2020 年物联网与云边协同国际论坛

（二）

程 序 册

主办单位：安徽省物联网安全技术工程实验室
安徽省计算机学会

承办单位：安徽大学计算机科学与技术学院

安徽 合肥

2020 年 11 月 21 日

论坛背景

随着 5G 移动通信的全球商用部署，移动互联网及物联网业务呈指数式增长。5G 移动通信系统传输带宽更大且时延更低，以 5G、云计算、边缘计算、区块链、大数据等为代表的新一代信息技术正在全面融合于物联网中，加速推进云-边-端的智能融合，催生新型物联网系统架构。在新型物联网中，终端设备海量连接且类型混杂，网络形态更加异构多元，安全边界更加模糊，产生的数据将呈爆炸式增长，云-边-端协同的数据安全和隐私保护问题是亟需解决的关键问题之一。

2020 年物联网与云边协同论坛将邀请物联网与云计算领域的国际顶级专家和学者，分享物联网与云边协同的学术成果，旨在为突破云-边-端物联网的核心关键技术提供有益的思考和方向。

本次论坛汇聚了从事网络与信息安全理论及应用研究的科研人员，广泛开展学术交流，研究发展战略，共同促进相关理论、技术及应用的进一步发展。本次论坛有幸邀请到 Maozhen Li 教授（英国布鲁内尔大学）、Geyong Min 教授（英国埃克塞特大学）、John Panneerselvam 博士（英国莱斯特大学）、Minsi Chen 博士（英国哈德斯菲尔德大学）和 Bo Yuan 博士（英国德比大学）与会做数场特邀报告。

预祝本次论坛圆满成功！

2020 年物联网与云边协同论坛（二）日程安排

会议时间：2020 年 11 月 21 日

会议地点：Zoom 网络会议室&安徽大学磬苑校区理工 D 楼 318 会议室

主办单位：安徽省物联网安全技术工程实验室

安徽省计算机学会

承办单位：安徽大学计算机科学与技术学院

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<tr><td>时间</td><td>报告人</td><td>报告题目</td><td rowspan="4">Lu Liu
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<tr><td>21:00-21:40</td><td>Bo Yuan 博士（英国德比大学）</td><td>A Self-organized Architecture for Efficient Service Discovery in Future Peer-to-Peer Online Social Networks</td></tr>
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论坛报告 1

题　目：　Interpreting Deep Neural Networks

报告人：　Professor Maozhen Li (Brunel University London)

摘　要：Deep Neural Networks (DNNs) have been successfully applied in many areas. This talk presents a recent research work on human re-identification using a deep convolutional neural network (CNN) which is empowered with an attention mechanism. It has been widely accepted that tuning the performance of DNNs is notably hard due to the large number of hyperparameters involved in the training process. As a result, DNNs are normally considered as black-boxes. For this purpose, this talk introduces the work of employing gene expression programming to interpret the performance (i.e. accuracy and training time) of a CNN by analyzing the correlation of the major hyperparameters. Further challenges on DNN interpretability are also discussed in this talk.

报告人简介：Professor Maozhen Li received his PhD from the Institute of Software, Chinese Academy of Sciences in 1997. He completed his Post-Doc research in the School of Computer Science and Informatics at Cardiff University, UK in 1999-2002. He is a Professor in the Department of Electronic and Computer Engineering at Brunel University London UK, and also a Visiting Professor of Tongji University. His research interests are in the areas of high-performance computing including cloud computing and edge computing, big data analytics, and intelligent systems with applications in smart grid and smart cities. He has over 180 scientific publications in these areas including 4 books and 90 peer reviewed journal papers. He has served over 30 IEEE conferences. He was the Chair of the TPC of FSKD'16, FSKD'14 and FSKD'12 respectively and he is on the Editorial Boards of a number of journals. His collaborative research with Tongji University on Intelligent Transportation Systems was nominated by the Institution of Engineering and Technology (IET) for its Innovation Award in November 2015. He is a Fellow of the British Computer Society and the IET.

论坛报告 2

题　目：Online Anomaly Prediction and Detection in Future Intelligent Internet

报告人：Professor Geyong Min (University of Exeter)

摘　要：Future Internet will integrate heterogeneous wireless access technologies and effective artificial intelligence tools to provide smart, high-speed, reliable, and ubiquitous wireless communications. A grand challenge in such a complex system is: a single failure of devices or malicious attack can trigger a large number of alarms, leading to massive and redundant alarm information with high complexity and correlations. To address this challenge, this talk will present a new method for data modelling and processing, namely Support Vector Data Description (SVDD), aiming to find a hypersphere (closed boundary) around the known dataset that can enclose all the training data with the minimum volume. The ultimate objective is to accurately predict and quickly detect anomaly behaviors from massive alarm information, which is very important for reducing the network operational expenditure and enhancing the intelligence and Quality-of-Service of future Internet. An open and distributed platform for network big data processing will then be presented to demonstrate its application for anomaly prediction and fault detection.

报告人简介：Professor Geyong Min is a Chair in High Performance Computing and Networking. His research interests include Computer Networks, Cloud and Edge Computing, Mobile and Ubiquitous Computing, Systems Modelling and Performance Engineering. His recent research has been supported by European Horizon-2020, UK EPSRC, Royal Society, Royal Academy of Engineering, and industrial partners. He has published more than 200 research papers in leading international journals including IEEE/ACM Transactions on Networking, IEEE Journal on Selected Areas in Communications, IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Systems, and IEEE Transactions on Wireless Communications, and at reputable international conferences, such as SIGCOMM-IMC, INFOCOM, and ICDCS. He is an Associated Editor of several international journals, e.g., IEEE Transactions on

Computers, and IEEE Transactions on Cloud Computing. He served as the General Chair or Program Chair of a number of international conferences in the area of Information and Communications Technologies.

论坛报告 3

题　目：Towards sustainable datacentres by leveraging the power of knowledge

报告人：Dr. John Panneerselvam (University of Leicester)

摘　　要：Cloud datacentres are addressed to as massive energy consumers. Cloud service providers usually tend to over-provision the resource requirements of task execution, which leaves most of the provisioned resources unutilised. An increased proportion of active server resources in the datacentres not only requires more input power but also leaves high level of carbon footprints in the environment. While it is imperative for providers to reduce such energy consequences, this is an extremely challenging task due to the heterogeneous nature of task behaviours at the datacentres. Herein, an understanding of the behavioural characteristics of the tasks at the datacentre and their energy implications are still required to drive sustainability in datacentre execution. Addressing this issue, our research in recent years has a primary focus on studying the task behaviours by deeply investigating the execution trace logs of various datacentres such as Google, Alibaba etc. This talk presents some of our recent findings about the intrinsic task behaviours during datacentre execution, which urges a strategic shift in the way tasks are being treated so far at the datacentres. As well as we identified the hidden yet unknown ‘energy-aware straggling’ behaviours of tasks, we also developed a few notable prediction models to reliably predict the behaviours of tasks in terms of their resource consuming behaviours. This talk also presents some of our prediction models in this context, and opens up new challenges as we move towards sustainable datacentres.

报告人简介：Dr John Panneerselvam is a Lecturer in Informatics at the University of Leicester, United Kingdom. John received his PhD in computing from the University of Derby in 2018 and an MSc in advanced computer networks in 2013. His PhD thesis has been nominated to the BCS distinguished dissertation award by his supervisor Prof Lu Liu. He is an active member of IEEE and British Computer Society, and a HEA fellow. John holds more than 50 publications in reputed international journals such as IEEE Transactions on Sustainable Computing, IEEE Transactions on

Emerging Topics in Computing, IEEE Transactions on Industrial Informatics, IEEE Systems Journal, Future Generation Computer Systems etc. His research interests include cloud computing, fog computing, Internet of Things, big data analytics, inter-disciplinary analytics, and P2P computing. He also serves as a reviewer for a number of reputed journals including IEEE transactions on cloud computing, IEEE transactions on Sustainable Computing, Future Generation Computer Systems etc.

论坛报告 4

题　目：Dynamic data visualisation and information theory

报告人：Dr. Minsi Chen (University of Huddersfield UK)

摘　要：Large scale simulations and visualisation in medicine and physics are often used to help understand and predict diseases and complex physical phenomenon. These simulations are often run on HPCs in batches which impose limitations on our ability to interactively interrogate their visualisation in-situ. This talk first discusses a heterogeneous compute platform for generating data visualisation in-situ. This is followed by a discussion on the use of information theory to automatically generate “important views” of time varying data.

报告人简介：Dr Minsi Chen is currently a senior lecturer in the Depart of Computer Science at the University of Huddersfield UK. He read computer science at the University of East Anglia (UEA) UK. He was awarded a BSc (Hons) in 2000, Msc in 2002, and completed his PhD in 2006, all from UEA. He worked as a software engineer before joining University of Oxford as a post-doctoral research in 2008. After spending 4 years at Oxford, he obtained a lectureship at the University of Derby until 2017.

His main research interest centred on the theory and application of computer graphics. In particular, he has worked on several projects involving medical imaging and visualisation. Some past projects include CASSPAR - a surgical navigation system for keyhole ENT procedures; CAT&MAUS - a motion aware ultrasound imaging system for evaluation musculoskeletal conditions; CERREBRAL - a haemodynamic simulation framework for brain aneurysms.

论坛报告 5

题　目：面向对等网络的高效社会化资源发现模型

报告人：　Dr. Bo Yuan (University of Derby)

摘　要：对等网技术作为重要的互联网技术，在很多网络系统中得到了广泛的使用。对等网打破了传统的 Client/Server 模式，在网络中的每个节点的地位都是对等的。本讲座将针对对等网络服务发现难的问题，重点介绍如何在对等网环境下构建自组织架构模型及实现高效“社会化”资源发现算法。

报告人简介：

Bo Yuan is currently a Lecturer in Computing and academic in Data Science Research Centre, with School of Electronics, Computing and Mathematics, University of Derby, UK. He received the B.Sc. degree in computer science and technology and the Ph.D. degree in computer science from Tongji University, Shanghai, China, in 2011 and 2018, respectively. He completed his Postdoctoral research on big data analytics in the field of retail industry and designed AI products for world-renown retailers to cut IT costs, provide forecast capability and speed up decision-making.

With his team in the data science centre, he explores applied machine learning techniques and business-oriented data science to help industrial companies establish cost-effective IT infrastructures and the state-of-the-art AI solutions. He is specialising in helping executives and managers use analytics to make data-driven decisions and gain competitive advantage. He is an active member of Institute of Electrical and Electronics Engineers (IEEE). His areas of expertise include Industrial Internet of things, data science for business, Cloud computing architecture design, and AI-driven advanced engineering.