

REPORT TITLE AND SUMMARY

Blockchain, Big Data, and AI for Smart Industrial Internet

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Abstract

Blockchain, Big data, and AI (Artificial Intelligence) become essential for the cyber digital world. They also bring a lot of impacts on Industrial Internet. In this talk, we will overview blockchain, big data, AI, and smart Industrial Internet. We will address the challenge issues in applications of blockchain, big data and AI for smart Industrial Internet.



Jie Li

Jie Li is a chair Professor in Department of Computer Science and Engineering, School of Electronic Information and Electrical Engineering, Shanghai Jiao Tong University (SJTU). His research interests are in big data and AI, blockchain, computer networking and security, information system architectures. He is the director of SJTU Blockchain Research Center. He is a co-chair of IEEE Big Data Community and chair of IEEE ComSoc Technical Committee on Big Data. He received the B.E. degree in computer science from Zhejiang University, Hangzhou, China, the M.E. degree in electronic engineering and communication systems from China Academy of Posts and Telecommunications, Beijing, China. He received the Dr. Eng. degree from the University of Electro-Communications, Tokyo, Japan. He was a professor in University of Tsukuba, Japan. He is a senior member of IEEE and ACM. He has served on editorial boards of IEEE journals and transactions. He also has served in the program committees for several international conferences.

Dynamic Opinion Maximization in Social Networks

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Abstract

Opinion Maximization (OM) aims at determining a small set of influential individuals, spreading the expected opinions of an object (e.g., product or individual) to their neighbors through the social relationships and eventually producing the largest rational opinion spread. In previous studies, once the corresponding nodes are activated, their opinions usually keep unchanged, which fails to capture the real scenarios where the opinion of each node on the object can dynamically change over time. In this view, we propose a Dynamic Opinion Maximization Framework (DOMF) to settle the OM problem, which consists of two parts: dynamic opinion formation and adaptive seeding process. Specifically, we formulate the OM problem by maximizing rational opinions. To model the dynamic opinion issue, we propose adaptive cooperation model based on Q-learning theory, which is proved to be capable of eventually reaching convergence. Moreover, to dynamically generate the initial seed nodes, we design the Multi-stage Heuristic Algorithm (MHA). Experimental results on eight network datasets demonstrate that each component of our model is effective, and the proposed approach improves the rational opinion spread over the state-of-the-art methods.



Xingwei Wang

Xingwei Wang received the B.S., M.S., and Ph.D. degrees in computer science from the Northeastern University, Shenyang, China in 1989, 1992, and 1998 respectively. He is currently a Professor at the College of Computer Science and Engineering, Northeastern University, Shenyang, China. He is the winner of National Science Fund for Distinguished Young Scholars of China and the Fellow of China Institute of Communications. His research interests include cloud computing and future Internet, etc. He has published more than 100 journal articles, books and book chapters, and refereed conference papers. He has received several best paper awards.

IoT Security and Privacy Using Machine Learning

Xiangjian He

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Abstract

This talk presents our recent survey on IoT security and privacy using machine learning techniques. Cyber threats are growing at an explosive pace making the existing security and privacy measures inadequate. Hence, everyone on the Internet is a product for hackers. Consequently, Machine Learning (ML) algorithms are used to produce accurate outputs from large complex databases, where the generated outputs can be used to predict and detect vulnerabilities in IoT-based systems. In this talk, we provide a summary of research efforts made in the past few years, addressing security and privacy issues using ML algorithms techniques in the IoT domain. First, we discuss and categorize various security and privacy threats. Then, we classify the literature on security and privacy efforts based on ML algorithms techniques. Finally, we identify and illuminate several challenges and future research directions in using ML algorithms to address security and privacy issues.



Xiangjian He

Professor Xiangjian He is the Leader of Computer Vision and Pattern Recognition Laboratory at the Global Big Data Technologies Centre (GBDTC) at the University of Technology Sydney (UTS). He was involved in a team receiving a UTS Chancellor's Award for Research Excellence through Collaboration, for a project funded by SydneyTrains and RMCRC, in 2018. He led the UTS-PolyU joint research project teams (PolyUTS) winning the 1st Runner-Up prize for the 2017 VIP Cup, and the champion for the 2019 VIP Cup, awarded by IEEE Signal Processing Society. The team, PolyUTS, co-led by Prof He again won the 1st Runner-Up award for the 2021 VIP Cup. He has been carrying out research mainly in the areas of image processing, network security, pattern recognition, computer vision and machine learning in the previous years. He has played various chair roles in many international conferences such as ACM MM, MMM, ICDAR, IEEE BigDataSE, IEEE BigDataService, IEEE TrustCom, IEEE CIT, IEEE AVSS, IEEE TrustCom, IEEE ICPR and IEEE ICARCV. He has received many competitive national or regional grants including five grants awarded by Australian Research Council (ARC). In recent years, he has many high quality publications in prestigious journals including IEEE Transactions journals such as IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), Pattern Recognition (Elsevier), etc. He has also had papers published in premier international conferences and workshops such as ACL, IJCAI, CVPR, ECCV, ACM MM, ICDAR, WACV, etc. He has recently been involved in editing for various international journals such as IEEE Transactions on Intelligent Transportation Systems, Journal of Computer Networks and Computer Applications (Elsevier), Future Generation Computer Systems (Elsevier), and Signal Processing (Elsevier). He has been an Advisor of HKIE Transactions, and is currently an Associate Editor of Springer-Nature Computer Science Journal and the journal of Human-centric Computing and Information Sciences.