ICCBDAI2020

International Conference on Computer Big Data and Artificial Intelligence

Oct. 24-25, 2020

ICCBDAI 2020

International Conference on Computer Big Data and Artificial Intelligence

24-25 October 2020 in Changsha

Conference Program

Co-Sponsored by











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Welcome Letter

ICCBDAI 2020 is to bring together innovative academics and related experts in the fields of Artificial Intelligence and Big Data to a common forum. The primary goal of the conference is to promote researches and developmental activities in Artificial Intelligence and Big Data and the other goal is to promote scientific information interchange between researchers, developers, engineers, students and practitioners working all around the world. ICCBDAI 2020 heart-felt thank to the keynote speakers and workshops for your efforts. The organizing committee is excited to invite you to take part in ICCBDAI 2020 to discuss issues at the technological frontier of society today as well as interdisciplinary technological trends.

Wish you a fruitful and joyful conference!



Committee

General Chairs

Prof. Wangdong Yang Hunan University, China Prof. Kehua Guo Central South University, China Prof. Yujuan Quan Jinan University, China Prof. Bin Deng Queen Mary University of London, UK Prof. Hui Yang National University of Defense Technology, China

Technical Program Chairs

Prof. Dong Cao Guangzhou University of Chinese Medicine, China Prof. Han Long National University of Defense Technology, China Prof. Rongyuan Chen Hunan University of Technology and Business, China Prof. Bingxiang Liu Jingdezhen Ceramic Institute, China Prof. Buwen Cao Hunan City University, China Prof. Zhufang Kuang Central South University of Forestry and Technology, China Prof. Guang Sun Hunan University of Finance and Economic, China Prof. Aibin Chen Central South University of Forestry and Technology, China Prof. Fenhua Cheng Hunan University of Science and Engineering, China Prof. Jin Zhang Hunan Normal University, China Prof. Yancong Su



Xiamen University of Technology, China Dr. Panpan Li National University of Defense Technology, China

Publication Chairs

Prof. Deyu Zhang, Central South University, China Dr. Aiping Zhao, Central South University, China Dr. MingWu, Huazhong University of Science and Technology, China

Organization Committee Members

Prof. Hao Li, Echnische Universiteit Delft, Holland Prof. B.Xie, Carnegie Mellon University, USA Prof. Kehua Guo, Central South University, China Prof. Srikanta Patnaik, SOA University, India Prof. HanLong, National University of Defense Technology, China Prof. Wangdong Yang, Hunan University, China Prof. Maru Samaila, Federal University of Technology, Nigeria Prof. Mei niang Fan, National Central University, Taiwan Prof. Huaping Liu, Tsinghua University, China Prof. DongCao, Guangzhou University of Chinese Medicine, China Prof. Minglei Song, Henan University of Urban Construction, China Prof. Danny Wang, University of Cassino and South Latium, Italy Prof. Mingqi Sun, Harbin University of Science and Technology, China Prof. Chong Shen, Hainan University, China Prof. Bin Deng, Queen Mary University of London, UK Prof. Yangyong Sun, Guandong Academy of Building Research, China Prof. Zhongli Shen, Changsha University of Science and Technology, China Prof. Yujuan Quan, Jinan University, China Prof. Hui Yang, National University of Defense Technology, China Prof. Samaila Umaru, HmaduBello University, Nigeria Prof. Chengcheng Yao, The Ohio state University, USA Prof. Feng Hou, University of illinois at urbana-champaign, USA Prof. JieShi, Guangdong Pharmaceutical University, China Prof. Xiaochun Tang, Northwestern Polytechnical University, China Prof. Buwen Cao, Hunan City University , China Prof. Rongqun Hu, Nanchang Institute of Technology, China Prof. Yilai Zhang, Jingdezhen Ceramic Institute, China Prof. Bingxiang Liu, Jingdezhen Ceramic Institute, China Prof. Liang Ma, Anhui University of Technology, China Prof. Leian Liu, Zhongkai University of Agriculture and Engineering, China Prof. Srikanta Patnaik, SOA University, Bhubaneswar, India



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Prof. Ranjan Kumar Mallick, SOA University, Bhubaneswar, India Prof. Hamilton Ostum, University of Arizona Tucson, USA Prof. Donovan Young, Marshall University, Canada Prof. Yenny Mariawati, Florida State University, USA Prof. Antonio Prata. University of the West of England, UK Prof. JiayinGan, HainanMedical University, China Prof. Danny Wang, University of Cassino and South Latium, Italy Prof. Rongyuan Yang, Hunan University of Technology Business, China Prof. Chengqiu Dai, Hunan Institute of Technology, China Prof. Junshan Tan, Central South University of Forestry and Technology, China Prof. Chengcheng Yao, The Ohio state University, USA Prof. Quanli Wang, Central South University of Forestry and Technology, China Prof. Weijie Kuai, Guangdong Polytechnic Normal University, China Prof. Biwu Xiao, Central South University of Forestry and Technology, China Prof. Zhang Yang, Fujian University of Technology, China Dr. Aiping Zhao, Central South University, China Dr. MingWu, Huazhong University of science and technology, China Dr Yan Xie, Central South University, China Dr. Zhirong Wu, Hunan University of Science and Technology, China Dr. Ruilin Zhou, Hunan Institute of Technology, China Prof. Buwen Cao, Hunan City University, China Prof. Zhufang Kuang, Central South University of Forestry and Technology, China Prof. Guang Sun, Hunan University of Finance and Economic, China Dr. Jun Ye, School of Computer Science and Cyberspace Security, Hainan University, China Dr. Jiamin Wang, Shandong University, China Dr. Liu Ming, Beihang University, China Dr. Hongyue Yuan, Zhengzhou University, China Dr. Xing Jun, Qingdao Huanghai University, China Dr. Luo Fei, Huazhong University of Science and Technology, China Dr. Li Chunguo, Southeast University, China Dr. Guangyin Jin, National University of Defense Technology, China Dr. Chenxi Liu, Hunan University, China Prof. Kunrong Hu, Southwest Forestry University, China Prof. Yongke Sun, Southwest Forestry University, China Prof. Youjie Zhao, Yangzhou University, China Prof. Yong Cao, Southwest Forestry University, China Dr. Zhengyu Zhu , Zhengzhou University, China Prof. Weiwu Ren ,Jilin University, China Prof. Jin Zhang, Hunan Normal University, China Prof. Yancong Su, Xiamen University of Technology, China Dr. Zhongyi Zhai, Guilin University of Electronic Technology, China



Workshops

1. Artificial Intelligence Algorithms, Models and Applications

Title 1 : Multi-agent Deep Reinforcement Learning in Games Chairs: Han Long, National University of Defense Technology, China Title 4: Artificial Intelligence, Big Data and Intelligent Agriculture, Intelligent Logistics Chair: Jiamin Wang, Shandong University, China Title 5: Machine Learning and Smart Agriculture Chair: Xuedou Yu, School of Information Management, Dezhou University, China Lianbing Zhou, Dongying Vocational Institute, China Guihua Liu, Weifang Medical College, China Title 7: Artificial Intelligence Algorithms and Applications in the Context of 5G and Big Data Chair: Jun Xin, Qingdao Huanghai University, China Fei Luo, East China University of Science and Technology, China Chunguo Li, Southeast university, China Title 8: Algorithms and Applications of AI Chair: Guangyin Jin, National University of Defense Technology, China Chenxi Liu, Hunan University, China Title 14: Deep Learning Methods and Applications in Image Understanding Chairs: Lin Li, Qingdao University, China Bin Jian, Qingdao University, China Title 18: Recent Advances of Machine Learning Research Chairs: Haoxi Zhang, Chengdu University of Information Technology, China Jian Luo, Wuhan Qing Chuan University, China 2. Big Data Technology and Application Title 2: Practical Big Data and Artificial Intelligence Chair: Guang Sun, School of Hunan University of Finance and Economics, China

Title 3: Data Mining and Big Data Analysis

Chairs:

Bingxiang Liu, School of Jingdezhen Ceramic University, China



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Title 10: Recommendation System and Cognitive Computing Chairs: Jing Wei Piao, Xiamen University of Technology, China Yin Jin, Xiamen University of Technology, China Yan Cong Su, Xiamen University of Technology, China Jian Xun Li, Xiamen University of Technology, China Title 17 : Big DataManagement and Analysis Models Building Chairs: Jun Ye, Hainan University, China Title 9: Security Big Data and Governance for Cyberspace Chairs: Kunrong Hu, Southwest Forestry University, China Yongke Sun, Southwest Forestry University, China Youjie Zhao, Yangzhou University, China Yong Cao, Southwest Forestry University, China

3. Internet of Things

Title 6: Smart IoT Sensing Chairs: Liu Ming, Beihang University, China Hongyue Yuan, Zhengzhou University, China Title 11: Intelligent Data Engineering for Society, Urban and Real-world Application Chairs: Rongruan Chen, Hunan University of Technology and Business, China Shaonian Huang, Hunan University of Technology and Business, China Title 13: Intelligent Communication Technologies and Cyberspace Governance in the Dynamics of Societal Systems Chairs: Deyu Zhang, Central South University, China Title 19: Application of Internet of Things and Artificial Intelligence in Agriculture Tonghai Liu, Tianjin Agricultural College, China Title 20: Internet of Things and Artificial Intelligence Jun Ye, Hainan University, China Title 21: Experience Enhanced Intelligence to IoT Haoxi Zhang, Chengdu University of Information Technology, Chengdu, China.

4. Intelligent Computing Technology

Title 12:Application of Intelligent Computing in EcologyChairs:Jin Zhang, Hunan Normal University, ChinaTitle 15:Intelligence and Software System



Chairs:

Guan Yang, Zhongyuan University of Technology, ChinaTitle 16: Emerging Trends of Energy and Spectrum Harvesting TechnologiesTonghai Liu, Tianjin University, China

Keynote Speakers

Title: CycLedger: A Scalable and Secure Parallel Protocol for Distributed Ledger via Sharding **Speaker:** Xiaotie Deng

Abstract: We present a scalable and secure parallel pro-tocol for distributed ledger via sharding. Our protocol selects a leader and a partial set for each committee, who are in charge of maintaining intra-shard consensus and communicating with other committees, to reduce the amortized complexity of communication, computation and storage on all nodes. We introduce a novel

semi-commitment scheme between committees and a recovery procedure to prevent the system from crashing even when leaders of committees are malicious. To add incentive for the network, we use the concept of reputation, which measures each node's trusty computing power. As nodes with a higher reputation receive more rewards, there is an encouragement for nodes with strong computing ability to work honestly to gain reputation. In this way,



we strike out a new path to establish scalability, security and incentive for the shardingb based distributed ledger.

Biography: Xiaotie Deng is chair professor of Center on Frontiers of Computing Studies, Peking University. Deng received his BSc from Tsinghua University, MSc from Chinese Academy of Sciences and PhD from Stanford University. He has taught at Shanghai Jiao Tong University of China, the University of Liverpool, City University of Hong Kong and York University. He was an NSERC international fellow at Simon Fraser University. Deng's current research focuses on algorithmic game theory with applications to Internet economics. His work covers algorithmic game theory, online algorithms, parallel algorithms and combinatorial optimization. He is an M.A.E., an ACM Fellow and an IEEE Fellow.

August 6th, 2020: The Academia Europaea, also known as the Academy of Europe, announces the results of the 2020 academician election. Professor Xiaotie Deng was elected as a foreign academician.



Title: Computer Architecture Technology for Intelligent Computing

Speaker : Yong Dou

Abstract: The report is composed of three parts as followed: In the first part, we will present the main development and design ideas of computer systems, along with the analyze on the current development trend of supercomputers. The second part will state the analyze on influence of artificial intelligence algorithms on the structure of computer systems and introduction on the working principles of typical artificial intelligence



accelerators, which is the highlight in the report. The last part will offers a prospect for the influence of the development of artificial intelligence algorithms on the structure of computer systems.

Biography: Yong Dou shoulders on teaching as professor in National University of Defense Technology, who obtained the National Outstanding Youth Funds. His mainly research focuses on parallel computer system structure and application. He was the leader or team member in over 10 studies of National Science Fund, National 863 Plan etc., and he won three ministry-level first prizes.

Title: AIoT: Learning in Cyberphysical Systems

Speaker: Nick Freris

Abstract: Cyberphysical Systems (CPS) encapsulate very large networks of "smart" devices (possessing sensing, communication, and computation capabilities) that control physical entities. Notable examples enlist Smart Cities, Smart Grids, Intelligent Transportation, Sensor Networks and Swarm Robotics. The ever-emerging paradigm of AIoT targets solutions that capitalize the computational power of Internet-of-Things (IoT) devices to enable Artificial Intelligence (AI) in system operations.

This keynote talk will comprise two parts:

In the first part, we will present two methods for real-time learning in CPS: a) Sparse Kernel Density Estimation (S-KDE), with application in online estimation of travel time densities in transportation systems, and b) Sparse Matrix Decomposition (S-MD), applied to online detection and localization of forced oscillations in smart grids.

The second part will highlight the fundamental balance between data transformation and data utility in machine learning. In Big Data applications, a key challenge lies in the fact that the data are hardly ever available in their original form, e.g., due to compression, rights protection, anonymization, dimensionality reduction or encryption. We will highlight methods for learning from inexact data with provable fidelity guarantees, in specific: a) Optimal distance estimation of compressed data series, b) Nearest Neighbor preserving watermarking, c) Cluster preserving compression, d) distance/correlation/rank-preserving data embedding, and e) Distributed consensus on encrypted data.



Biography: Nick Freris is Professor in the School of Computer Science at USTC, and Vice Dean of the International College. He received the Diploma in Electrical and Computer Engineering from the National Technical University of Athens (NTUA), Greece, in 2005, and the M.S. degree in Electrical and Computer Engineering, the M.S. degree in Mathematics, and the Ph.D. degree in Electrical and Computer Engineering all from the University of Illinois at Urbana-Champaign (UIUC) in 2007, 2008 and 2010, respectively.

His research lies in AIoT/CPS: machine learning, distributed optimization, data mining, wireless networks, control, and signal processing, with applications in power systems, sensor networks, transportation, cyber security and robotics. Dr. Freris has published several papers in high profile journals and conferences held by IEEE, ACM and SIAM. He holds three patents and two patent applications. His research was recognized with the National High-level Talent award, the USTC Alumni Foundation Innovation Scholar award, and the IBM High Value Patent award. Previously, he was



with the faculty of NYU and before that he was senior researcher at EPFL, and postdoctoral researcher at IBM Research. Dr. Freris is a Senior Member of ACM and IEEE, and a member of CCF and SIAM.

Title:High-Dimensional Tensor Heterogeneous Parallel Method and Technology for Artificial Intelligence

Speaker: Wangdong Yang

Abstract: Information dissemination has gradually transitioned from a single media form such as text, images, audio and video to a multi-media form that is integrated with each other, and it has become more and more cross-media. How to achieve cross-media analysis and reasoning has become a key issue in research and application. Tensor models a richer kind of data, which enables us to control the data of "multi relationship". These data have both spatial and temporal characteristics. Different directions in tensors represent different types of data. The tensor modeling is used to analyze and characterize the relationships between multiple aspects of data.

This keynote talk will comprise three parts: In the first part, we will present basic introduction and operation of tensor. In the second part, tensor decomposition based parallel computing technology will be included on the CPU-GPU heterogeneous platform. Finally, we will provide some Applications of tensor in artificial intelligence.

Biography:

Wangdong Yang received a Ph.D. degree in Computer Science and Technology from Hunan University. He worked as a professor in Hunan University. His research focuses on High-Performance Computing and Parallel Numerical Algorithms. He is a candidate of Hunan Province "121" talent plan.He has been designing and applying parallel algorithms on Tianhe





1, 2 and Sunway Taihu Light Supercomputers for a long time, and presided over the development of a series of basic numerical algorithm function libraries. He won the award ofscience and technology progress of Hunan Province. He has presided over more than 10 scientific research projects, including 2 general projects of National Natural Science Foundation of China, 2 national key R & D projects, 1 key R & D projects of Hunan Province and some enterprise projects. Published more than 30 papers in SCI / EI, including TC, TPDS, TKDD journals.

Contact Information

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Conference Schedule

Oct 24, 2020 (S	aturday, A.M.)	ICCBDAI 2020	
9:00-18:00	Registration	L Floor, Yannian Century Hotel (延年世纪酒店 L 楼)	
Oct 24, 2020 (Saturday)		ICCBDAI 2020	
8:00-12:00	Registration	L Floor, Yannian Century Hotel (延年世纪酒店 L 楼)	
Location	С	onference Center on 1th Floor (电梯下行至 1 楼中心会议厅)	
		Keynote Speaker Report	
08:30-08:40		Opening Ceremony ICCBDAI General Chair: <i>Wangdong Yan</i> g Hunan University, China	
08:40-08:50	Welcome Addressees		
	Kehua Guo, Central South University, China		
08:50-09:40	Distinguished Talk 1: CycLedger: A Scalable and Secure Parallel Protocol for Distributed Ledger via Sharding <i>Prof.</i> Xiaotie Deng, Chair Professor of Center on Frontiers of Computing Studies, Peking University, Chinese		
09:40-10:20	Distinguished Ta <i>Prof</i> .	lk 2: Computer Architecture Technology for Intelligent Computing Yong Dou, National University of Defense Technology, Chinese	
10:20-10:40		Coffee Break; Group Photo forParticipants	
10:40-11:20	Distinguished Talk 3: AIoT: Learning in Cyberphysical Systems <i>Prof.</i> Nick Freris,University of science and technology of China, Athenian		
11:20-12:00	Distinguished T Technology for Ar <i>Prof. W</i>	Calk 4: High-Dimensional Tensor Heterogeneous Parallel Method and rtificial Intelligence Cangdong Yang, Hunan University,Chinese	
12:00-13:30		Lunch Break on L Floor (L 楼自助餐厅)	



Conference Schedule

Oct 24, 2020) (Saturday, P.M.)		ICCBDAI 2020
	Parallel Sessions		
Location	1 st Multi-function hall (1 楼多功能会议厅)	5 nd Small Meeting Room 1 (5 楼小会议室)	
14:00-15:40	Session 1: AI	14:00 16:30	Session 3: Internet of
15:55-17:40	Session 2: Big Data	14:00-10:30	Things&Other
18:00-20:00	Banquet on 2F, Shiruyi Restaurant (2 楼食如意中餐厅)		
	Chair: Wang dong Yang, Hunan University, China		

Conference Schedule for Parallel Sessions

Oct 24, 2020 (Saturday, P.M.)	ICCBDAI 2020
Location	1 st Multi-function Hall (1 楼多功能会议厅)	
	Session 1: A I (10 Papers, 10Minutes Presentation / Paper) Session Chair: Han Long, National University of Defense Technology, Ch	ina
Time	Title	Speaker
14:00-14:10	1.Multi-agent Deep Reinforcement Learning in Games	Han Long
14:10-14:20	2.Interpretable Saliency Map for Deep Reinforcement Learning	Hong Zheng
14:20-14:30	3. Application Research of Artificial Intelligence in Intelligent Agriculture	Lianqin Jia
14:30-14:40	4.Research on Rapeseed Counting Based on Machine Vision	Shunzheng Peng
14:40-14:50	5.Improved Algorithm Based on the Deep Integration of GoogleNet and Residual Neural Network	Xuehua Huang
14:50-15:00	6.Similarity Graph Learning and Non-linear Deep Representations for Spectral Clustering	Yi Li
15:00-15:10	7.A Thematic Portfolio and Recommended Study on the Usefulness of	Yonghong Wang



	Online Medical Reviews Based on QCA Methods	
15:10-15:20	8. An Efficient Methodology for License Plate Localization and Recognition	Sainan Xiao
15:20-15:30	9. A Novel Evaluation of Artificial Neural Network Model	Sen Tian
15:30-15:40	10.Vehicle Object Detection Based on Improved RetinaNet	Luyang Zhang
15:40-15:55	Coffee Break	
	Session 2: Big Data (9 Papers, 10 Minutes Presentation / Paper)	
	Session Chair: Guang Sun, Hunan University of Finance and Economic, Chir	na.
15:55-16:05	11. Multi-Angle Movie Reviews Analysis Based on Multi Model	Yanzhe Liu
16:05-16:15	12. Construction of Medical Knowledge Graph for Stroke	Binjie Cheng
16:15-16:25	13. Multi-source Data-driven Visual Analysis of Urban Crowd Travel Patterns	Jianzhong Zhang
16:25-16:35	14. Review of Rational Drug Use Based on Apriori Algorithm	Zhangming Luo
16:35-16:45	15. Systematic Data Visualization Analysis for Securities Investment Fund Selection	Guang Sun
16:45-16:55	16. A Recommendation Approach Based on Graph Neural Network	Hangjun Zhou
16:55-17:05	17. AMOS-based Analysis of Factors Influencing Customer Loyalty	Qinying Zhu
17:05-17:15	18. Application of Data Classification Method Based on Non-negative Matrix Factorization	Lingjiao Li
17:15-17:25	19. Media Coverage, CEO Age and Corporate Performance in Big Data Environment	Yun Song
17:25-17:40	Best Paper Award(Part 2)	

Session 3: Internet of Things&Other (9 Papers, 10 Minutes Presentation / Paper)			
	Session Chair: Jin Zhang, Hunan Normal University, China.		
Oct 24, 2020 (Saturday, P.M) ICCBDAI 2020			
Location	5 nd Small Meeting Room l, Up to 5F(电梯上行至 5 楼小会	;议室)	
Time	Title	Speaker	
14:00-14:10	1.Key Technologies and Applications of Wild Animal Stellite Tracking	Tian Huang	



14:10-14:20	2.Experience Enhanced Intelligence to IoT	Haoxi Zhang
14:20-14:30	3.Eearchable Encryption in Multi-user Settings	Jun Ye
14:30-14:40	4.A New Crowd Counting and Detection Framework Based on Improved Density Map	Sheng Chen
14:40-14:50	5.Improve SSD's Mask Wearing Detection Algorithm	Houkang Deng
14:50-15:00	6.Design and Implementation of Regional Online Ride-hailing Scheduling Algorithm	Anding Hong
15:00-15:20	Coffee Break	
15:20-15:30	7.A Virtual Simulation Experiment System for Requirement Analysis	Yuyi Peng
15:30-15:40	8.An Energy-optimized Algorithm for the Data Packet Transmission with Circuit Power Consumption	Zihan Zhang
	1 	
15:40-15:50	9.Data Correlation Based Feature Selection Model for Children's Growth and Development Assessment	Changhua Zhao

Oct 25, 2020	(Sunday)	ICCBDAI 2020
	Conference Trip	
08:30-16:30	Free tour	
	Have a great trip home! See you in ICCBDAI 2021!	



Conference Venue

延年世纪酒店

Yannian Century Hotel

湖南省长沙市开福区三一路与车站北路交汇处

Intersection of Sanyi Road and Station North Road, Kaifu District,

Changsha, China





Hotel Distribution Map

酒店平面分布图





Meeting Minutes

