ICCBDAI2021

THE 2ND INTERNATIONAL CONFERENCE ON COMPUTER, BIG DATA AND ARTIFICIAL INTELLIGENCE

ICCBDAI

2021

Nov 11. 12-14
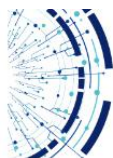
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ICCBDAI 2021

The 2nd International Conference on Computer, Big Data and Artificial Intelligence

On 12th-14th November 2021

Conference Program

Co-Sponsored by

Content

Welcome letter

Data has been with the evolution of human society, which has carried the efforts of human beings to understand the world based on data and information and the great progress we have made. However, it was not until the emergence of modern information technology represented by electronic computers, which provide automatic methods and means for data processing, that the human ability to master data and process data has achieved a qualitative leap. Information technology and its application in all aspects of economic and social development (i.e., informatization) have promoted data (information) as another important strategic resource after material and energy.

The conference aims to build a high-end frontier communication platform in the field of high performance computing, big data and artificial intelligence, promote the exchange and cooperation of experts and scholars at home and abroad, and promote the innovation and development of big data technology industry. The conference will bring together experts, scholars and industrial talents to jointly conduct open discussions on international hot topics, core key technologies, industrial development and challenges, etc.

We warmly invite you to participate in ICCBDAI2021.

Wish you a fruitful and joyful conference!

History

ICCBDAI 2020 was successfully during 23-25 October, Changsha, 2020!

The ICCBDAI 2020 conference proceedings (Online ISSN: 1742-6596 Print ISSN: 1742-6588) is archived in the IOP Digital Library.And the papers have been indexed in EI compendex and Scopus!

Conference Photos:

ICCBDAI 2021 Nov.12-14, 2021 Beihai,China
International Conference on Computer, Big Data and Artificial Intelligence

Committee

General Chairs

Prof. Kehua Guo
Central South University, China

Prof. Wangdong Yang
Hunan University, China

Prof. Laurence T. Yang
St. Francis Xavier University,Canada

Prof. Chi Liu
Beijing Institute of Technology, China

Prof. Limin Xiao
Beihang University, China

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Hunan University of Finance and Economics, China

Prof. Zhihui Zhan

South China University of Technology, China
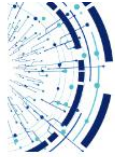
Technical Chairs

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Assoc. Prof. Yunze He

Technical Program Hunan University, China

Prof. Senzhang Wang

Nanjing University of Aeronautics and Astronautics, China

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Tiangong University, China

Prof. Xiaoyong Zhang

University of Beijing Information Science and Technology, China

Prof. Ming Yu

Hebei University of Technology, China

Prof. Deyu Zhang

Central South University, China

Publication Chairs

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Beijing University of Posts and Telecommunications, China

Prof. Zhanshan Li

Jilin University, China

Dr. Hui Fang

Loughborough University, U.K
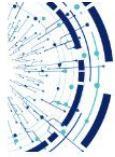
Technical Program Committees

Prof. Wei Wei

Xi'an University of Technology, China

Prof. Hui Liu

Xi'an University of Technology, China

Prof. Tiecheng Song

Chongqing University of Posts and Telecommunications, China

Prof. Chunqiao Mi

Huaihua University, China

Prof. Hao Li

Echnische Universiteit Delft, Holland

Prof. Philippe Fournier-Viger

Harbin Institute of Technology, China

Prof. Yining Liu

Guilin University of Electronic Technology, China

Prof. Xianhua Wu

Shanghai Maritime University, China

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University of illinois at urbana-champaign, USA

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Dept. of Civil Engineering, Turkey

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Prof. Ruikun Mai

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Prof. Wenquan Cao

PLA Army Engineering University, China

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Dr. Xiaokang Zhou

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Dr. Zhibo Wang

East China University of Science and Technology, China
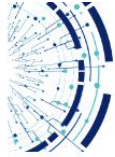
Prof. hongbo Liu

University of Electronic Science and Technology of China, China

Prof. Gongming Zhao

University of Science and Technology of China, China

Prof. Yangming Zhao

University of Science and Technology of China, China

Workshops

1.Big Data Technology and Application

Title 1：**Big Data Open Platform**
Chair：
Prof. Bilong Wen , Northeast Petroleum University, China

Title 2：**How to Embrace Big Data in Finance to Be Successful**
Chair：
Prof. Guang Sun , Hunan University of Finance and Economics , China

Title 3：**Research on the Application of Big Data and Artificial Intelligence Technology in Intelligent Agriculture and Other Fields**
Chair：
Prof. Jiamin Wang, Shandong Institute of Commerce and Technology, China

Title 4：**Big Data and Computer Vision for Intelligence Agriculture**
Chair：
Prof. Bin Liu, Northwest A&F University, China

Title 5：**Big Data Analytics for Intelligent Transportation and Business Intelligence**
Chair：
Prof. Zhijun Chen, Intelligent Transportation Systems Research Center, Wuhan University of Technology, China
Prof. Yishi Zhang, School of Management, Wuhan University of Technology, China

2. Artificial Intelligence Algorithms, Models and Applications

Title 6：**Recent Advances in Artificial Intelligence with Applications**
Chair：
Prof. Youfa Liu, Huazhong agricultural university, China

Title 7：**Special Issue on Natural Language Processing for Low-Resource Languages**
Chair：
Prof. Shaolin Zhu, Zhengzhou University of Light Industry, China
Prof. Chenggang Mi, Northwestern Polytechnical University, China

3.Internet of Things

Title 8：Security and Energy Efficiency for the Internet of Things
Chair：
Prof. Chao Meng   Jinling Institute of Technology, China

Title 9：Experience Enhanced Intelligence to IoT
Chair：
Prof. Haoxi Zhang , Chengdu University of Information Technology , China

4. Image processing and computer vision

Title 10：Computer Vision under Few Shot Learning
Chair：
Prof. Duanbing Chen, University of Electronic Science and Technology of China, China

Title 11：Intelligent Image Processing and Recognition
Chair：
Prof. Huimin Lu, Changchun University of Technology, China

Title 12：Artificial Intelligence for Medical Image Computing and Digital Medicine
Chair：
Prof. Yudan Ren, Northwest University, China

Title 13：Computer Vision for Intelligent Scene Perception
Chair：
Prof. Zhigang Liu, Northeast Petroleum University, China
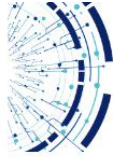
5. Bioinformatics

Title 14：Advanced Bioinformatics: Computational Methods for Knowledge Discovery Based on Multi-Omics
Chair：
Prof. Tao Wang , Northwestern Polytechnical University, China

6. IntelligentComputingTechnology

Title 15：Intelligent Manufacturing and Application
Chair：
Prof. Ying Yang   Guangxi University, China

Title 16：Mobile Crowdsensing and Applications
Chair：
Prof. Mingjun Xiao , University of Science and Technology of China, China
Prof. Guoju Gao , Soochow University, China

Title 17：Few-Shot Learning Research and Application
Chair：
Prof. Baodi Liu, China University Of Petroleum, China

Title 18：Challenges and Opportunities in Cloud Computing and Edge Computing
Chair：
Prof. Gongming Zhao, University of Science and Technology of China, China

Title 19：Applications of knowledge representation and deep learning
Chair：
Prof. Chunwei Tian, Northwestern Polytechnical University, China
Prof. Chengyuan Zhang, Hunan University, China
Prof. Huawen Liu, Zhejiang Normal University, China
Dr. Qi Zhang, Harbin Institute of Technology, China
Prof.. Xu Liang, Harbin Institute of Technology, China

Keynote Speakers

Speaker 1: Prof. Laurence T. Yang
Department of Computer Science
St Francis Xavier University, Canada

Title: Cyber-Physical-Social Systems: System Design and Data Analytics

Abstract

The booming growth and rapid development in embedded systems, wireless communications, sensing techniques and emerging support for cloud computing and social networks have enabled researchers and practitioners to create a wide variety of Cyber-Physical-Social Systems (CPSS) that reason intelligently, act autonomously, and respond to the users' needs in a context and situation-aware manner. The CPSS are the integration of computation, communication and control with the physical world, human knowledge and sociocultural elements. It is a novel emerging computing paradigm and has attracted wide concerns from both industry and academia in recent years.

Currently, CPSS are still in their infancy stage. Our first ongoing research is to study effective and efficient approaches for CPSS modeling and general system design automation methods, as well as methods analyzing and/or improving their power and energy, security, trust and reliability features. Once the CPSS have been designed, they collect massive data (Volume) from the physical world by various physical perception devices (Variety) in structured/semi-structured/unstructured format and respond the users' requirements immediately (Velocity) and provide the proactive services (Veracity) for them in physical space or social space. These collected big data are normally high dimensional, redundant and noisy, and many beyond the processing capacity of the computer systems. Our second ongoing research is focused on the Big Data-as-a-Service framework, which includes data representation, dimensionality reduction, incremental and distributed processing, security and privacy, deep learning, clustering, prediction and proactive services, aiming at representing and processing big data generated from CPSS, providing more valued smart services for human and refining the previously designed CPSS.

This talk will present our latest research on these two directions. Corresponding case studies in some applications such as smart traffics will be shown to demonstrate the feasibility and flexibility of the proposed system design methodology and analytic framework.
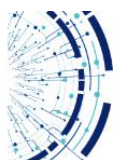
Biography

Laurence T. Yang got his BE in Computer Science and Technology and BSc in Applied Physics both from Tsinghua University, China and Ph.D in Computer Science from University of Victoria, Canada. He is a professor in Hainan University, China as well as a professor and W.F. James Research Chair at St. Francis Xavier University, Canada. His research includes Cyber-Physical-Social System Design and Data Analytics. He has published 250+ papers in the above areas on top IEEE/ACM Transactions/Journals with total citations of 27893 and H-index of 82 including 7 and 28 papers as top 0.1% and top 1% highly-cited ESI papers, respectively.

He has been involved actively act as a steering chair for 10+ IEEE international conferences. He is the chair of IEEE CS Technical Committee of Scalable Computing (2008-2011, 2018-), the co-chair of IEEE SMC Technical Committee on Cybermatics (2016-), the co-chair of IEEE SC Hype-Intelligence Technical Committee (2021-), and the chair IEEE CIS Cyber-Physical-Social Systems Task Force (2019-) and the vice-chair of IEEE CIS Technical Committee on Smart World (2016-2019). In addition, he is serving as an editor for many international journals and is an author/co-author or an editor/co-editor of more than 25 books from well-known publishers, invited to give around 50 keynote talks at various international conferences and symposia.

His recent honors and awards include the member of Academia Europaea, the Academy of Europe (2021), the John B. Stirling Medal (2021) from Engineering Institute of Canada, IEEE Sensor Council Technical Achievement Award (2020), IEEE Canada C. C. Gotlieb Computer Medal (2020), ACM Distinguished Scientist (2020), Clarivate Analytics (Web of Science Group) Highly Cited Researcher (2019, 2020), Fellow of Institution of Engineering and Technology (2020), Fellow of Institute of Electrical and Electronics Engineers (2020), IEEE TCCPS Most Influential Paper Award on Cyber-Physical Systems (2020), IEEE SCSTC Most Influential Paper Award on Smart Computing (2019), IEEE TCBD Best Journal Paper Award on Big Data (2019), Fellow of Engineering Institute of Canada (2019), AMiner Most Influential Scholar Award for Internet of Things (2018), IEEE TCCPS Distinguished Leadership Award on Cyber-Physical Systems (2018), IEEE SCSTC Life-Career Achievement Award on Smart Computing (2018), Fellow of Canadian Academy of Engineering (2017), IEEE System Journal Best Paper Award (2017), IEEE TCSC Award for Excellence in Scalable Computing (2017), Elsevier JCSS Elsevier JCSS Journal Most Cited Paper Award (2017) and the PROSE Award on Engineering and Technology (2010).

Speaker 2: Prof. Chi Liu

The winner of National Excellent Youth Science Fund of China
Beijing Institute of Technology, China

**Title: unattended marginal group intelligence**

Abstract
Nattended marginal group intelligence technology use sensors that are carried by multiple unmanned mobile platforms such as autonomous vehicle, unmanned aerial vehicle, unmanned boats, unmanned ships to collect big data of Internet of things, which play an important role in smart city, emergency disaster relief, and military combat. Different from traditional solutions based on optimization theory or game theory, this report aims to discuss how to utilize deep reinforcement learning and characteristics of spatio-temporal data extraction technology to schedule data acquisition of multiple unmanned platforms and edge computing optimization technology oriented to big data machine learning and privacy protection.

Biography

Chi Liu works as a professor, doctoral supervisor, and the vice-president at School of Computer Science & Technology of Beijing Institute of Technology. Additionally, he was selected as the winner of National Excellent Youth Science Fund of China, IET fellow, BCS fellow, and CIE fellow. He received his bachelor degree at Tsinghua University and his doctorate at Imperial College London. He served as a research director of IBM T.J. Waston Research Center and IBM Research - China and a postdoctoral researcher at Deutsche Telekom AG Research Institute. His research area includes intelligent internet of things technology. He is a member of expert advisory Group of the 14th Five-Year Plan of National Information Industry of China, member of editorial board of IEEE Transactions on Network Science and Engineering and Acta Electronica Sinica. Besides, he was the silver medal winner of Best Paper Runner-up Award in KDD'21 and won 1 first prize, 2 second prizes and 3 third prizes, which all were at provincial level/ ministry level.
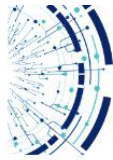
Speaker 3: Prof.Philippe Fournier-Viger

Title: Algorithms to discover interesting patterns to improve the design of intelligent systems

Abstract

Today, intelligent systems play an important role in various domains such as for factory automation, education, the management of telecommunication networks and medical care. To build intelligent systems, high-quality data is generally required. Moreover, these systems can also yield large amounts of data such usage logs, alarm logs, images, videos, and data collected from sensors, and data received from other systems. Due to the large volumes of data, managing the data generated by intelligent systems to gain insights and improve these systems is thus a key challenge. It is also desirable to be able to extract information or models from data that are easily understandable by humans. Based on these objectives, this talk will discuss the use of data mining algorithms for discovering interesting and useful patterns in symbolic data generated from intelligent systems. The talk will first briefly review early study on designing algorithms for identifying frequent patterns can be used for instance to identify frequent alarms or faults in telecommunication networks. Then, an overview of recent challenges and advances will be presented to identify other types of interesting patterns in more complex data. Topics that will be discussed include high utility patterns, locally interesting patterns, and periodic patterns. Lastly, the SPMF open-source software will be mentioned and opportunities related to the combination of pattern mining algorithms with traditional artificial intelligence techniques for intelligent systems will be discussed.

Biography

Philippe Fournier-Viger (Ph.D) is a Canadian researcher, distinguished professor at the Shenzhen University (China). Five years after completing his Ph.D., he came to China and became full professor at the Harbin Institute of Technology (Shenzhen), after obtaining a title of national talent from the National Science Foundation of China. He has published more than 330 research papers related to data mining, intelligent systems and applications, which have received more than 8400 citations (H-Index 46). He is associate editor-in-chief of the Applied Intelligence journal (SCI, Q1) and editor-in-chief of Data Science and Pattern Recognition. He is the founder of the popular SPMF data mining library, offering more than 200 algorithms, cited in more than 1,000 research papers. He is a co-founder of the UDML and MLiSE series workshop at the ICDM, PKDD and KDD conferences. His interests are data mining, algorithm design, pattern mining, sequence mining, big data, and applications.

Speaker 4: Prof. Guang Sun

Institute of Financial Big Data, School of Information Technology and Management
Hunan University of Finance and Economics, Changsha City, Hunan Province, China

Title: A Paradigm Shift from Big Data to Small and Wide Data

Abstract
Research firm Gartner says 70% of organizations will shift their focus from big to small and wide data by 2025. Definitely, this is a big paradigm shift. As we have been experiencing the limitations of big data as a critical factor of analytics and AI, new data-oriented approaches are very expected.

This talk will brief provide an introduction to and overview of why is small and wide data important? 一that is, analytics and AI need to work with more recent and less voluminous data, whereas collecting sufficiently large volumes of historical or labelled data for analytics and AI is a challenge for many organizations. Even if big data is available, the costs, time and energy to implement conventional supervised ML can still be prohibitive. This means that there's a indispensable growing need for analytical techniques that can leverage available data more effectively, either by reducing the required volume or by extracting more value from unstructured, diverse data sources.

At the end of this talk, I present our first step to small and wide data application. Graph analysis can be done at scale by using Spark GraphX which loading data into memory and running graph analysis in parallel. In this way, we should take data out of graph databases and put it into memory. Considering the limitation of memory size, the premise of accelerating graph analytical process reduces the graph data to a suitable size without too much loss of similarity to the original graph. We use SEQUITUR data compression algorithm to find out hot code path and store it as a whole paths directed acyclic graph. Hot code path is inherent regularity of a program. About 10 to 200 hot code path account for 40%-99% of a program's execution cost. These hot paths are acyclic contribute more than 0.1%-1.0% of some execution metric. We expand hot code path to a suitable size which is good for runtime and keeps similarity to the original graph. Obviously, hot code path is small data, and expand hot code path is wide data indeed.
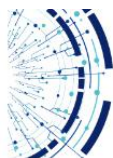
Biography

Dr. Guang SUN is currently a Full Professor with the Institute of Financial Big Data, School of Information Technology and Management, Hunan University of Finance and Economics. His current research interests include Practical Big Data in Finance, Deep Learning, Software Watermarking, Software Birthmarking and Dependable Software. He has published over 50 SCI-indexed journal papers (including over 10 ranked JCR-1 papers) and 50 EI indexed refereed conference papers related to these research areas. He is a associate dean of School of Information Technology and Management, dean of Institute of Financial Big Data. He currently serves as the Director of National Information Technology Standardization Technical Committee.

Conference Schedule

| Nov 13,, 2021 (Saturday, A.M.)	ICCBDAI 2021
8:00-11:20	**Keynote Speeches**
8:00-8:20	**Admission**
8:20-8:30	**Opening Ceremony** **ICCBDAI General Chair: Kehua Guo** **Central South University, China**
8:30-9:10	**Distinguished Talk 1: Cyber-Physical-Social Systems: System Design and Data Analytics** *Prof. Laurence T. Yang*, St Francis Xavier University, Canada
9:10-9:20	**Photograph**
9:20-10:00	**Distinguished Talk 2: Unattended marginal group intelligence** *Prof. Chi Liu*, Beijing Institute of Technology, China
10:00-10:40	**Distinguished Talk 3:Algorithms to discover interesting patterns to improve the design of intelligent systems** *Prof. Philippe Fournier-Viger*, Shenzhen University, China
10:40-11:20	**Distinguished Talk 4: A Paradigm Shift from Big Data to Small and Wide Data** *Prof. Guang Sun*, Hunan University of Finance and Economics, China

ICCBDAI2021 Conference Schedule of Workshops

(24 Papers, 10 Minutes Presentation / Paper)		
Nov 13, 2021 (Saturday，P.M.)	**ICCBDAI2021**	
Time	**Title**	**Speaker**
14:00-14:10	1.Incremental Server Deployment for NFV-Enabled Software Defined Networks (University of Science and Technology of China)	Xingpeng Fan
14:10-14:20	2. Teacher-Student Based Domain Adaptation for Person Re-identification (University of Electronic Science and Technology of China)	Jianpeng Ding
14:20-14:30	3. Performance analysis of SWIPT system with imperfect channel state information （Jinling Institute of Technology）	Chenxi Zhang
14:30-14:40	4.Intelligent LoRa NoC Applied in the Environmental Protection for Mu Us Desert （Xi'an Polytechnic University）	Lu Liu
14:40-14:50	5. A Light Model for Super-Resolution of Remote Sensing Images （University of Electronic Science and Technology of China）	Tingting Song
14:50-15:00	6. Intelligent logistics scheduling model based on Q-learning （Guangxi University）	Min Feng
15:00-15:10	7. Semi-supervised LDA and multi-distance metric learning for person re-identification （Wuhan Polytechnic University）	Bin Li
15:10-15:20	8.Road Aerial Object Detection Based On Improved YOLOv5 （Guangxi University）	Zhenzhe Li
15:20-15:30	9.Attention based data augmentation for knowledge distillation with few data （University of Electronic Science and Technology of China）	Shengzhao Tian
15:30-15:40	10.Exploration and practice of P2G teaching mode of big data architecture and mode experiment （Huazhong Agricultural University）	Qian Liu
15:40-15:50	11.A serial attention frame for multi-label waste bottle classification （Central South University）	Jingyu Xiao

| 15:50-16:00	12.Attention-base CNNs for image classification: A Survey （Northwestern Polytechnic University）	Jian Li
16:00-16:10	13.Recent Graph Neural Networks:A Survey （Huazhong Agricultural University）	Jiawei Zhang
16:10-16:20	14.Multi-contrast MRI Reconstruction via Multi-scale Patched-based Cross-contrast Channel Selection （Harbin Institute of Technology, Shenzhen）	Zehua Yang
16:20-16:30	15.Deep CNNs for image denoising （Northwestern Polytechnic University）	Chunwei Tian
16:30-16:40	16.A New Target Detection Model more Suitable for Embedded Devices （Changchun University of Technology）	Songzhe Ma
16:40-16:50	17.Intelligent Scheduling System For Production Line Automatic Matching Based on DSSM-XGBoost （Guangxi University）	Shuaihu Yang
16:50-17:00	18.Research on optimization of government decision-making by random dominance model supported by big date （Hunan University of Finance and Economics）	Jinrui Wu
17:00-17:10	19.A Novel Brain Tumor Segmentation Method Based on Improved Spatial Attention Mechanism and Multi-path Deep Neural Network （Changchun University of Technology）	Guizeng Wang
17:10-17:20	20.Using Graveyard Model and Big Data to Analyze Chinese bubble tea Brands （International Department of Yale High School）	Junqi Sun
17:20-17:30	21. Useing FA-NAR dynamic neural network model and big data to monitor dam safety （Hunan University of Finance and Economics）	Zhitong Quan
17:30-17:40	22. Extracting parallel sentences from low-resource language pairs with minimal supervision （Zhengzhou University of Light Industry）	Zhenlin Xia
17:40-17:50	23. Reference Context Guided Vector to Achieve Multimodal Machine Translation （Zhengzhou University of Light Industry）	Pei Cheng
17:50-18:00	24. Large-Scale Plant Species Real-Time Identification Method by Leveraging Plant Taxonomy Guided Increasing Hierarchical Orthogonal Loss （Northwest A&F University）	Jiaqi Zhang
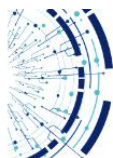
Nov 14, 2021 (Sunday)	ICCBDAI2021
08:30-18:00	**Conference Trip**
	Free tour
	Have a great trip home! See you in ICCBDAI 2022!
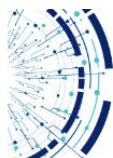
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International Conference on Computer, Big Data and Artificial Intelligence

Conference affairs and cooperation

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Meeting Minutes