

CONFERENCE ABSTRACT

ICMIP 2020

2020 5th International Conference on Multimedia
and Image Processing

ICCSP 2020

2020 4th International Conference on Cryptography,
Security and Privacy

January 10-12, 2020 | 南大国际会议中心

Nanjing University International Conference Center 163 Xianlin Avenue, Nanjing, China

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Welcoming Address

On behalf of the conference committees, we are pleased to welcome you to ICMIP 2020-*5th International Conference on Multimedia and Image Processing* and ICCSP 2020-*4th International Conference on Cryptography, Security and Privacy*, which will be jointly held during January 10-12, 2020, in Nanjing, co-sponsored by Nanjing University, China.

The objective of ICMIP & ICCSP is to present the latest research and results of scientists related to multimedia and image processing, cryptography, security and privacy topics. It provides opportunities for the different areas delegates to exchange new ideas and application experiences face to face, to establish business or research relations and to find global partners for future collaboration. We hope that the conference results constitute significant contribution to the knowledge in these up to date scientific field.

2020 Nanjing Conferences will be composed of 6 oral parallel sessions, 1 poster session, 4 keynote speeches delivered respectively by *Prof. Ce Zhu, IEEE and IET Fellow, University of Electronic Science and Technology of China, China, Prof. Min-Ling Zhang, Southeast University, China, Prof. Abderrahim Benslimane, Avignon University, France, Prof. Shuangbao Wang, Morgan State University, USA, and 1 invited speech donated by Dr. Chau Kien Tsong, Universiti Sains Malaysia, Malaysia.*

We'd like to express our sincere gratitude to everyone who has contributed to ICMIP & ICCSP 2020 as its success could have only been achieved through a team effort. Additionally, our special thanks go to all the conference speakers for their insightful and contemporary thought leadership on many emerging research topics. We would also like to especially thank the conference chairs, the program chairs and the session chairs, for putting the conference together; as well as to all the technical committee members and reviewers for their excellent work in reviewing the papers and their other academic support efforts. Finally, we are particularly grateful to all the authors and presenters of the papers as well as all the attendees for their contributions to this wonderful conference.

Hope you will enjoy the conference, the food, the hospitality, and the beautiful and charming environment of Nanjing!

**ICMIP & ICCSP 2020
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Instructions

◆ Onsite Safety

Please wear your delegate badge for all the conference activities. Lending your participant card to others is not allowed. Please take good care of your valuables at any time during the conference. The conference organizer does not assume any responsibility for the loss of personal belongings of the participants.

◆ Registration Guide

Inform the Conference Staff of Your Paper ID → Sign Your Name on the Participants List → Collect Your Conference Kits.

◆ Devices Provided by the Conference Organizers

Laptops (with MS-Office & Adobe Reader)
Projectors & Screen
Laser Sticks

◆ Materials Provided by the Presenters

PowerPoint or PDF files.
Please copy your slide files to the conference laptop before session starts.

◆ Duration of Presentation

Oral Session: 15 minutes apiece including Q&A

◆ Dress Code

Business Attire / Semiformal / Business Casual / National Formal Dress

◆ Notice

*Listener's Certificate can be collected along with your conference kits at the registration desk.

*Presenter's Certificate will be collected from the session chair after the session ends.

*A "Best Presentation" award will be selected from each session, and will be announced and awarded by the session chair at the end of each session.

◆ Contact Us

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Venue Map

NUICC 南大国际会议中心

Add: Nanjing University International Conference Center 163 Xianlin Avenue, Nanjing, PRC

(南京市仙林大道 163 号南大国际会议中心)

Tel: 025-89686666 (International dial 0086-25-89686666)

Official Web: <http://ndgjhyzx.com/en/index.asp>



 **NUICC**
Conference Venue

Meeting Agenda

2F	Zhongda Lecture Hall 中大报告厅 Rm. VIP202 励学厅 Rm. VIP203 恒学厅 Rm. VIP204 向学厅	1F	All-Day Restaurant (Buffet Lunch)
		3F	Rm. 302 (Chinese-style Banquets)

DAY 1 -- FRIDAY, JAN 10

10:00-17:00	Registration & Conference Kits Collection <NUICC Lobby>
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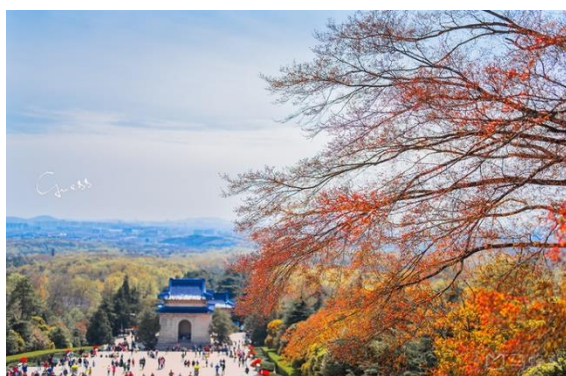
DAY 2 -- SATURDAY, JAN 11

KEYNOTE FORUM < Zhongda Lecture Hall >	
09:00-09:05	Welcome Address & Chair Person Prof. Wanyang Dai , Conference Chair, Nanjing University, China
09:05-09:45	Temporal dependency Based Bit Allocation for Rate Control in HEVC Prof. Ce Zhu , IEEE and IET Fellow, University of Electronic Science and Technology of China, China
09:45-10:25	Research on Partial Label Learning Prof. Min-Ling Zhang , Southeast University, China
COFFEE BREAK & GROUP PHOTO 10:25-10:50	
10:50-11:30	Internet of Things: Monitoring and Optimization Challenges for Security Issues Prof. Abderrahim Benslimane , Avignon University, France
11:30-12:10	Optimize Quantum Circuits for Fast Cryptanalyzing Pre and Post Quantum Cryptographies Prof. Shuangbao Wang , Morgan State University, USA
BUFFET LUNCH, All-Day Restaurant 1F 12:10-13:30	
PARALLEL PRESENTATION SESSIONS < VIP202, VIP203, VIP204 >	
13:30-15:35 VIP202	Invited Speech: Audio, Visual, and Tactile Integration in Digital Multimedia using Sensing Technologies Dr. Chau Kien Tsong , Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia, Malaysia
	Oral Session 1: Computer Vision and Image Processing Presentation: SP0025 SP003 SP0014 SP0021 SP0015 SP0023 SP0037
13:30-15:30 VIP203	Oral Session 2: Image Analysis and Calculation Presentation: SP0008 SP0009 SP0018 SP0006 SP0034 SP0032 SP0003 SP0035

13:30-15:30 VIP204	Oral Session 3: Computer Theory and Engineering Presentation: SP0028 SP0027 SP018 SP0039 SP008 SP026 SP005 SP017
13:30-15:30 2F	Poster Session: SP0024 SP007 SP009 SP014
COFFEE BREAK 15:30-16:00	
16:00-18:00 VIP202	Oral Session 4: Communication Network and Information System Presentation: SP001 SP002 SP011 SP025 SP0033 SP019 SP010 SP0031
16:00-18:00 VIP203	Oral Session 5: Data Encryption and Information Security Presentation: SP006 SP016 SP021 SP023 SP027 SP029 SP031 SP022
16:00-18:00 VIP204	Oral Session 6: Image Processing Technology and Method Presentation: SP0005 SP0029 SP0017 SP0010 SP0022 SP0011 SP0041 SP0019
CHINESE-STYLE BANQUETS, Rm. 302, 18:00-20:00	

DAY 3 -- SUNDAY, JAN 12

ONE-DAY TOUR IN NANJING	
09:00-17:00	<p>The Sun Yat-sen Mausoleum 中山陵 Presidential Palace of Nanjing 总统府 Fuzimiao (Confucius Temple) Qinhuai Scenic area 夫子庙-秦淮风光带 (Lunch and tickets included)</p>
<p>*Notice: Meeting Point: 08:50, NUICC Lobby Level 1. One-day Tour is optional & 80 USD/500 RMB apiece. Registration closes on 5 January 2020.</p>	



Introduction of Speakers



Prof. Ce Zhu, IEEE and IET Fellow, University of Electronic Science and Technology of China, China

Speech Title: Temporal dependency Based Bit Allocation for Rate Control in HEVC

Time: 09:05-09:45, JAN 11

ABSTRACT: Rate control is an indispensable module in practical video coding systems, which ensures the coded bit stream can meet channel bandwidth or storage space requirements. Most of the existing rate control methods compromise the rate distortion (RD) performance of encoders due to inappropriate bit allocations and inaccurate rate models. Inspired by our previous work on temporal-dependent RD optimization, this work presents a temporal dependency based optimal bit allocation at frame and coding tree unit (CTU) levels in rate control. Experimental results demonstrate that, on the HEVC test model (HM-16.7), the proposed methods achieve considerable RD improvement with a smaller deviation from a target bitrate, compared against the state-of-the-art schemes.

BIO: Ce Zhu is currently a Professor with the School of Information and Communication Engineering, University of Electronic Science and Technology of China, Chengdu, China, as a Changjiang Professor and the founding Director of Lab of Advanced Visual Communication & Computing. His research interests include image/video coding and communications, 3D video, visual analysis and understanding, visual perception and applications. He has served on the editorial boards of a few journals, including as an Associate Editor of IEEE Transactions on Image Processing, IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on Broadcasting, IEEE Signal Processing Letters, and IEEE Communications Surveys and Tutorials, as well as a Guest Editor of IEEE Journal of Selected Topics in Signal Processing. He is a Fellow of the IEEE, and an IEEE CASS Distinguished Lecturer (2019-2020).

He was with the School of Electrical & Electronic Engineering, Nanyang Technological University, Singapore, from 1998 to 2012. He also held visiting positions at Queen Mary, University of London (UK) in 2008, and Nagoya University (Japan) in 2011. Before that, he pursued postdoctoral research at the Chinese University of Hong Kong, Hong Kong, in 1995, City University of Hong Kong, Hong Kong, and the University of Melbourne, Australia, from 1996 to 1998. He received the B.S. degree from Sichuan University, Chengdu, China, in 1989, and the M.Eng and Ph.D. degrees from Southeast University, Nanjing, China, in 1992 and 1994, respectively, all in electronic and information engineering.....



Prof. Min-Ling Zhang, Southeast University, China

Speech Title: Research on Partial Label Learning

Time: 09:45-10:25, JAN 11

ABSTRACT: Partial label learning (PLL) is one of the important weakly-supervised learning frameworks. Under the partial label learning framework, each example is associated with multiple candidate labels among which only one is valid. Partial label learning techniques have been widely used in many scenarios including automatic multimedia content annotation, natural language processing, ecoinformatics, etc. In this talk, the state-of-the-art on partial label learning will be introduced from three aspects. Firstly, the problem setting of partial label learning and its relationships to other weakly-supervised learning frameworks are briefly discussed. Secondly, existing works as well as our recent progresses on designing partial label learning algorithms are summarized. Thirdly, related academic resources on partial label learning are given.

BIO: Min-Ling Zhang received the BSc, MSc, and PhD degrees in computer science from Nanjing University, China, in 2001, 2004 and 2007, respectively. Currently, he is a Professor at the School of Computer Science and Engineering, Southeast University, China. His main research interests include machine learning and data mining. In recent years, Dr. Zhang has served as the General Co-Chairs of ACML'18, Program Co-Chairs of PAKDD'19, ACML'17, CCFAI'17, PRICAI'16, Senior PC member or Area Chair of AAAI'19/'18, IJCAI'19/'18, ICDM'18/'17, etc. He is also on the editorial board of ACM Transactions on Intelligent Systems and Technology, Neural Networks, Science China Information Sciences, Frontiers of Computer Science, etc. Dr. Zhang is the secretary-general of the CAAI (Chinese Association of Artificial Intelligence) Machine Learning Society, standing committee member of the CCF (China Computer Federation) Artificial Intelligence & Pattern Recognition Society.



Prof. Abderrahim Benslimane, Avignon University, France

Speech Title: Internet of Things: Monitoring and Optimization Challenges for Security Issues

Time: 10:50-11:30, JAN 11

ABSTRACT: In Internet of Things (IoT), availability of devices, reliability of communication, Quality of Service (QoS), and security are all essential for the good functioning of applications. Over the time, the state of devices and the overall network may depreciate. This is due to the challenging and failure-prone nature of IoT; consisting of a huge number of heterogeneous and resource-constrained things in terms of memory, communication, energy and computational capabilities. Furthermore, energy constraints impose hard duty cycles to maximise longevity, which in turn causes unreliable connectivity. To ensure robustness, monitoring the network state, performance and functioning of the nodes and links is crucial, especially for critical applications. Safety-critical applications, such as a distributed fire- or burglar-alarm system, require that all sensor nodes are up and functional. Monitoring techniques for detecting, localizing and recovering network failures in IoT should be significantly developed. In this talk, we will first introduce the Internet of Things, its challenges and the monitoring concept. We will present the Research motivations and objectives for the monitoring. After presenting the state-of-the-art research on monitoring, we will present our theoretical solutions for monitoring IoT. We target the optimization of IoT network monitoring for fault tolerance, security and quality of service purposes.

BIO: Abderrahim Benslimane is Professor of Computer-Science at the Avignon University/France since 2001. He has been recently a Technical International Expert at the French Ministry of Foreign and European affairs (2012-2016). Currently, he is Chair of the ComSoc TC of Communication and Information Security. He is EiC of Inderscience Int. J. of Multimedia Intelligence and Security (IJMIS), Area Editor of IEEE IoT Journal, Area Editor of Wiley Security and Privacy journal and editorial member of IEEE Wireless Communication Magazine and Elsevier Ad Hoc. He is founder and serves as General-Chair of the IEEE WiMob since 2005 and of iCOST and MoWNet international conference since 2011. He served as a Symposium co-chair/leader in many IEEE international conferences such as ICC, Globecom, AINA and VTC. His research interests are in development of communication protocols with the use of graph theory for mobile and wireless networks. Currently, he is working on the conception and performance evaluation of protocols for security in Internet of Things. Also, he works on multicast routing, inter-vehicular communications, Quality of service, energy conservation, localization, intrusion detection and MAC layer performance evaluation.

More info about his activities and all his publications can be found via the following URL.
<http://abderrahimbenslimane.org/>



Prof. Shuangbao Wang, Morgan State University, USA

Speech Title: Optimize Quantum Circuits for Fast Cryptanalyzing Pre and Post Quantum Cryptographies

Time: 11:30-12:10, JAN 11

ABSTRACT: Most quantum cryptanalytic programs can only break one number (e.g. 15 or 21) at a time due to the fact that each Quantum Fourier Transform (QFT) used to find out a period of a particular prime number, requires a unique quantum circuit. To break the RSA, one needs to design a quantum circuit for each prime number being exploited. Since there are a great amount of prime numbers, the current one by one factor finding approach is apparently not conceivable to put into practical use. This session introduces the most recent research to automatically create quantum circuits and use one program to factor multiple prime numbers. The proposed approach to exploit multiple prime numbers at once is a breakthrough toward actual breaking the RSA algorithm. The results are expected to lead a better understanding of quantum algorithms, optimization, programming, and shorten the time to the success in cryptanalytic tasks.

BIO: Dr. Paul Wang is a Professor and Chair of the Department of Computer Science at Morgan State University. He was a TSYS Endowed Chair in Cybersecurity at Columbus State University and the Director of Center for Security Studies at University of Maryland, University College. Paul was previously Chief Information and Technology Officer (CIO/CTO) of the National Biomedical Research Foundation (NBRF). He has held professorships at many universities including University of Maryland, George Washington University, George Mason University, Columbus State University, Morgan State University, and two other universities. Paul was directly involved in drafting of the National Initiatives of Cybersecurity Education (NICE) framework and is currently a member of the NICE committee. His research areas are secure architecture, IoT/CPS, cryptography, quantum cryptology, and video indexing. Paul has extensive knowledge and experiences both in theory and practice. He has been speakers to major national cybersecurity conferences. Dr. Wang has been constantly leading the effort in conducting cutting edge research and establishing cybersecurity programs to train military personnel and veterans in the nation and around the world, a \$250 million award from U.S. Department of Defense, and Director of the biggest cybersecurity education program in the nation with more than 3,000 graduate cyber students.

In addition to books, refereed publications, conference speakers and numeral grant activities including recent grants from National Security Agency, Paul has four patents; three of them have been licensed to the industry. Dr. Wang became a doctoral candidate at Tsinghua University in 1999 and completed his doctoral dissertation under the guidance of Dr. Robert Ledley, the inventor of the body CT scanner at Georgetown University and received his Ph.D. degree at George Mason University in 2004.



Dr. Chau Kien Tsong, Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia, Malaysia

Speech Title: Audio, Visual, and Tactile Integration in Digital Multimedia using Sensing Technologies

Time: 13:30-13:50, JAN 11

ABSTRACT: We are entering the age of ubiquitous sensing. We start to observe smart sensors tracking our health, monitor the operation of machines, and empower autonomous cars. Ubiquitous sensing supports the collaboration of a wide range of specialty areas and disciplines - engineering, business, electronics, computation, and information technology. However, in digital multimedia landscape, deployment of sensors into digital multimedia system is still scarce. Such circumstance may be ascribed to the immense challenges in terms of technicality in implementation. In view of lack of such multimedia, we therefore conduct numerous research works that unite small inexpensive sensors and digital multimedia objects. Dr Chau begins discussion by looking into the implementing sensing technologies explored during the development phase of the research. Discussion followed by elaboration of how sensing system can be bound to digital multimedia elements. Dr Chau's research and exploration demonstrated that sensing technologies in digital multimedia landscape is not only achievable, but also cost-effective. Dr Chau's speech will feature a broad discussion on sensing technology and digital multimedia such as insight into technical challenges, commercial and humanitarian needs, societal impact of sensing systems in digital multimedia, and potential research in the future.

BIO: Dr. Chau Kien Tsong is Deputy Director (Postgraduate, Network & Alumni) at the Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia (USM), Penang, Malaysia. Dr. Chau received his undergraduate degree from the National University of Malaysia (UKM). He has Master of Science (IT) from Prince University of Malaysia (UPM). His PhD. degree is from USM. His academic background is image processing, multimedia authoring, 2D and 3D animations, and educational technology. He has been recognised for excellence in teaching and research, earning 2 gold medals in two international innovation competitions held in 2018 in Malaysia and best paper award for research paper on motivated sensing multimedia system for preschoolers in "International Conference on Education, Teaching, and E-Learning" in 2017. Prior to his career at the USM, Dr. Chau was a research fellow in USM. Dr. Chau is currently editorial board members of three international journals, academic consultant and external examiner of private institutions of higher learning in Malaysia, META and IEEE member, and has been judge, session chair, and program committee for several conferences. Dr. Chau has over 25 publications, which include SCOPUS and ERA indexed journals.