2021年广州大学云–端协同网络计算研讨会

（C4W 2021，The 2021 Collaborative Computing with Cloud and Client Workshop，Guangzhou University, Guangzhou, China）

广州大学●计算机网络研究所

2021 年 5 月 21-23 日

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(C4W 2021，The 2021 Collaborative Computing with Cloud and Client Workshop，Guangzhou University，Guangzhou，China，May 21-23，2021)

会议概述

近年来，随着互联网技术的迅猛发展，出现了以云计算为代表的基于网络的新型计算模式。面对海量的服务请求，由于网络计算开放式的服务模式对计算、存储及网络带宽资源的密集型需求，主流的云计算模式容易遭遇服务端的性能瓶颈。此外，网络计算服务中的安全问题也随着网络软硬件组件的日益复杂而越发严重。因此，亟需研究新型的网络计算服务模式。

云-边-端协同计算是目前网络计算领域发展最为迅猛的主流研究领域之一。与纯粹的云端解决方案相比，包含边缘侧的混合方案可以减少延迟、提高可扩展性、增强对信息的访问量，并使业务开发变得更加敏捷。因此，我们必须着力破解核心技术难点，开展关键产品方案的研发，在实践中掌握云-边-端协同计算平台中的软、硬件核心技术，实现云-边-端协同计算平台的产业化，从而在根本上提高我国互联网特别是移动互联网发展水平及信息安全水平。

广州大学计算机网络研究所（http://trust.gzhu.edu.cn/）将于2021 年 5 月 21-23 日在广东省广州市举办"2021 年广州大学云-端协同网络计算研讨会"。届时将邀请来自国内外教育和科研机构、及业界知名公司的相关专家和学者参会，共同探讨云-边-端协同网络计算的发展现状，以及面临的挑战和未来的发展方向。同时，该研讨会也将为国内外专家和学者提供展示和学习的交流平台。

2021年广州大学云-端协同网络计算研讨会（W4C 2021）会议议程

	2021 年 5 月 21 日（星期五）	
08:00 –20:00	会议注册	负责人：彭滔
17:40 - 20:00	晚餐	
	2021 年 5 月 22 日（星期六）	
	广州华工大学城中心酒店	
8:30-8:40	开幕式	主持人：王国军
8:40-9:25	How to Write a Research Paper 报告人：湖南大学（Hunan University），刘琴副教授	主持人：邢萧飞
9:25-10:10	How to Write High-quality Scientific Paper 报告人：湖南大学（Hunan University），徐旸助理教授	主持人：刘湘勇
10:10- 10:20	茶歇	
10:20-11:05	经典密码学在信息安全领域的新应用 报告人：中南大学（Central South University），段桂华副教授	主持人：陈淑红
11:05-11:50	Edge-Intelligent based Hierarchical Dynamic Pricing 报告人：北京师范大学（Beijing Normal University），王田教授	主持人：彭 滔
12:00-14:00	午餐	
14:30-15:30	Thoughts in the landing of Transparent Computing Theory – Virtualization, Convergence and Manageability 报告人：英特尔中国亚太研发有限公司，吴铭高级工程师	主持人：戴颖龙
15:30-15:50	茶歇	
15:50-16:50	A Method of Creating Intelligent Secure Virtualization and Personalization Session 报告人：英特尔中国亚太研发有限公司，黄富金高级工程师	主持人：苏命峰
16:50-17:35	Intel® Ultra Cloud Client (UCC) Solution and Its Practice 报告人：英特尔中国亚太研发有限公司，沈海高级工程师	主持人：李超良
17:40 - 20:00	晚餐	

	2021 年 5 月 23 日（星期日）	
	广州华工大学城中心酒店	
8:30-9:30	Privacy-Preserving Mechanism for Categorical Data Clustering with Local Differential Privacy 报告人：湖南科技大学（Hunan University of Science and Technology），张少波副教授	**主持人：彭三城**
9:30-10:30	Textual Emotion Analysis in Social Networks 报告人：广东外语外贸大学（Guangdong University of Foreign Studies），彭三城教授	**主持人：张 强**
10:30- 10:50	**茶歇**	
10:50 – 11:50	Efficient Personalized Search over Encrypted Data for Mobile Edge-assisted Cloud Storage 报告人：南昌市大数据发展管理局，张强博士	**主持人：周 雷**
12:00-14:00	**午餐**	
14:30-15:30	A Coprocessor-based Introspection Framework via Intel Management Engine 报告人：南方科技大学（SUSTech），周雷博士后	**主持人：齐 芳**
15:30-16:30	Constructing Interpretable Policy Model for Deep Reinforcement Learning in Multi-Agent Systems 报告人：湖南师范大学（Hunan Normal University），戴颖龙博士	**主持人：张少波**
16:30-16:50	**茶歇**	
16:50-17:50	**自由发言和讨论，所有与会人员** 大家就感兴趣的问题进行自由讨论	**主持人：罗恩韬**
18:00 - 20:00	**晚餐**	

会务信息

会议签到

本次会议在广州市大学城华工北路 68 号华工大学城中心酒店。签到时间：2021 年 5 月 21 日 08:00-20:00。上述时间之外抵达的请直接与会务组联系。

● **交通指引**

路线 1（高铁站）：直接从广州南站（高铁站）乘坐地铁 7 号线到大学城南站 C 出口，出站后打车约 6 分钟到酒店；

路线 2（机场）：从广州白云机场，可乘坐地铁 3 号线到珠江新城换乘 5 号线，到车陂南站再换乘地铁 4 号线到大学城南站 C 出口，出站后打车约 6 分钟到酒店；

路线 3（广州火车站）：可以在广州火车站乘坐地铁 5 号线到车陂南转地铁 4 号线到大学城南站 C 出口，出站后打车约 6 分钟到酒店；

会议住宿安排

本次会议住宿地点为广州市大学城华工北路 68 号华工大学城中心酒店。本次会议住宿房间由会务组统一安排，如有特殊要求请与会务组协商。

会议用餐

本次会议为各位参会人员提供从 5 月 21‐23 日的会议用餐。其中，早餐、中餐为自助餐，晚餐为桌餐。

会议接送与票务

本次会议原则上不为参会者提供接送和票务服务，请各位参会人员自行前往会议地点。如有特殊要求，请与会务组联系。

会务组联系人

彭滔老师：手机：15013229692；EMAIL：pengtao_work@163.com。

湖南大学刘琴副教授学术报告

报告时间： 5 月 22 日（星期六） 8:40 – 9:25

报告地点： 广州华工大学城中心酒店•南粤厅

报告人： 湖南大学（Hunan University）刘琴副教授

报告题目： **How to Write a Research Paper**

报告提要： Research beginners are usually feeling difficult on writing a research paper in English. In this talk I will share some personal experiences on English writing for research papers. First, I will describe some common errors from the feedback of reviewers. Next, I will share our experiences on writing and revising research papers, and highlight the key elements of paper writing. Finally, I will share some common rules/principles that can be easily use in writing English research papers.

报告人简介： Qin Liu received her B.S. in Computer Science in 2004 from Hunan Normal University, China, received her M.S. in Computer Science in 2007, and received her Ph.D. in Computer Science in 2012 from Central South University, China. She has been a Visiting Student at Temple University, USA. Now, she is an Associate Professor in the College of Computer Science and Electronic Engineering at Hunan University, China. Her research interests include security and privacy issues in cloud computing and social networks, and big data security. She has published more than 60 technical papers and books/chapters in the above areas, including top international journals and conferences like IEEE TPDS, IEEE TSC, ACM CCS, IEEE INFOCOM, and so on. She has been serving as a Guest Editor, Conference vice Co-chair, Workshop Co-Chair, Publicity Chair/Co-Chiar, TPC, and reviewer for international journal/conference proceedings.

湖南大学徐旸助理教授学术报告

报告时间： 5 月 22 日（星期六） 9:25 - 10:10

报告地点： 广州华工大学城中心酒店·南粤厅

报告人： 湖南大学（Hunan University）徐旸助理教授

报告题目： How to Write High-quality Scientific Paper

报告提要： In this report, I will share some of my long-term experience in writing scientific papers. To design a good program, you need to gradually refine it from top to bottom, and in the same way to papers. Therefore, the first thing I want to introduce is the structure of scientific papers and the writing focus of each part of the content. Secondly, a high-quality scientific paper must not only have eye-catching innovations but also have good readability. In this case, I will share some tips to improve the readability and quality of the paper. In addition, a high-quality paper undoubtedly needs to be refined and revised repeatedly, so I will describe how your article will be reviewed from the reviewer's perspective. Finally, I will also share some tools and templates for writing manuscripts.

报告人简介： Yang Xu received the Ph.D. degree in Computer Science and Technology from Central South University, China. From 2015 to 2017, he was a visiting scholar in the Department of Computer Science and Engineering at Texas A&M University, USA. He is currently an Assistant Professor at the College of Computer Science and Electronic Engineering, Hunan University, China. His research interests include security and privacy issues in cloud computing, blockchain, and operating system. He has published over 40 articles in international journals and conferences, including IEEE TSC, TII, TETC, TCBB, TNSE etc. He was the awardee of the Best Paper Award of IEEE International Conference on Internet of People. He serves/has served as a Steering Committee Chair and Program Committee Chair for IWCSS 2020, a Track Chair for IEEE CyberSciTech 2020, the Publicity Chair for CPSCom 2020, Blocksys 2020, ISSR 2019, Ubisafe 2019, and a reviewer for over 20 international journal/conference proceedings. He is a member of Blockchain Technical Committee of CCF, and a member of IEEE and ACM.

中南大学段桂华副教授学术报告

报告时间： 5 月 22 日（星期六） 10:20 - 11:05

报告地点： 广州华工大学城中心酒店·南粤厅

报告人： 中南大学（Central South University）段桂华副教授

报告题目： 经典密码学在信息安全领域的新应用

报告提要： 网络信息安全随着信息化和智能化的步伐变得越来越重要，密码算法作为信息安全的核心技术之一，是每一个从事安全研究人员的必备知识。本报告在介绍基本密码协议的基础上，针对当前大数据时代用户隐私保护问题，探讨盲签名协议、不经意传输协议、安全计算协议等高级密码协议的变形应用。

报告人简介： 段桂华，博士，中南大学副教授，计算机学院网络空间安全系书记。主要从事信息安全和密码学方面的教学与科学研究，发表学术论文 20 余篇，主持或参与国家自然科学基金项目 6 项，担任过 IJAACS 专刊的 Guest Editor、TrustCom2012 的 Program Co-Chair，曾获得省级教学竞赛一等奖、湖南省普通高校青年教师教学能手、湖南省高校教工党支部书记"双带头人标兵"称号。

北京师范大学王田教授学术报告

报告时间： 5 月 22 日（星期六） 11:05 – 11:50

报告地点： 广州华工大学城中心酒店·南粤厅

报告人： 北京师范大学（Beijing Normal University）王田教授

报告题目： **Edge-Intelligent based Hierarchical Dynamic Pricing**

报告提要： Nowadays, IoT systems can better satisfy the service requirements of users by effectively utilizing edge computing resources. Designing an appropriate pricing scheme is critical for users to obtain the optimal computing resources at a reasonable price and for service providers to maximize profits. This problem is complicated with incomplete information. The state-of-the-art solutions focus on the pricing game between a single service provider and users, ignoring the competition among multiple edge service providers. Therefore, it is urgent to investigate a hierarchical dynamic pricing scheme. This talk will discuss the mixed game and dynamically pricing problems in the IoT systems and attempt to identify an effective service pricing scheme based on cloud-edge-client collaboration.

报告人简介： Prof. Wang received his BEng and MEng degrees in computer science and technology from Central South University and his Ph.D. degree in Computer Science from the City University of Hong Kong. He is currently a full professor at Beijing Normal University.

Prof. Wang is the top 2% scientist according to "World's Top 2% Scientists 2020," published by Stanford University. He was supported by the "Hundred-Thousand-Ten Talent Project" and Science Fund for Distinguished Young Scholars of Fujian Province.

His research covers a wide range of topics, including Internet of Things, Edge Computing, Mobile Computing. He has published over 200 papers in reputed high-level journals and conferences, including 20 IEEE/ACM Transactions papers. He has more than 6800 citations (H-Index is 42), according to Google Scholar.

英特尔高级工程师吴铭学术报告

报告时间： 5 月 22 日（星期六） 14:30 – 15:30

报告地点： 广州华工大学城中心酒店·南粤厅

报告人： Wu Ming, Engineering Manager, Intel Corporation

报告题目： Thoughts in The Landing of Transparent Computing Theory – Virtualization, Convergence and Manageability

报告提要： Transparent Computing (TC) theory is a special kind of cloud computing by regarding the storage as a service. TC logically splits the software stack from the underlying hardware platform, and separates the computing unit and storage for the purpose of making the same software run on different hardware and different software run on the same hardware. With the rapid acceleration and public adoption of this technology, more and more requests have raised including virtualization, convergence and manageability. This report briefly presents some thoughts in Transparent Computing implementation, although still in very early stages. Also we are going to share some experiences in TC's engineering practices.

报告人简介： Wu Ming (ming.m.wu@intel.com) received his B.Sc. and M.Sc degrees in computer science, from Tsinghua University, China, in 1997 and 1999 respectively. He also held a minor degree of B.Economics from Tsinghua University in 1997. Ming joined Intel in 2004 and served as different technical leadership roles like senior engineer and engineering manager in SSG. He led the development of several UEFI embedded projects including Intel® Boot Loader Development Kit and Intel® Software Solution for Transparent Computing, and owned the collaboration with universities and enterprises in Transparent Computing. His working interests include computer architecture, computer network, distributed system and embedded systems, and he published several technical papers in these areas. Before joining Intel he worked for two startup companies to build internet router and network security equipment.

英特尔高级工程师黄富金学术报告

报告时间： 5 月 22 日（星期六） 15:50 – 16:50

报告地点： 广州华工大学城中心酒店·南粤厅

报告人： Fujin Huang, Architect, Intel Corporation

报告题目： A Method of Creating Intelligent Secure Virtualization and Personalization Session

报告提要： With the speed of constant change, it's much harder to provide user a secure and simplify persistent computing environment. Currently the typical solution would be virtualization. Traditional virtualization at hardware and operating system level provides an efficient way to run different services on the local hardware and in remote cloud. However, Full virtualization and para-virtualization (such as VDI solution) are quite expensive and complex, and heavily rely on the network condition. Moreover, it provides no data protection from system level. The intelligent virtualization technology is designed to offer superior performance, secure and lower cost computing solution, and aims to offer user the portable computing environment. In this paper, we present a method of creating intelligent virtualization and personalization session, as well as its strengths and weaknesses analysis. We also share the engineering practice experience on how we leverage this technology to create secure computing sessions using physical devices.

报告人简介： Fujin Huang (fujin.huang@intel.com) received his B.Sc. degree in Control Science and Engineering (CSE) from Nanchang University, China, and his M.Sc. degree in CSE from Shanghai Jiaotong University, China, in 2005 and 2008, respectively. Fujin is the senior engineer and architect of Intel China Asia Pacific R&D Ltd. Since Fujin joined Intel in 2008, he contributed in various product projects from UEFI BIOS to Turn-Key solutions, and filed several technical patents. His research interests include cloud computing, big data and edge computing.

英特尔高级工程师沈海学术报告

报告时间： 5 月 22 日（星期六） 16:50 – 17:35

报告地点： 广州华工大学城中心酒店·南粤厅

报告人： 沈海，英特尔（中国）有限公司，行业市场经理

报告题目： Intel® Ultra Cloud Client (UCC) Solution and Its Practice

报告提要： Cloud Client infrastructure becomes the mainstream client computing architecture, while client management and serviceability is critical for overall system performance and user experience. This session will introduce mainstream cloud client infrastructures and focused on Intel® Ultra Cloud Client (UCC) solution with its key features, system level architecture and use cases.

报告人简介： Hai Shen received his B.S. and M.S. degree in Computer Science and Software Engineering from Northwestern Polytechnical University in 2003 and 2006. Hai has been working in Intel for 16+ years across Software and Internet of Things groups, served various roles as training & academic program manager, community manager, technical marketing engineer and segment marketing manager.

湖南科技大学张少波副教授学术报告

报告时间： 5 月 23 日（星期日） 8:30 – 9:30

报告地点： 广州华工大学城中心酒店·沁园春厅

报告人： 湖南科技大学（Hunan University of Science and Technology）张少波副教授

报告题目： Privacy-Preserving Mechanism for Categorical Data Clustering with Local Differential Privacy

报告提要： In big data mining, the K-modes has become a popular clustering method for categorical data owing to its simplicity and efficiency. However, the data clustering process of the K-modes method will cause the risk of user privacy leakage because user data usually contain sensitive information. To address this issue, general solutions introduce a trusted third-party model for privacy protection in clustering analysis, but it is difficult to find a fully trusted entity in reality. Aiming at this issue, we propose a Local Differential Privacy K-modes (LDPK) mechanism, which does not require any trusted third-party to perform privacy preprocessing on user data. The mechanism first uses random sampling technology to sample the data, then perturbs the sampled data using local differential privacy, and finally completes the clustering through the interaction between server and user. Furthermore, we propose a privacy protection enhancement mechanism (ELDPK) by extending the LDPK mechanism, which disturbs the user's clustering information in each iteration to further protect the user's privacy.

报告人简介： Shaobo Zhang received the B.Sc. and M.Sc. degrees in computer science from Hunan University of Science and Technology, China, in 2003 and 2009, respectively, and the Ph.D. degree in computer science from Central South University, China, in 2017. He is currently an Associate Professor with the School of Computer Science and Engineering, Hunan University of Science and Technology, China. His research interests include security and privacy issues in social networks and cloud computing.

广东外语外贸大学彭三城教授学术报告

报告时间： 5 月 23 日（星期日） 9:30 - 10:30

报告地点： 广州华工大学城中心酒店·沁园春厅

报 告 人： 广东外语外贸大学（Guangdong University of Foreign Studies）彭三城教授

报告题目： **Textual Emotion Analysis in Social Networks**

报告提要： Textual emotion analysis aims to extract and analyze emotional states of users in text. In this talk, we provide an overview on the different types of deep learning methods for emotion analysis. We will provide an introduction for the background knowledge of emotion analysis. Then, we will discuss the deep learning technology, and the word/sentence representation learning method. Next, we will introduce the existing methods into four categories according to their text structures and linguistic types: text-oriented monolingual methods, text conversations-oriented monolingual methods, text-oriented cross-linguistic methods, and emoji-oriented cross-linguistic methods. Finally, we will enumerate our proposed models on textual emotion analysis.

报告人简介： Sancheng Peng received the PhD degree in computer science in 2010 from Central South University, China. He is a Professor of Guangdong University of Foreign Studies, China. He was a Research Associate of City University of Hong Kong from 2008 to 2009. His research interests include network and information security, natural language processing, social networks, and mobile computing. He is a senior member of the CCF and a member of the ACM.

南昌市大数据发展管理局张强博士学术报告

报告时间： 5 月 23 日（星期日） 10:50 - 11:50

报告地点： 广州华工大学城中心酒店 • 沁园春厅

报告人： 南昌市大数据发展管理局 张强博士

报告题目： **Efficient Personalized Search over Encrypted Data for Mobile Edge-assisted Cloud Storage**

报告提要： Cloud storage services allow a data owner to share her/his outsourced data with other users, and enable the users to search target data by keywords. To ensure the data confidentiality, data owner always encrypt data using traditional encryption schemes before outsourcing. Whereas, it makes efficiently searching impossible. Symmetric searchable encryption (SSE) is a cryptographic primitive that resolves this tension. However, most existing SSE schemes do not consider the individual characteristics of users during the search, such that they cannot support personalized search services over encrypted data. Meanwhile, security and efficiency issues in the cloud service model have also severely affected the user's search experience, and the introduction of mobile edge servers can solve these problems to some extent. We propose a personalized searchable encryption scheme (PSED) for mobile edge-assisted cloud storage. Our contribution consists of three aspects. First, we incorporate the user's preference factors into the user's query which enable users to get accurate personalized search results. Second, the computational overhead of the cloud server is reduced by calculating the relevance scores of the subqueries and subindexes on mobile edge servers. Third, by cutting the index and the query matrix, the encryption efficiency of the index and the query matrix is improved. Security analysis shows that PSED can guarantee the privacy of the data and the user. Experimental results demonstrate that the proposed schemes are highly efficient and accurate.

报告人简介： Qiang Zhang received the B.S. degree from Central South University, China, in 2011, and the M.S. degree from University of Chinese Academy of Sciences, China, in 2014. and the Ph.D degree from Central South University, China, in 2019. Now, he is a section chief of Big Data Development Administration of Nanchang Municipality. He was a visiting Ph.D. student in the Department of Electrical and Computer Engineering, University of Waterloo, Canada. His research interests include privacy preserving, cloud computing and information retrieval.

南方科技大学周雷博士后学术报告

报告时间：5 月 23 日（星期日） 14:30 – 15:30

报告地点：广州华工大学城中心酒店·沁园春厅

报告人：南方科技大学（SUSTech）周雷博士后

报告题目： **A Coprocessor-based Introspection Framework via Intel Management Engine**

报告提要： Existing virtualization-based (e.g., virtual machine introspection) and hardware-assisted approaches (e.g., x86 SMM and ARM TrustZone) have been used to defend against low-level malware such as rootkits. However, these approaches either require a large Trusted Computing Base (TCB) or they must share CPU time with the operating system, disrupting normal execution. We propose an introspection framework called NIGHTHAWK. It leverages the Intel Management Engine (IME), a co-processor that runs in isolation from the main CPU, introducing a minimal TCB and incurs negligible overhead on the host system on a suite of indicative benchmarks. We use NIGHTHAWK to introspect the system software and firmware of a host system at runtime, which can detect real-world attacks against the OS, hypervisors, and System Management Mode while mitigating several classes of evasive attacks. Additionally, NIGHTHAWK can monitor the runtime state of host system against the suspicious applications running in target machine.

报告人简介： Lei Zhou received the PhD degree in Computer Science from Central South University. He has been a Visiting Student at Wayne State University, USA. Now he is a Post-doctoral Fellow in the Department of Computer Science and Engineering at Southern University of Science and Technology (SUSTech). His primary research interests are in the areas of x86 systems security, including trustworthy execution, hardware-assisted security, and memory forensics.

湖南师范大学戴颖龙博士学术报告

报告时间： 5 月 23 日（星期日） 15:30 – 16:30

报告地点： 广州华工大学城中心酒店·沁园春厅

报告人： 湖南师范大学（Hunan Normal University）戴颖龙博士

报告题目： **Constructing Interpretable Policy Model for Deep Reinforcement Learning in Multi-agent Systems**

报告提要： Borrowing the high-dimensional data cognitive ability of deep learning, reinforcement learning (RL) achieved a great success and opened a new research sub-branch termed deep reinforcement learning (DRL). Nevertheless, the advantages of deep learning methods are also accompanied with the fatal disadvantage, i.e., weak model interpretability. Weak interpretability becomes a serious impediment to apply DRL agents in some areas with high reliability requirements, such as healthcare, military, transportation, and finance. Recently, researchers tried to use the saliency map techniques to interpret the behaviors of DRL agents. Saliency maps reflect the importance of some parts of observations, but the interpretable representations are still not so clear that can present the cause and effect between an agent's actions and its observations. We propose to discover the cause and effect, introduce prior knowledge, and construct hierarchical deep reinforcement learning architecture that can facilitate to form the interpretable inference process of an agent's policy.

报告人简介： Yinglong Dai received B.S. and M.S. degrees in automation and control theory & control engineering from Northeastern University, China, in 2010 and 2012, respectively. He received a Ph.D. degree in computer science from Central South University, China, in 2018. From 2012 to 2013, he was an Electronic Engineer with the Research Institute of Intelligent Engineering, Sany Heavy Industry, Changsha, China. At present, he is a lecturer with College of Information Science and Engineering, Hunan Normal University, Changsha, China.

His research interests include multimodal deep learning, deep reinforcement learning, healthcare, and multi-agent systems. At present, he has 16 published papers, including 7 SCI-indexed papers (https://www.researchgate.net/profile/Yinglong_Dai).