author, or co-author, of over 200 research papers including 65 papers in high impact journals. Dr Zhang is the chief investigator of 2 Australia Research Council (ARC) Discovery Grants, 1 ARC Linkage Grant and 1 ARC International Linkage Award and 1 large grant from Australia Defense Department. She has been the chair/co-chair of over 25 International conferences/workshops. She is also a Senior Committee Member for the International Conference on Autonomous Agent and Multi-agent Systems (AAMAS, the world top conference in agent and multi-agent research). Her research interests include multi-agent systems and their applications in complex domains, distributed artificial intelligence, smart modeling and simulation in complex systems, data mining and knowledge discovery, service-oriented systems, agent-based grid/cloud computing, and smart grid systems.

Invited Speakers

Peter A. Gloor

Research Scientist, MIT Center for Collective Intelligence,
Massachusetts Institute of Technology

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http://cci.mit.edu/pgloor/contact.html

From the Age of Emperors to the Age of Empathy

Abstract

The age of imperial CEOs residing in the corner office is over, Mark Zuckerberg shares the same open office space with the rest of his Facebook employees. Today's Millennials do not want to be lead by emperors high on testosterone and authority, but by leaders high on empathy and compassion.

This talk is based on my new books "SwarmLeadership" and "Sociometrics". "SwarmLeadership" introduces a framework based on "social quantum physics", which explains how all living beings are connected through empathy in entanglement, and learning. To track empathy, entanglement, and learning we have developed "seven honest signals of collaboration" which can be used to measure empathy, entanglement, and learning on any level, from the global level on social media, inside the organization with e-mail, down to face-to-face entanglement using the body sensors of smartwatches. The talk will present the main concepts and the underlying algorithms and models, documenting them by numerous industry examples from our own work.

Bibliography

A Research Scientist at the Center for Collective Intelligence at MIT's Sloan School of Management where he leads a project exploring Collaborative Inovation Networks. He is also Founder and Chief Creative Officer of software company galaxyadvisors, a Honorary Professor at University of Cologne, Distinguished Visiting Professor at P. Universidad Católica de Chile and Honorary Professor at Jilin University, Changchun, China. Earlier he was a partner with Deloitte and PwC, and a manager at UBS. He got his Ph.D in computer science from the University of Zurich and was a Post-Doc at the MIT Lab for Computer Science. His most recent books are "Sociometrics and Human Relationships" and "Swarm Leadership and the Collective Mind", both published by Emerald May 2017.

Invited Speakers

Yoshitsugu Hayashi

Professor of Chubu University, Full Membr of Club of Rome,
President of WCTRS, Chubu University

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Quality-of-Life (QOL) based Urban Transport Planning Utilising ICT

Abstract

The main stream of this keynote speech is 1) to network the existing transport system TukTuk by ICT, 2) to evaluate the performance of network plan based on time serial profile of QOL(Quality of Life) versus CO2 emission, 4) to propose options of policies combining infrastructure improvement by visualised 3D mappings, 5) to develop big data for planning.

Bibliography

Yoshitsugu Hayashi is Professor of Chubu University as well as Emeritus Professor, Nagoya University, Japan. He is also one of the 100 Full members of "Club of Rome" which is well known by its 1st report "The Limit to Growth" in 1972. At the same time he is President of WCTRS (World Conference on Transport Research Society) which attracts more than 1,300 members from 83 countries. Yoshitsugu Hayashi's background is Civil Engineering. The major fields of research are analysis and modelling of transport - land use interactions and the countermeasure policy to overcome negative impacts of urbanisation and motorisation. The results are published in such books as "Land Use, Transport and The Environment", "Urban Transport and the Environment - An International Perspective", "Intercity Transport and Climate Change - Strategies for Reducing the Carbon Footprint", the Japanese Edition of "Factor 5" originally authored by Ernst Ulrich von Weizsaecker, et.al, etc.

An application to practice includes his proposition of rail transit oriented urban reform to overcome Bangkok's hyper congestion as the leader of JICA project in mid 90's, which became the trigger to reverse the budget of road vs. rail from 1:99 in 90's to 82:14 in Transport 2020 Plan. He is also now the leader of JICA/JST research project "e-Integrated Smart Transport to Dually Achieve CO2 Reduction and People's Well-Being to support THAILAND 4.0". He is also a board member of the Engineering Academy of Japan, Ex-Vice President of JSCE (Japan Society of Civil Engineers) in charge of Redesigning Japan to be Resilient, Leader of a Global Center of Excellence Programme "From Earth System Science to Basic and Clinical Environmental Studies", and Leader of "Smart Shrink" movement as a key strategy for declining and aging cities. The results are published in such books as "Sustainability - Future Balance between Nature and Civilisation", "Sustainable Society after the Great East Japan Earthquake", "Diagnosis and Prescription for China's Urbanisation - Paradigm Change of Development and Growth", "Disaster Resilient Citie, Concepts and Practical Examples", etc.

Invited Speakers

Vilas Wuwongse

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Open Research Data and Research Support Systems

Abstract

"Research for the sake of research" is a phrase often used to criticize researches that do not lead to immediate applications in the real world. One way to overcome this criticism is to publish and share not only the end research results but also the data and evidences that produce them. As a matter of fact, a number of funding agencies, e.g., the National Science Foundation, have required researchers to attach to their research proposals to be considered for funding few pages of research data management plans. Four of the UK's leading research organisations, i.e., Higher Education Funding Council for England, Research Councils UK, Universities UK, and Wellcome Trust, have launched a concordat that will help to ensure that research data gathered and generated by members of the UK research community is made openly available for use by others wherever possible. They believe that open research data has the potential to deliver significant benefits to research and to wider society. This talk will demonstrate how open research data could be expressed by a standard representation language that can also describe other components of research activities, leading to a model for research support systems

Bibliography

Professor Vilas Wuwongse obtained his B.Eng and M.Eng in Control Engineering in 1977and 1979, respectively, and D.Eng in Systems Science in 1982, all from Tokyo Institute of Technology. He was a faculty member at the Asian Institute of Technology from 1982 to 2012 during which he also served as a Division Chairman and a Vice President. At present, he is an Advisor to the President for Education, Mahidol University. Prof. Wuwongse has chaired or co-chaired a number of international conferences and is serving as an editorial board member of international and national academic journals. His current research interests include linked data, metadata, e-Learning,

e-Research and research management. Prof. Wuwongse is now developing a set of metadata for e-Research and research management. The metadata set includes VIVO-based researcher profiles and metadata for research proposals, research proposal evaluation, progress reports, final reports as well as research data. It will support both the researchers and research funding organizations. Based on the metadata set, an open-source software system called Linked OpenScholar, an extension Harvard University's OpenScholar, has been developed and will be put into real use. In addition, Prof. Wuwongse has led a team to design and implement one the largest and most complicated information systems for the Thai Revenue Department. The system has been used for more than 10 years and is still active. He has published over 150 academic papers in journals and conferences and is currently interested in applicable research, particularly in the development of practical, open information systems for academic and research management.

Conference Overall Schedule

	Thursday, November 16, 2017 (Day 0)
16:00-18:00	**Registration**

	Friday, November 17, 2017 (Day 1)	
8:00-9:00	**Registration**	
9:00-9:20	**Opening Ceremony** **Jian Chen** *(President of ISKSS, Tsinghua University, China)* **Thanaruk Theeramunkong** *(Local Organization Representative)* ***Room: Ping - Wang***	
9:20-10:20	**Keynote Speaker 1: Minjie Zhang** *(Chair: Jian Chen)* ***Room: Ping - Wang***	
10:20-10:50	**Coffee Break**	
10:50-11:50	**Keynote Speaker 2: Peter A. Gloor** *(Chair: Xijin Tang)* ***Room: Ping - Wang***	
11:50-14:00	**Lunch (Room: The Terrace @ 72)**	
	Parallel Sessions	
	Room: Ping - Wang	**Room: Charoenkrung**
14:00-15:30	**Session 1: Complex System Modeling** *(Chair: Minjie Zhang)*	**Session 3: Social Media Processing** *(Chair: Peter Gloor)*
15:30-16:00	**Coffee Break**	
16:00-17:30	**Session 2: Multi-agent Simulation** *(Chair: Tieju Ma)*	**Session 4: Information Science** *(Chair: Chonghui Guo)*
18:00-20:00	**Welcome Reception**	

	Saturday, Noverber 18, 2017 (Day 2)	
8:40-9:45	**The Workshop on Artificial Intelligence and Internet of Things (AI2OT)** *(Chair: Narit Hnoohom)* ***Room: Ping - Wang***	
9:45-10:30	**Coffee Break**	
10:30-11:20	**Keynote Speaker 3: Vilas Wuwongse** *(Chair: Thepchai Supnithi)* ***Room: Ping - Wang***	
11:20-11:30	**Short Break**	
11:30-12:30	**Keynote Speaker 4: Yoshitsugu Hayashi** *(Chair: Thanaruk Theeramunkong)* ***Room: Ping - Wang***	
12:30-14:00	**Lunch (Room: The Terace @ 72)**	
	Parallel Sessions	
	Room: Ping - Wang	**Room: Charoenkrung**
14:00-15:30	**Session 5: Healthcare and Big Data** *(Chair: Thepchai Supnithi)*	**Session 7: Knowledge Science and Engineering** *(Chair: Vilas Wuwongse)*
15:30-16:00	**Coffee Break**	
16:00-17:30	**Session 6: Data Mining and Text Mining** *(Chair: Vincent C.S. Lee)*	**Session 8: Knowledge Management and Innovation** *(Chair: Jiangning Wu)*
17:30-18:00	**Closing Session** **Xijin Tang** *(General Secretary of ISKSS, CAS Academy of Mathematics and Systems Science of Mathematics and Systems Science, China)*	
18:00-21:30	**Banquet (Dinner cruising along the Chao Phraya River)** **(Registration at Lobby at 18:15)**	

	Sunday, November 19, 2017 (Day 3)
9:00-18:00	**Technical Visit** **(Registration at Lobby)**

Detailed Schedule

DAY 0 THURSDAY, NOVEMBER 16

Timetable	
16:00-18:00	Registration at Lobby

DAY 1 (1) FRIDAY, NOVEMBER 17

Timetable		
8:00-9:00	Registration	
9:00-9:20	**Opening Ceremony** **Jian Chen** *(President of ISKSS, Tsinghua University, China)* **Thanaruk Theeramunkong** *(Local Organization Representative)* ***Room: Ping - Wang***	
9:20-10:20	**Keynote Speaker 1: Minjie Zhang** *(Chair: Jian Chen)* ***Room: Ping - Wang***	
10:20-10:50	Coffee Break	
10:50-11:50	**Keynote Speaker 2: Peter A. Gloor** *(Chair: Xijin Tang)* ***Room: Ping - Wang***	
11:50-14:00	Lunch (Room: The Terrace @ 72)	
	Parallel Sessions	
	Room: Ping - Wang	**Room: Charoenkrung**
Session	**Session 1: Complex System Modeling** *(Chair: Minjie Zhang)*	**Session 3: Social Media Processing** *(Chair: Peter Gloor)*
14:00-15:30	**Dynamics of Brand Acceptance Influenced by the Spread of Promotive Information in Social Media** *Qian Pan, Haoxiang Xia, and Shuangling Luo*	**Forecasting the Duration of Network Public Opinions Caused by the failure of Public Policies: The Case of China** *Ying Lian, Xuefan Dong, Ding Li, and Yijun Liu*
	Complex Network's Competitive Growth Model of Degree-characteristic Inheritance *Hualu Gu, Xianduan Yang, and Shouyang Wang*	**Predicting Hashtag Popularity of Social Emergency by a Robust Feature Extraction Method** *Qianqian Li and Ying Li*
	Modeling of Interdependent Critical Infrastructures Network in Consideration of the Hierarchy *Chenghao Jin, Lili Rong, and Kang Sun*	**Societal Risk and Stock Market Volatility in China: A Causality Analysis** *Nuo Xu and Xijin Tang*
	Analysis on Influencing Factors on Cultivation of Graduate Innovation Ability Based on System Dynamics *Bing Xiao and Vira Chankong*	
15:30-16:00	Coffee Break	

DAY 1 (2) FRIDAY, NOVEMBER 17

Timetable		
	Parallel Sessions	
	Room: Ping - Wang	**Room: Charoenkrung**
Session	**Session 2: Multi-agent Simulation** *(Chair: Tieju Ma)*	**Session 4: Information Science** *(Chair: Chonghui Guo)*
16:00-17:30	**[JSSI] Duopoly Competition between Chauffeured Car and Taxi: An Analysis of Pricing and Market Segmentation** *Tong Yang, Jiangning Wu, and Jianjun Wang*	**An alternative fuzzy linguistic approach for determining criteria weights and segmenting consumers for new product development: A case study** *Sirin Suprasongsin, Van-Nam Huynh, and Pisal Yenradee*
	[JSSI] Mobility pattern of taxi passengers at intra-urban scale: empirical study of three cities *Menqiao Xu, Ling Zhang, Wen Li, and Haoxiang Xia*	**[Abstract] A novel two-sided matching method for knowledge transfer based on grey system** *Yuwen Zhang, Peng Li*
	[Abstract] Dynamics of the product space and nations'positions *Tieju Ma*	**A New Hybrid Linear-nonlinear Model based on Decomposition of Discrete Wavelet Transform for Time Series Forecasting** *Warut Pannakkong and Van-Nam Huynh*
	A Kind of Investor-Friendly Dual-Trigger Contingent Convertible Bond *Wenhua Wang and Xuezhi Qin*	**The Distributed Semantics of Extended Argumentation** *Nguyen Duy Hung*
18:00-20:00	**Welcome Reception**	

DAY 2 (1) SATURDAY, NOVEMBER 18

Timetable		
8:40-9:45	**The Workshop on Artificial Intelligence and Internet of Things (AI2OT)** *(Chair: Narit Hnoohom)* ***Room: Ping - Wang***	
9:45-10:30	**Coffee Break**	
10:30-11:20	**Keynote Speaker 3: Vilas Wuwongse** *(Chair: Thepchai Supnithi)* ***Room: Ping - Wang***	
11:20-11:30	**Short Break**	
11:30-12:30	**Keynote Speaker 4: Yoshitsugu Hayashi** *(Chair: Thanaruk Theeramunkong)* ***Room: Ping - Wang***	
12:30-14:00	**Lunch (Room: The Terrace @ 72)**	
	Parallel Sessions	
	Room: Ping - Wang	**Room: Charoenkrung**
Session	**Session 5: Healthcare and Big Data** *(Chair: Thepchai Supnithi)*	**Session 7: Knowledge Science and Engineering** *(Chair: Vilas Wuwongse)*
14:00-15:30	**Sequence-based Measure for Assessing Drug-Side Effect Causal Relation from Electronic Medical Records** *Tran-Thai Dang and Tu-Bao Ho*	**An ontology-based knowledge framework for Software Testing** *Shanmuganathan Vasanthapriyan, Jing Tian, and Jianwen Xiang*
	MANDY: Towards A Smart Primary Care Chatbot Application *Lin Ni, Chenhao Lu, Niu Liu, and Jiamou Liu*	**Concept Name Similarity Measure on SNOMED CT** *Htet Htet Htun and Virach Sornlertlamvanich*
	A Multi-Center Physiological Data Repository for SUDEP: Data Curation, Data Conversion and Workflow *Wanchat Theeranaew, Bilal Zonjy, James McDonald, Farhad Kaffashi, Samden Lhatoo, and Kenneth Loparo*	**[JSSI] Generating Storyline with Societal Risk from Tianya Club** *Yugai JIA, Xijin TANG*
	Comparative Study of Using Word Co-occurrence to Extract Disease Symptoms from Web Documents *Chaveevan Pechsiri and Renu Sukharomana*	**[Abstract] Dynamic Control Model for Knowledge Transfer in Industry-university Cooperation** *Jie Wu, Jiangang Wang, Yongxing Sheng, Peng Li, and Qinfen Shi*
15:30-16:00	**Coffee Break**	

DAY 2 (2) SATURDAY, NOVEMBER 18

Timetable		
	Parallel Sessions	
	Room: Ping - Wang	**Room: Charoenkrung**
Session	**Session 6: Data Mining and Text Mining** *(Chair: Vincent C.S. Lee)*	**Session 8: Knowledge Management and Innovation** *(Chair: Jiangning WU)*
16:00-17:30	**Emergency Attribute Significance Ranking Method Based on Information Gain** *Ning Wang, Haiyuan Liu, Huaiming Li, Yanzhang Wang, Qiuyan Zhong, and Xuehua Wang*	**The Effect of Task Allocation Strategy on Knowledge Intensive Team Performance Based on Computational Experiment** *Shaoni Wang, Yanzhong Dang, and Jiangning Wu*
	Mining Online Customer Reviews for Products Aspect-based Ranking *Chonghui Guo, Zhonglian Du, and Xinyue Kou*	**[Abstract] Differential Game Model for knowledge flow in University-Industry collaborative innovation** *Yu Yu and Qinfen Shi*
	An Empirical Analysis of the Chronergy of the Impact of Web Search Volume on the Premiere Box Office *Ling Qu, Guangfei Yang, and Donghua Pan*	**[AI2OT] A Comparative Annotator-agreement Analysis of Emotional Speech Corpora** *Piyawat Sukhummek, Jessada Karnjana, Sawit Kasuriya, Chai Wutiwiwatchai, and Thanaruk Theeramunkong*
	[JSSI]Conceptualizing Mining of Firm's Web Log Files *Ruangsak Trakunphutthirak, Yen Cheung, and Vincent C.S. Lee*	**[AI2OT] Virtual Reality Simulation for Health literacy Education** *Tayakorn Gindavichu, Thanchanok Khumgun, and Narit Hnoohom*
17:30-18:00	**Closing Session** **Xijin Tang** *(General Secretary of ISKSS, CAS Academy of Mathematics and Systems Science of Mathematics and Systems Science, China)*	
18:00-21:30	**Banquet (Dinner Cruising aliong the Chao Phraya River)** **(Registration at Lobby at 18:15)**	

DAY 3 SUNDAY, NOVEMBER 19

Timetable	
9:00-18:00	**Technical/Cultural Visit and Committee Meeting** **(Registration at Lobby)**

The Workshop on Artificial Intelligence and Internet of Things (AI2OT) Detailed Schedule

DAY 2 (WS-AI2OT) SATURDAY, NOVEMBER 18

Timetable	
	Room: Ping - Wang
Session	**The Workshop on Artificial Intelligence and Internet of Things (AI2OT)** *(Chair: Narit Hnoohom)*
8:40-9:45	**Scale Invariant Feature for Thai Banknotes Recognition System** *Narumol Chumuang and Mahasak Ketcham*
	Hydroponic Farming Analysis in Greenhouse Environment using IoT Technology *Promprasit Kanka, Arunee Ratikan, and Konlakorn Wongpatikaseree*
	Similarity-based Mismatch Analysis between Objective Interestingness Measures in Association Rules Mining *Rachasak Somyanonthanakul and Thanaruk Theeranumkong*

Abstract

Dynamics of Brand Acceptance Influenced by the Spread of Promotive Information in Social Media

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Abstract. In this paper we propose an agent-based model that combine the Ma- jority-Rule-based Voter model in opinion dynamics and the SI Model for in- formation spreading to analyze the dynamics of brand acceptance in social me- dia. We focus on two important parameters in diffusion dynamics: the decayed transmission rate (β) and the diffusion interval (θ). When the system is stable, the order parameter of the system is the duration time (τ). In the absence of opinion interaction, the simulation results indicate that, when a disadvantaged brand tries to occupy a large market share through social marketing approaches, it is always effective to let the opponent be the propaganda target. While with the Majority-Rule-based Voter model included, we observe that the opinion in- teraction could have a dual function, which show that a brand holding a small market share needs to adopt diverse marketing methods according to different population types.

Keywords: social marketing, dynamics of brand acceptance, opinion dynamics, diffusion dynamics.

Complex Network's Competitive Growth Model of Degree-characteristic Inheritance

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Abstract. Complex network is a kind of network between regular network and stochastic network. Inspired by biological evolution, we introduced resource competition and genetic inheritance into the growth process of network, and proposed a new growth model with the priority connection of scale-free network. Emulated analysis shows that the network model of competitive growth is no longer power-law, but it obeys exponential distribution. The competitive growth model of degree-characteristic inheritance is negative skew. And it shows a linear relationship between the logarithm of average degree and the network size, which is also proved by the mathematical deduction. In addition, the average clustering coefficient of network decreases with the increase of the genetic coefficient, while the average path length increases with the increase of the inherited coefficient. The whole model is topologically tunable. Different combinations of parameters can produce network models with different properties.

Keywords: exponential distribution, inheritance, competition, average degree, clustering coefficient, shortest path.

Modeling of Interdependent Critical Infrastructures Network in Consideration of the Hierarchy

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Abstract. With the development of socio-economic, interdependencies between critical infrastructures become much closer, that resulting in the fragility of the system. This paper proposes a model of interdependent critical infrastructures network in consideration of the hierarchy. Physical interdependence among critical infrastructures is taken into consideration. Even more specifically, the interdependent network is constructed by analyzing the energy, water supply, telecommunication and transportation, together with the consideration of the hierarchy structure. Moreover, within the interdependent network, the determining method of edges weight is developed on the basis of the supply capacity and quantity of critical infrastructures system elements, which helps to describe the regional characteristics. Finally, the interdependent network with the hierarchy is constructed by taking energy, water supply, telecommunication and transportation of a city in China as the objects. And the analysis on the structural characteristics of the network shows that energy nodes have a greater influence, which suggests that the energy related critical infrastructures need more attention.

Keywords: critical infrastructures, interdependent, physical interdependence, hierarchy, complex network.

Analysis on Influencing Factors on Cultivation of Graduate Innovation Ability Based on System Dynamics

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Abstract. The purpose of this paper is to clarify and determine the influencing factors on cultivation of graduate innovation ability. It is of great theoretical and practical significance to the graduate educational quality improvement and to the social and economic development as well as improvement of international competence. The present research applies the systematic thinking to propose the utilization of government-customer-industry-university-institute (GCIUI) practical cultivation mode to discuss the influencing factors on cultivation of graduate innovation ability. In the research, the systematic essence of cultivation of graduate innovation ability is firstly defined, and the systematic structural model for graduate innovation ability cultivation is constructed; then, the impacts which graduate enterprise, GCIUI practical cultivation mode and innovative environment have on graduate innovation ability are analyzed; finally, the System Dynamics software is applied to establish the System Dynamics flow chart for influencing factors on graduate innovation ability, and the dynamic modeling and simulation analysis are carried out. Simulation results show that, the graduate innovation ability improves as the government and university profit distribution ratios increase, and reduces as institute and customer profit distribution ratios increase. However, the influence from enterprise is lower compared to other entities. The influences of other parameters on graduate innovation ability rank from knowledge protection, enrollment examination, teacherstudent relationship, knowledge system, research projects and funds, incentive mechanism, construction of research platforms, technological exchange and cooperation to trust mechanism. Consequently, the formulation of each relevant policy should be systematically considered from graduate entity, cultivation of graduate innovation ability system structure and cultivation of graduate innovation ability environment.

Keywords: innovation ability, government-customer-industry-university institute (GCIUI) practical cultivation mode, influencing factors, system dynamics.

Duopoly Competition between Chauffeured Car and Taxi: An Analysis of Pricing and Market Segmentation

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Abstract. Chauffeured car service (CCS) has developed rapidly in recent years. Although CCS brings convenience and effectiveness, it also triggers some new problems like vicious competition. This work studies the duopoly competition between CCS company and taxi company, which have different average cost and number of vehicles. To find some solutions like the pricing scheme to ease the vicious competition, Hotelling model is introduced. A Hotelling-type model is used to present passengers' preferences to the companies. Besides, failing situation is introduced into the Hotelling model to describe the situation where passenger's demand is not satisfied in reality. This work analyzes the price scheme and equilibrium market segmentation based on the average cost and number of vehicles of each company. Furthermore, companies' profits, passengers' utility and social welfare in equilibrium are revealed based on the game theory. The study shows that both of companies can get optimal profits by setting effective price scheme. The company which has higher price, definitely gets less market share. In addition, moderate competition can lead to positive influence on social welfare.

Keywords: duopoly competition, chauffeured car service and taxi, price scheme, Hotelling model.

Mobility Pattern of Taxi Passengers at Intra-urban Scale: Empirical Study of Three Cities

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Abstract. The study of human mobility patterns is of both theoretical and practical values in many aspects. For long-distance travel, a few research endeavors have shown that the displacements of human travels follow a power-law distribution. However, controversies remain regarding the issue of the scaling laws of human mobility in intra-urban areas. In this work, we focus on the mobility pattern of taxi passengers by examining five datasets of three metropolitans. Through statistical analysis, we find that the lognormal distribution with a power-law tail can best approximate both the displacement and the duration time of taxi trips in all the examined cities. The universality of the scaling laws of human mobility is subsequently discussed, in view of the analysis of the data. The consistency of the statistical properties of the selected datasets that cover different cities and study periods suggests that, the identified pattern of taxi-based intra-urban travels seems to be ubiquitous over cities and time periods.

Keywords: human mobility pattern, taxi travel, displacements, duration time.

Dynamics of the product space and nations'positions

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Abstract. Hidalgo et. al (2007) simulated the moving of a single nation in the product space. Such simulation can reveal that a nation's current position in the product space will influence its future growth. But it does not consider the competition among nations. In this research, we aim to develop an agent-based model on nations' moving in a product space. In this model, multi-nations move in the product space simultaneously. Each of them tries to move to a better position in the product space, i.e., producing products which can bring more wealth to the nation. But there is competition among them. Nations move to a better position firstly will occupy the position for a while, and thus it will be difficult for others to move to this position. With the model, we can simulate the dynamics of the world economy as well as individual nation's economy. Little work has been done to explore the dynamics of the product space, with the international trade data from 1984 to 2014, we also analyze the dynamics of the product space.

Keywords: product space, international trade.

A Kind of Investor-Friendly Dual-Trigger Contingent Convertible Bond

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Abstract. If financial systemic crisis occurred, one of the effective countermeasures is to issue contingent securities like contingent convertible bonds (CoCos). In this paper, we present a new kind of CoCos which is of investor-friendly dualtrigger property, and it is called "Contingent Convertible bond after Converted" which can be put back at a discount price or converted into CoCos prior to an imminent financial systemic risk. We provided the design rule of this bond and a closed-form pricing formula under some assumptions, and this kind of bond is likely to be more powerful in loss absorbing capacity. Consequently, it is necessary to restrain investors' option to put the CoCoCo back in order to keep loss absorbing capacity more powerful, meaning to limit the discount ratio α less than 1.

Keywords: contingent capital, CoCos, investor-friendly, dual-trigger.

Forecasting the Duration of Network Public Opinions Caused by the failure of Public Policies: The Case of China

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Abstract. This paper is an effort to identify the factors that may affect the duration of network public opinions caused by failed public policies, and accordingly to propose a model that could predict the duration before the release of policies, in order to provide some rational suggestions to decision makers to reduce the risk of publishing public policies. This paper argues that these factors involve four dimensions: audience, environment, reality, and the Internet. 23 typical Chinese failed public policies happened in recent years and their caused network public opinions are taken as the dataset, and the multivariate regression model and the Cobb-Douglas production function are applied to form the models. Results show that the Cobb-Douglas production form based models could accurately predict the duration of network public opinions aroused by the failure of public policies.

Keywords: public policy, network public opinion, forecasting practice, multivariate regression model, cobb–douglas production function.

Predicting Hashtag Popularity of Social Emergency by a Robust Feature Extraction Method

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Abstract. Social emergency information is usually disseminated and driven by a hot topic described succinctly with a hashtag in social media.In China, hashtag prediction for social emergencies is more and more practical for E-governance. How to predict the hashtag popularity for social emergency has become a considerably important task. However, previous research mainly focused on commercial hashtag prediction, such as marketing and promotion. For the hashtag popularity prediction, the core issue is to identify the key features for improving prediction accuracy.To the best of our knowledge,there is few research focus on the feature extraction of hashtag for social emergency. In addition, we extract features for hashtag popularity prediction from "seed information" by avoiding excessive crawling. The "seed information" are the microblogs under a hashtag for a 24-h period since the hashtag was published. Based onthe"seed information", the user-based and content-based features are derived, which facilitate the spread of social emergency information. Furthermore,recursive feature elimination (RFE) analysis and nine machine learning classification models are integrated to determine the optimal features among all possible feature combinations. The effectiveness and robustness of our proposed features are verified.

Keywords: social emergency, hashtag, information diffusion, prediction.

Societal Risk and Stock Market Volatility in China: A causality analysis

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Abstract. A variety of societal contradictions and conflicts are exposed in China along the process of economic and social transformation. Online societal risk perception is acquired by public searching behavior which has been mapped into respective societal risks based on indicators including national security, economy/finance, public morals, daily life, social stability, government management, and resources/ environment. A stable and harmonious society is the basic guarantee for the sound development of the stock market. What we concern about is whether the variations of the societal risk are related to stock market volatility. The correlations between societal risk and stock market volatility are investigated. Although there is no trading data on holidays and weekends, the risk information of no-trading days is also taken into consideration to discuss if there are any impacts on stock market volatility. Three different econometric approaches are developed to explore the relationship between them. The results show that the risk of finance/economy, social stability, and government management could cause the fluctuation of stock market. Moreover, risk information of no-trading days has an impact on the stock's volatility as well. The research demonstrates that capturing online societal risk based on public searching data is feasible and significant.

Keywords: societal risk perception, stock market volatility, granger causality test, multiple linear regression.

Research on Stock Price Forecasting Based on News Sentiment Analysis

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Abstract. News, as a medium of information transmission, is regarded as an authoritative source of information. Recently, the rapid development of digital media set off a small peak of electronic news. On one hand, Investors are pressing the need for insider information, and on the other hand, investors are confronted with the massive text of agglomeration, which seems to provide an opportunity for text analysis. In addition, the Global Artificial Intelligence Technology Conference (GAITC) held in China's National Conference Center in May 2017 mentioned the concept of intelligent finance, indicating that public opinion analysis will become a hot research topic in the future financial field. In this context, the study of stock price forecasting by mining the sentiment contained in the news text came into being. The significance of this study is that, from a macro point of view, this article will help the country understand the characteristics of the stock behavior and business trends, so as to formulate economic policies; from a micro perspective, this article will help enterprises and ordinary investors to develop decision-making and maintain fair trading.

Keywords: news sentiment, text snalysis, stock price forecasting, VAR.

An Alternative Fuzzy Linguistic Approach for Determining Criteria Weights and Segmenting Consumers for New Product Development: A Case Study

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Abstract. In new product development, identifying a product concept (criterion) and a market segment is a critically important issue. To do so, it is necessary to deal with uncertainties in an evaluation process. In this paper, we introduce a) an alternative function principle based approach for coping with inter-relation uncertainties in human criteria assessment and heterogeneity of decision makers, in determining criteria weights for a multiple criteria group decision making problem b) an alternative intersected area based approach in segmenting consumers for new product development. A case study is used to illustrate the discussed approaches. The proposed approaches are helpful to alleviate the tediousness of the mathematical operations and also make the fuzzy linguistic approach for a multiple criteria group decision making problem more convenient and practical to be used.

Keywords: function principle, pascal triangular graded mean approach, linguistic term set, unknown criteria weights, market segmentation.

A Novel Two-sided Matching Method for Knowledge Transfer Based on Grey System

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Abstract. To obtain more competitive advantages, a large amount of enterprises begin to realize the importance of knowledge. They gradually join the industrial technology innovation alliance with colleges to acquire the progressive knowledge of the universities., by which they want to obtain market competitiveness and achieve mutual benefit. By this way, both enterprises and universities have more opportunities to achieve the situation of win-win cooperation. From the aspect of the result of knowledge transfer, knowledge transfer behavior is actually transferred to the enterprise by some certain approaches and is a partner relationship between them. Up to now, many researchers have carried on a great deal of studies on partner selection of alliance knowledge transfer. However, the research on main subject' decision-making behavior of knowledge transfer and knowledge characteristics, transfer situation and other factors on the influence of the subject selection behavior are relatively little. To cope with this issue, the two-sided matching methods are used to construct alliance knowledge transfer subject selection model. By considering psychological preference, risk aversion and the main selection of environmental uncertainty on the impact of partner selection, a novel method is proposed.

Keywords: alliance knowledge transfer, subject selection, two-sided matching, cumulative prospect theory, grey system theory.

A New Hybrid Linear-nonlinear Model based on Decomposition of Discrete Wavelet Transform for Time Series Forecasting

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Abstract. Time series forecasting research area generally aims at improving prediction accuracy. Discrete wavelet transform (DWT) has been applied to time series for decomposing it into approximation and detail. Nevertheless, typically, the property of the approximation and the detail are presumed as either linear or nonlinear. Actually, the purpose of the DWT is not decomposing the original time series into linear and nonlinear time series. Hence, this paper develops a new hybrid model of autoregressive integrated moving average (ARIMA), artificial neural network (ANN), and the DWT without prior assumption on linear and nonlinear property of the approximation and the detail. The different Khashei and Bijari's hybrid models involving the ARIMA and the ANN are built for the approximation and the detail in order to extract their both linear and nonlinear components and fit the relationship between the components as the function instead of additive relationship. Finally, the forecasted approximation and detail are combined to obtain final forecasting. The prediction capability of the proposed model is examined with two well-known time series: the sunspot and the Canadian lynx time series. The results show that the proposed model has the best performance in all two data sets and all three measures (i.e. MSE, MAE and MAPE).

Keywords: hybrid model, time series forecasting, autoregressive integrated moving average (ARIMA), artificial neural network (ANN), discrete wavelet transform (DWT).

The Distribution Semantics of Extended Argumentation

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Abstract. The distribution semantics is a de facto approach for integrating logic programming with probability theory, and recently has been applied for the standard abstract argumentation framework. In this paper, we define the distribution semantics for extended argumentation frameworks, and moreover derive inference procedures from existing proof procedures of such extended argumentation frameworks. While doing so we focus on extended argumentation frameworks with attacks on attacks and the inductive defense semantics thereof. However our results can be easily obtained for other extended frameworks and semantics.

Keywords: distribution semantics, argumentation, procedures.

Sequence-based Measure for Assessing Drug-Side Effect Causal Relation from Electronic Medical Records

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Abstract. The recent prevalence of electronic medical records offers a new way to identify likely drug-side effect causal relations. However, it faces with a big challenge due to simultaneously taking multiple drugs by patients then a mixture of side effects of these drugs is observed that forms a huge space of possible relations between the drugs and the effects, and makes a confusion in distinguishing causal relations from non-causal ones. Most of existing methods, which use frequency-based measures to quantify the association strength between the drugs and the effects, perform rather low accuracy. Therefore, we propose a novel measure called sequence-based measure that bases on the assumption about the association between side effects exposing during the treatment period. The experimental results show an effectiveness of using the proposed measure in detecting proper causal relations in comparison with existing methods, as well as reflect the likelihood of the assumption.

Keywords: electronic medical records, drug-side effect causal relation, sequence-based measure.

MANDY: Towards A Smart Primary Care Chatbot Application

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Abstract. The paper reports on a proof-of-concept of Mandy, a primary care chatbot system created to assist healthcare staffs by automating the patient intake process. The chatbot interacts with a patient by carrying out an interview, understanding their chief complaints in natural language, and submitting reports to the doctors for further analysis. The system provides a mobile-app front end for the patients, a diagnostic unit, and a doctor's interface for accessing patient records. The diagnostic unit consists of three main modules: An analysis engine for understanding patients symptom descriptions, a symptom-to-cause mapper for reasoning about potential causes, and a question generator for deriving further interview questions. The system combines data-driven natural language processing capability with knowledge-driven diagnostic capability. We evaluate our proof-of-concept on benchmark case studies and compare the system with existing medical chatbots.

Keywords: medicare chatbot, patient interview, natural language processing, AI and healthcare.

A Multi-Center Physiological Data Repository for SUDEP: Data Curation, Data Conversion and Workflow

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Abstract. For any rare diseases, patient cohorts from individual medical research centers may not have sufficient statistical power to develop and verify/validate disease biomarkers as results of either small sample size or lack of patient-level predictors of the disease often in the form of recorded biological signals integrated with clinical data. Continuous recording is thus becoming a necessary step in the research to identify these biomarkers. The creation of a biological signals repository on top of a clinical data repository from multiple centers is thus a catalyst for current and future research of rare diseases. In this paper, several issues are considered in order to combine recorded physiological measurements from multiple centers to create a collaborative Big Data repository. Practical challenges including standardization of clinical information as well as physiological data are addressed. A case study of the Big-Data challenges associated with creating a large physiological data repository for the study of SUDEP (Sudden Unexpected Death in Epilepsy) as a part of the CSR (Center for SUDEP Research) study is presented. This includes end-to-end workflow from obtaining the source waveform data to storing standardized data files in the multi-center repository. This workflow has been implemented at Case Western Reserve University in partnership with University Hospitals to standardize data from multiple SUDEP centers that include Nihon Kohden, Micromed, and Nicolet physiological signal formats converted to European Data Format (EDF). A combination of existing third party, proprietary, and in-house-developed software tools used in the workflow are discussed.

Keywords: epilepsy, SUDEP, physiological data repository, multi-center, EEG.

Comparative Study of Using Word Co-occurrence to Extract Disease Symptoms from Web Documents

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Abstract. The research aim is a comparative study of using different word cooccurrence sizes as the two word co-occurrence and the N word co-occurrence on verb phrases to extract disease symptom explanations from downloaded hospital documents. The research results are applied to construct the semantic relations between disease-topic names and symptom explanations for enhancing the automatic problem-solving system. The machine learning technique, Support Vector Machine, and the similarity score determination are proposed to solve the boundary of simple sentences explaining the symptoms for the two word co-occurrence and the N word co-occurrence respectively. The symptom extraction result by the N word co-occurrence provides the higher precision than the two word co-occurrence from the documents.

Keywords: word co-occurrence, event boundary, symptom explanation.

Emergency Attribute Significance Ranking Method Based on Information Gain

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Abstract. In emergency management, it is important to measure the significance of emergency attributes. This paper proposes a method for ranking the significance of attributes. Firstly, it builds the emergency decision table based on rough set theory. Secondly, it uses information gain to measure the objective significance of emergency attributes. Further, the information gain is combined with the prior knowledge of experts to rank the total significance of emergency attributes. This method could help decision-makers identify the significance of attributes, providing a support for the decision-makers to take emergency response measures.

Keywords: emergency management, rough set, significance ranking, information gain.

Mining Online Customer Reviews for Products Aspect-based Ranking

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Abstract. Massive online reviews contain a lot of useful information that can not only provide purchasing decision support for consumers, but also allow producers and suppliers to understand the competitive market. This paper proposes a new aspect-based online reviews mining method, which combines both textual data and numerical data. Firstly, the probability distribution of topics and words is constructed by LDA topic model. With word cloud images, the keywords are visualized and corresponding relationship between LDA topics and product reviews is analyzed. The weight of each aspect is calculated based on the probability distribution of documents and topics. Then, the dictionarybased approach is used to calculate the objective sentiment values of the product. The subjective sentiment tendency from different consumers because of their different individual needs are also taken into consideration. Finally, the directed graph model is constructed and the importance of each node is calculated by improved PageRank algorithm. The experimental results illustrate the feasibility of proposed mining method, which not only makes full use of massive online reviews, but also considers individual needs of consumers. It provides a new research idea for online customer review mining and personalized recommendation.

Keywords: online review mining, LDA topic model, improved page rank algorithm, personalized recommendation.

An Empirical Analysis of the Chronergy of the Impact of Web Search Volume on the Premiere Box Office

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Abstract. This paper studies the chronergy of the effects of pre-release search volume for movies and stars and the heterogeneity in the effects of our focal variables across the various movies. We sample the panel data of 593 movies released in China and our estimation is based on multiple sets of multiple linear regression contrast models. The main findings are: 1) only search volume for movies within 3 weeks before the release of movies has positive and significant effect on premiere box office; 2) the search volume for leading actors generated until 3 weeks before the movies' release affects the premiere box office significantly; 3) these effects vary with genre and showing time. On the basis of these empirical results, we put forward some suggestions on the use of search volume data in box office studies and film marketing.

Keywords: premiere box office, web search volume, chronergy, heterogeneity.

Conceptualizing Mining of Firm's Web Log Files

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Abstract. In this era of a data-driven society, useful data (Big Data) is often unintentionally ignored due to lack of convenient tools and expensive software. For example, web log files can be used to identify explicit information of browsing patterns when users access web sites. Some hidden information, however, cannot be directly derived from the log files. We may need external resources to discover more knowledge from browsing patterns. The purpose of this study is to investigate the application of web usage mining based on web log files. The outcome of this study sets further directions of this investigation on what and how implicit information embedded in log files can be efficiently and effectively extracted. Further work involves combining the use of social media data to improve business decision quality.

Keywords: web usage mining, web log files, big data, machine learning, business intelligence.

An Ontology-based Knowledge Framework for Software Testing

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Abstract. Software development is conceptually a complex, knowledge intensive and a collaborative activity, which mainly depends on knowledge and experience of the software developers. Effective software development relies on the knowledge collaboration where each and every software engineer shares his or her knowledge or acquires knowledge from others. Software testing which is a sub area of software engineering is related to various activities such as test planning, test case design, test implementation, test execution and test result analysis and they are all essential. Given great importance to knowledge for software testing, and the potential benefits of managing software testing knowledge, an ontological approach to represent the necessary software testing knowledge within the software testers' context was developed. Using this approach, software testing ontology to include information needs identified for the software testing activities was designed. Competency questions (contextualized information) were used to determine the scope of the ontology and used to identify the contents of the ontology because contextualized information fulfills the expressiveness and reasoning requirements of the software testing ontology. SPARQL query was used to query the competency questions. A web based KM Portal was developed using semantic web technologies for knowledge representation. Software testers can annotate their testing knowledge with the support of ISTQB and IEEE 829-2008 terms. Both ontology experts and non-experts evaluated the developed ontology. We believe our software testing ontology can support other software organizations to improve the sharing of knowledge and learning practices.

Keywords: software testing ontology, software testing knowledge, ontology based knowledge sharing, knowledge management system.

Concept Name Similarity Measure on SNOMED CT

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Abstract. The semantic similarity measure between biomedical terms or concepts is a crucial task in biomedical information extraction and knowledge discovery. Most of the existing similarity approaches measure the similarity degree based on the path length between concept nodes as well as the depth of the ontology tree or hierarchy. These measures do not work well in case of the "primitive concepts" which are partially defined and have only few relations in the ontology structure. Namely, they cannot give the desired similarity results against human expert judge on the similarity among primitive concepts. In this paper, the existing two ontology-based measures are introduced and analyzed in order to determine their limitations with respect to the considered knowledge base. After that, a new similarity measure based on concept name analysis is proposed to solve the weakness of the existing similarity measures for primitive concepts. Using SNOMED CT as the input ontology, the accuracy of our proposal is evaluated and compared against other approaches with the human expert results based on different types of ontology concepts. Based on the correlation between the results of the evaluated measures and the human expert ratings, this paper analyzes the strength and weakness of each similarity measure for all ontology concepts.

Keywords: concept name similarity measure, text similarity, natural language processing, SNOMED CT, semantic similarity.

Generating Storyline with Societal Risk from Tianya Club

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Abstract. Major societal problems affect the social stability. It is necessary to understand the public opinion toward those issues to avoid social conflicts. Nowadays the social media become the major platform to track what the public is concerned about and which may be of the societal risk. However, it is very tough to capture the public attention in short time due to huge flow of user-generated contents. In this paper, we approach this problem by expanding the method of generating storyline with the result displayed by a multi-view graph. One real-world example is illustrated and evaluation is given to show the effectiveness of the proposed method.

Keywords: Societal risk, Storyline, Multi-view graph, Dominating set, χ^2 statistic.

Dynamic Control Model for Knowledge Transfer in Industry-university Cooperation

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Abstract. After the human society entered the 21st century, science and technology developed at an unprecedented speed, which brought profound change This paper used the game theory to study knowledge transfer during the industry-university cooperation based on the existing knowledge transfer related research results. Based on Hauri's dynamic control of conflict model and the characteristics of industry-university cooperation, this paper viewed university and enterprise as the two control bodies, and constructed the dynamic control model of knowledge transfer in the alliance and the target income function of the university and enterprise. the model suggests that knowledge output of the university and knowledge absorption of the enterprise are affected by the time, the natural growth rate, the level of resource constraint, their symbiotic relationship, cooperative behaviors and their own behaviors. The university and enterprise try to maximize their own economic interest by adjusting the control inputs of knowledge transfer, which not only affects its own profitability, but also impact on its partner's. They may cooperate in pursuit of the maximum of total economic interest, and may also conflict in pursuit of the maximum of their own economic interest.

Keywords: dynamic control model, knowledge transfer, industry-university cooperation.

The Effect of Task Allocation Strategy on Knowledge Intensive Team Performance Based on Computational Experiment

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Abstract. The purpose of this study is to research the task allocation problem of the knowledge intensive team (abbreviated as KIT), which is different from the traditional task assignment. We built a KIT system model, designed task allocation strategies and team performance measurement scale, based on complex adaptive system (abbreviated as CAS) theory with regarding the knowledge requirement of tasks as a primer mover, additionally, took into consideration that knowledge exchange behaviors and processes would be contingent when different team members deal with different tasks. The computational experimental method was used to analyze how different allocation strategies impact KIT performance. The experimental results show that different allocation strategies variously influence KIT performance when the team members, team structures, and tasks to be assigned are different. We would be appreciated to help the decision maker, before the real tasks are executed, to apply the computational experiment method proposed in this paper to carry out the task allocation to provide with decision support.

Keywords: knowledge intensive team, task allocation strategies, team performance, computational experiment.

Science and Technology Preview Based on Intelligent Convergence in Open Network Environment

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Abstract. After the human society entered the 21st century, science and technology developed at an unprecedented speed, which brought profound changes to the political, economic, social development and people's life. Globalization makes economic and technological competition increasingly fierce, emerging multi-disciplines and interdisciplinary technology continue to emerge, greatly increasing the difficulty, risk and input costs of new technology development. Accurate grasp of the future development trend of science and technology, determining the focus of research and development areas, and building national and regional innovation system in line with the future development, is currently the primary issue. Technical foresees came into being. An intensive literature review is provided.

Keywords: intelligent convergence, open network environment.

Differential Game Model for knowledge flow in University-Industry collaborative innovation

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Abstract. This paper studies knowledge sharing between enterprise and university in Industry-University Collaborative Innovation with differential game and the differential game model is developed. The equilibrium knowledge-sharing strategies of enterprise and university are obtained in Nash game, Stackelberg game and cooperative game using Hamilton-Jacobi-Bellman equation. This paper compares the equilibrium knowledge-sharing strategies in Nash game, Stackelberg game and cooperative game.

Keywords: industry-university, knowledge sharing, differential game, feedback nash equilibrium, feedback stackelberg equilibrium.

A SAT View on Technological Capability Structure of China's Automobile Firm - The Case Study of GAC Group

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Abstract. The paper provides new perspective for evaluating TC evolution process. An new method is carried out to examine how stages, activity and technique changes in different stage of innovation process, and how they change and interact each other to shape the TC structure over time. The paper also offers insights in presenting detailed case study of successful independent innovation firm in China.

Keywords: technology innovation, technological capability structure, SAT Model, generic technology.

The Workshop on Artificial Intelligence and Internet of Things (AI2OT)'s Abstract

A Comparative Annotator-agreement Analysis of Emotional Speech Corpora

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Abstract. This paper proposes three methods for removing or filtering out ambiguous utterances: the filtering based on the first label prefer- ence and majority vote, the filtering based on full consensus, and the filtering based on the first label preference and full consensus. We inves- tigate two corpora, which are Interactive Emotional Dyadic Motion Cap- ture Database (IEMOCAP) and Emotional Tagged Corpus on Lakorn (EMOLA). The first corpus is an English language corpus whereas the second one is a Thai language corpus, and both are annotated by six annotators. We primarily study only four emotions, which are anger, happiness, neutral, and sadness. The experimental results show that, once the emotionally ambiguous utterances are removed from a corpus by the proposed methods, and then the corpora are used in training and testing emotion recognition models, the accuracy results improve consid- erably compared with those of emotion recognition models trained and tested by the original corpora. In the best case, the accuracy improves by 37.47 percents. Also, the proposed methods can considerably improve the reliability of agreement among annotators.

Keywords: annotator-agreement analysis, inter-annotator reliability measurement, IEMOCAP corpus, EMOLA corpus, HMM-based emotion recognition

Hydroponic Farming Analysis in Greenhouse Environment using IoT Technology

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Abstract. Agriculture is the main sector of Thailand economy. Thai farmer has an excellent experience to grow up the agricultural product. However, transfer-ring knowledge to next generation is one of the main problems. In this paper, we aim to analyze the significant p rameters that affect in farming. To achieve the goal, IoT technology is applied in hydroponic farming in greenhouse environ-ment. Two greenhouses are setup for comparison between the IoT farming and traditional farming. Several environmental sensors are deployed in IoT farm in order to collect the environmental data in green house. The collected data, in-cluding air temperature, water temperature, pH and EC which are used to analyze the relationship among the environmental data. Two foggy spray systems are pre-sented to regulate the temperature in greenhouses. The results give a good knowledge for the new farmer at the preparation stage, and the analyzed results can be used for conduct the IoT farm smarter.

Keywords: IoT Technology, Hydroponic Farming, Greenhouse Environment, Environmental data.

Similarity-based Mismatch Analysis between Objective Interestingness Measures in Association Rules Mining

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Abstract. Association analysis is a mining method to discover the interesting rule among items or events towards creation of new knowledge. A large number of objective interestingness measures proposed to evaluate such relationship among feature in dataset. However, their characteristics and interrelations are not well explored. This work use a set of synthesis patterns $A \rightarrow B$, expressing possible situations for the rule and based on contingency table. The similarity-base missmatch method is proposed to analysis the relation between five basis derivative; $P(A)/P(B)$, $P(A) \times P(\neg A)$, $P(B) \times P(\neg B)$, $P(A) \times P(\neg B)$, $P(B) \times P(\neg A)$and 21 interestingness measures for understanding their common characteristics.

Keywords: Assocoation Rule, Mismatch Analysis, Objective Interstingness.

Virtual Reality Smulation for Health literacy Education

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Abstract. The purpose of this research is to create a virtual reality game that can revolutionize the educational tools. Virtual reality was often viewed as an entertainment tools that create just for entertaining users through simu-lation of realistic environment. However, it could be more than just an en-tertainment system. It could be used as an educational tool that could ac-cess information like never before. To use virtual reality to its maximum potential, this research was created in order to educate and entertain players in form of the virtual world. This research was aimed for educating users about basic symptoms and how to treat it. Moreover, it also provides knowledge on how to handle and uses medicines properly. Three scenario will be simulated in this game which are probiotic and antibiotic, dengue fever, and parasites. Each of the scenario will have different information and interaction method that the participant can play with. This research was evaluated by 10 participants. Paired T-test was used to analyses the result of the questionnaire. It showed that the participant response toward the game was positive. Moreover, the information that provided in the game were significant.

Keywords: Virtual reality game, Medical, HTC Vive.

Scale Invariant Feature for Thai Banknotes Recognition System

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Abstract. In this paper introduced a recognition method for Thai banknotes by using artifi-cial vision. It is shown that the Thai banknotes can be classified by extracting their landmarks and key point descriptors, with the RGB space and Scale Invari-ant Feature Transform, respectively. We show the recognition results performed with the current Thai banknotes. Our algorithm has satisfy performance with ac-curacy high rate 80%. We state that the proposed method unlimited of image il-luminance, location, scale and orientation. Because of this, it makes our method easy to use. Moreover it can be applied to recognize banknotes of other countries which employ key point to distinguish the denominations.

Keywords: Thai banknote, recognition, visually impaired, SIFT, Scale Invariant Feature Transform.

Author Index

A

Arunee Ratikan 58

B

Bilal Zonjy 42
Bing Xiao 27

C

Chai Wutiwiwatchai 57
Chaveevan Pechsiri 43
ChengHao Jin 26
Chenhao Lu 41
Chonghui Guo 45

D

Ding Li 32
Donghua Pan 46

F

Farhad Kaffashi 42

G

Guangfei Yang 46

H

Haiyuan Liu 44
Haoxiang Xia 24, 29
Htet Htet Htun 49
Huaiming Li 44
Hualu Gu 25

J

James McDonald 42
Jessada Karnjana 57
Jiamou Liu 41
Jiangang Wang 51
Jiangning Wu 28, 52
Jianjun Wang 28
Jianwen Xiang 48
Jie Wu 51
Jing Tian 48

K

Kang Sun 26
Kenneth Loparo 42
Konlakorn Wongpatikaseree 58

L

LiLi Rong 26
Lingling Zhang 35, 53
Ling Qu 46
Ling Zhang 29
Lin Ni 41

M

Mahasak Ketcham 61
Man Huang 55
Mei Hao 35
Menqiao Xu 29

N

Narit Hnoohom 60
Narumol Chumuang 61
Nguyen Duy Hung 39
Ning Wang 44
Niu Liu 41
Nuo Xu 34

P

Peng Li 37, 51
Pisal Yenradee 36
Piyawat Sukhummek 57
Promprasit Kanka 58

Q

Qian Pan 24
Qianqian Li 33
Qinfen Shi 51, 54
Qiuyan Zhong 44

R

Rachasak Somyanonthanakul 59
Renu Sukharomana 43
Ruangsak Trakunphutthirak 47

S

Saiji Fu 35
Samden Lhatoo 42
Sawit Kasuriya 57
Shanmuganathan Vasanthapriyan 48
Shaoni Wang 52
Shouyang Wang 25
Shuangling Luo 24
Sirin Suprasongsin 36

T

Tayakorn Gindavichu 60
Thanaruk Theeramunkong 57
Thanaruk Theeranumkong 59
Thanchanok Khumgun 60
Tieju Ma 30
Tong Yang 28
Tran-Thai Dang 40
Tu-Bao Ho 40

V

Van-Nam Huynh 36, 38
Vincent C.S. Lee 47
Vira Chankong 27
Virach Sornlertlamvanich 49

W

Wanchat Theeranaw 42
Warut Pannakkong 38
Wenhua Wang 31
Wen Li 29

X

Xianduan Yang 25
Xijin Tang 34, 50
Xinyue Kou 45
Xuefan Dong 32
Xuehua Wang 44
Xuezhi Qi 31

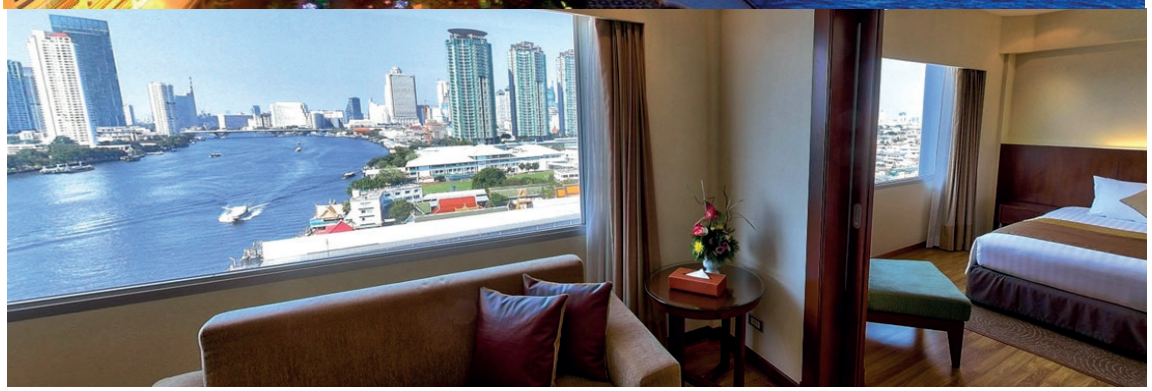
Y

Yanzhang Wang 44
Yanzhong Dang 52
Yen Cheung 47
Yijun Liu 32
Ying Li 33
Ying Lian 32
Yongxing Sheng 51
Yugai Jia 50
Yuwen Zhang 37
Yu Yu 54

Z

Zhonglian Du 45

Venue



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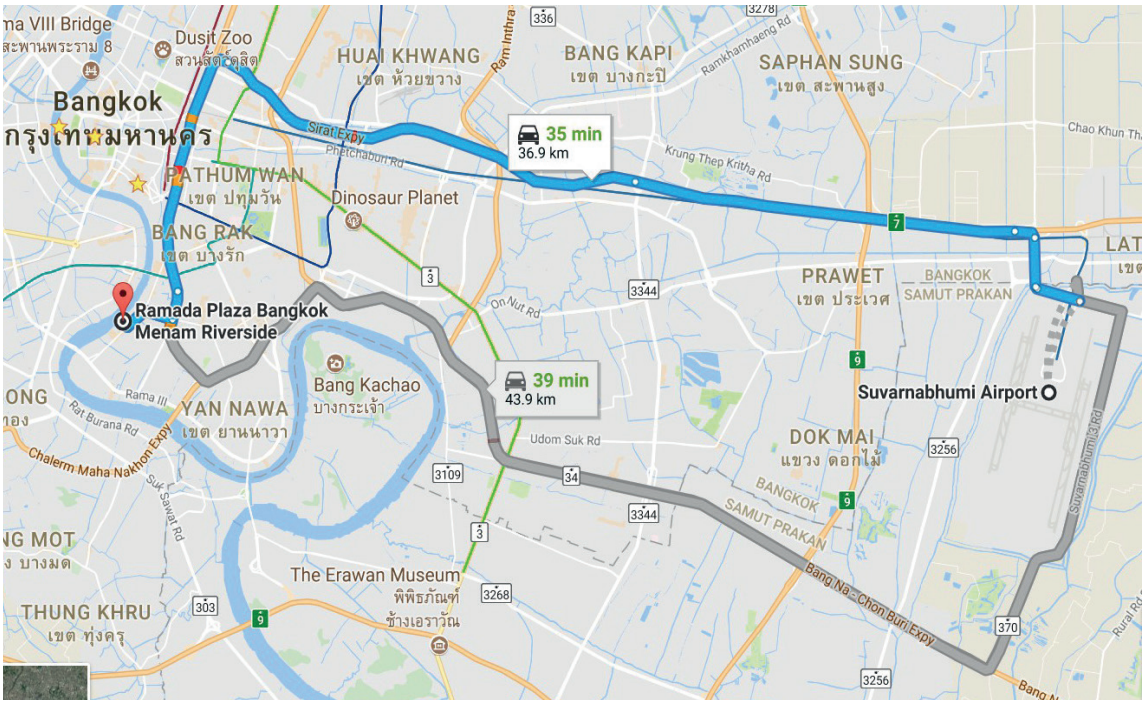
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Dusit Zoo
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พระปิ่นเกล้า
Rama 8 Bridge
พระราม 8
Phra Arthit
Khaosan Road
Thonburi Railway
ท่ารถไฟ
Maharaj
Wang Lang (Siriraj)
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