The 8th IEEE International Conference on Cyber Security and Cloud Computing (IEEE CSCloud 2021)

The 7th IEEE International Conference on Edge Computing and Scalable Cloud (IEEE EdgeCom 2021)

June 26-28, 2021
Washington DC, USA

Conference Program and Information Booklet

Organized By
IEEE CSCloud/EdgeCom 2021 Committee

Sponsored By
IEEE
IEEE Computer Society
IEEE TCSC
IEEE STC Smart Computing
North America Chinese Talents Association
Longxiang High Tech

About IEEE SCSTC

Welcome to IEEE Computer Society Smart Computing Special Technical Community (SCSTC)

IEEE SCSTC is built up for changing people's future work and life; attracting intelligent computing talents in smart computing field; producing high quality research work and services in human-centric technologies to change the world; leading the research of smart computing by solving challenging problems; and expanding the smart computing community in a self-sustainable financial way. Two main layers are involved in the concept of smart: one is the traditional optimization; the other one is the intelligent living.

Vision: IEEE Computer Society Smart Computing STC is to enable smart life with smart data, smart cloud, and smart security and become a community leader in these technical fields.

We will create a smart computing society for changing people's future work and life; attract intelligent computing talents in smart computing field; produce high quality research work and services in human-centric technologies to change the world; lead the research of smart computing by solving challenging problems; and expand the smart computing community in a self-sustainable financial way. Two main layers are involved in the concept of smart: one is the traditional optimization; the other one is the intelligent living.

Mission: IEEE Computer Society Smart Computing STC is to utilize smarting computing technologies to increase humans' life by integrating smart data, smart cloud, and smart security in both optimizations and intelligences. We will build up the largest professional and academic community in smart computing and aim to enhance humans' life by utilizing smart computing technologies. This expected community will be providing an integrative research platform for global researchers who are interested in smart computing that covers both optimizations and intelligent living. The target area is a convergence of three novel dimensions at the collaborative application layer, namely smart data, smart cloud, and smart security. This is a social network-based community that is planned to be a long-term self-sustaining organization.

Purpose: The main purpose of this proposed STC is to serve the smart computing research community and advance the research by covering three dimensions, including smart data, smart cloud, and smart security. Current existing STCs cannot satisfy the demands of research interests in convergences of multiple disciplines, which include data, cloud computing, and security. Most existing STCs only have isolative focus in one specific field. However, data, cloud computing, and security are becoming strongly tied techniques, which are hard to separately considered for many contemporary researches or future technical development. Therefore, building up a STC in Smart Computing has an urgent demand for both smart computing research and professional practices.

Scope: the scope of Smart Computing STC is a technical group within the Computer Society. Term Smart in "Smart Computing" mainly covers two aspects, including optimizations and intelligence, by which smart concept will be adopted for new networking-oriented technologies. We are looking for intelligent approaches gaining optimal performances by high-speed data mining and data analysis throughout all aspects in distributed computing and integrated systems. Both aspects are strongly relevant to the performance of the system at the application layer during the process of data transmissions within the distributed environment. This concentration emphasizes the optimizations and intelligences of networking performances and empowers the capabilities of the connected computing devices in distributed systems, which distinguishes from other societies or communities.

Activities: IEEE Computer Society Smart Computing STC organizes a bunch of research community-oriented activities. We aim to unionize scholars or students who have similar or relevant research interests in smart computing and grow the research community globally. Our memberships owners will have a great opportunity to build up an active social network and strengthen the knowledge scope throughout the following activities:

- Improve communications and interconnections between peers.
- Explore the theory, applications, implementations, and research of smart computing.
- Publish whitepapers, reports, technical manual, and handbooks on research, policies, standards, products, services, and applications.
- Organize conferences and workshops that are related to smart computing.
- Release newsletters with updated news regularly.
- Host academic publications focusing on smart computing.
- Develop smart computing standards.
- Standardize the mechanisms, operating principles, and industrial manual guidelines.

Official Permanent Site: https://stc.computer.org/smart-stc/

IEEE CSCloud/EdgeCom 2021 Program at a Glance

Saturday, June 26th, 2021	
	Conference Room
8:45 – 9:00	Opening
9:00 – 10:00	Keynote 1
10:00 – 10:10	Break
10:10 – 11:10	Keynote 2
11:10 – 11:20	Award Session
11:20 – 12:20	CSCloud Session 1
12:20 – 13:30	Break
13:30 – 14:30	EdgeCom Session 1
14:30 – 15:30	CSCloud Session 2
15:30 – 15:50	Break
15:50 – 16:50	CSCloud Session 3
16:50 – 17:50	EdgeCom Session 2
Sunday, June 27th, 2021	
9:00 – 10:00	CSCloud Session 4
10:00 – 11:00	CSCloud Session 5
11:00 – 12:00	CSCloud Session 6
12:00 –13:00	Break
13:00 –14:00	EdgeCom Session 3
14:00 –15:00	CSCloud Session 7

Registration:

Online Registration System
http://www.cloud-conf.net/cscloud/2021/cscloud/registration.html

Presentation Online Rooms:

Zoom
https://zoom.com.cn/j/81855719458?pwd=dGlqNmVBWkViK3Q4YXdrU2cwbmx5QT09

Important Notice:

Due to the outbreak of COVID-19, this year the IEEE CSCloud/EdgeCom 2021 will be a virtual conference online.
For all participants, please do notice all the time mentioned in this booklet is based on the time zone of east USA which is **Eastern Daylight Time (EDT), UTC -4.**

IEEE CSCloud/EdgeCom 2021 Keynotes

June 26th, 2021, 9:00 AM, Eastern Daylight Time (EDT), UTC -4

Topic: Next to Big Data is Big Knowledge

Prof. Ruqian Lu
Chinese Academy of Sciences, China

Bio: Ruqian Lu is a professor of computer science of the Institute of Mathematics, Academy of Mathematics and Systems Science, at the same time an adjunct professor of Institute of Computing Technology, Chinese Academy of Sciences and Peking University. He is also a fellow of Chinese Academy of Sciences. His research interests include artificial intelligence, knowledge engineering, knowledge-based software engineering, formal semantics of programming languages and quantum information processing. He has published more than 180 papers and 10 books. He has won two first class awards from the Chinese Academy of Sciences and a National second class prize from the Ministry of Science and Technology. He has also won the 2003 Hua Loo-keng Mathematics Prize from the Chinese Mathematics Society and the 2014 lifetime achievements award from the China's Computer Federation.

Abstract: Recently, the topic of mining big data to obtain knowledge (called big data knowledge engineering) has become hot interest of researchers. Also, the concept of big knowledge was coined in this process. The new challenge was to mine big knowledge (not just knowledge) from big data. While researchers have explored the basic characteristics of big data in the past, it seems that very few or even no researcher has tried to approach the task of defining or summarizing the basic characteristics of big knowledge. This talk will first provide a retrospective view on the research of big data knowledge engineering and then introduce formally the big knowledge concept with five major characteristics, both qualitatively and quantitatively. Using these characteristics we investigate six large scaled knowledge engineering projects: the Shanghai project of fifth comprehensive investigation on city's traffic, the Xia-Shang-Zhou chronology project, the Troy city and Trojan War excavation project, the international human genome project, the Wiki-world project and the currently very hot research on knowledge graphs. We show that some of them are big-knowledge projects but some aren't. Based on these discussions, the concept of big-knowledge system will be introduced with additional five characteristics. Also, big-knowledge engineering concepts and their lifecycle models are introduced and discussed. At last, a group of future research problems on big knowledge is proposed.

IEEE CSCloud/EdgeCom 2021 Keynotes

June 26th, 2021, 10:10 AM, Eastern Daylight Time (EDT), UTC -4

Topic: Blockchain-Enabled High-Confidence IoT for Smart X

Prof. Xiuzheng Cheng
Shandong University, China

Bio: Xiuzhen Cheng received her MS and PhD degrees in computer science from the University of Minnesota -- Twin Cities, in 2000 and 2002, respectively. She was a faculty member at the Department of Computer Science, The George Washington University, Washington DC, from September 2002 to August 2020. Currently she is a professor in School of Computer Science and Technology, Shandong University, China. Her research focuses on blockchain computing, intelligent Internet of Things, and wireless and mobile security. She is the founder and steering committee chair of the International Conference on Wireless Algorithms, Systems, and Applications (WASA, launched in 2006); she launched the SDU-Elsevier High-Confidence Computing Journal. She served/is serving on the editorial boards of several technical journals (e.g. IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Wireless Communications, IEEE Wireless Communications Magazine) and the technical program committees of many professional conferences/workshops (e.g. ACM Mobihoc, ACM Mobisys, IEEE INFOCOM, IEEE ICDCS, IEEE ICC, IEEE/ACM IWQoS). She also chaired several international conferences (e.g. ACM Mobihoc'14, IEEE PAC'18). Xiuzhen is a Fellow of IEEE.

Abstract: This talk presents a blockchain-enabled high-confidence IoT architecture to support various smart systems such as smart transportations and smart grids. This architecture relies on blockchain to provide a trustworthy environment for IoT data analysis to make IoT systems secure, reliable, accountable, adaptive, and self-evolving. We intend to answer two critical questions: how to integrate blockchain with IoT and how to extend trust from on-chain to off-chain to support trustable IoT applications. For the first question, we developed BLOWN and wChain, two blockchain systems respectively for single- and multi-hop wireless communications taking into consideration the channel dynamicity caused by adversarial jamming and physical environments. We also proposed CloudChain to take advantage of the benefits brought by shared memory and remote direct memory access in clouds. To extend trust from on-chain to off-chain, we proposed a coin-based accountable IoT access procedure control scheme to make blockchain control the real world in a fine-grained and trustworthy way, and a TEE-based trusted data collecting system to gather off-chain ground truth onto the chain. An in-home cargo delivery case study was developed to demonstrate our design. Finally, we talk about open research challenges to enable high-confidence IoT for Smart X.

Technical Program

The 8th IEEE International Conference on Cyber Security and Cloud Computing (IEEE CSCloud 2021)

CSCloud 1:

26/06/2021, Online Conference

- Mahmudul Hassan Ashik, Tariqul Islam, Kamrul Hasan, and Kiho Lim. A Blockchain-Based Secure Fog-Cloud Architecture for Internet of Things
- Dr. Bharat Rawal and Tarun Sai. No-Sum IPsec Lite: Simplified and lightweight Internet security protocol for IoT devices
- Manoj Muniswamaiah, Tilak Agerwala, and Charles C. Tappert. Fog Computing and the Internet of Things (IoT): A Review
- Aatish Chiniah and Avinash Mungur. Performance Enhancing Secure Erasure Code (PESEC) for Cloud Storage using Random N Blocks Encryption

CSCloud 2:

26/06/2021, Online Conference

- Feiyan Guo, Bing Tang, Mingdong Tang, Hui Zhao and Wei Liang. Microservice Selection in Edge-Cloud Collaborative Environment: A Deep Reinforcement Learning Approach
- Li Zheng, Xu Zhang and Sujuan Zhang. Research on Multi-path Network in Cloud Computing Based on SCTP
- Xinxin Liu, Xien Cheng, Chenyang Liao and Jiaren Chen , Ceramic Anti-counterfeiting Technology Identification Method Based on Blockchain
- Tarik Eltaeib and Nazrul Islam. Taxonomy of Challenges in Cloud Security

CSCloud 3:

26/06/2021, Online Conference

- Zoe L. Jiang, Hui Guo, Yijian Pan, Yang Liu, Xuan Wang and Jun Zhang. Secure Neural Network in Federated Learning with Model Aggregation under Multiple Keys
- Yash Patel, Bharat Rawal, Yunkai Liu and Rahman Tajmilur. Security and privacy challenges in 5G-enabled Technology
- Zijun Xu, Meng Li, Yiming Hei, Peiran Li and Jianwei Liu. A Malicious Android Malware Detection System based on Implicit Relationship Mining
- Shuyu Chen, Wei Li, Jun Liu, Haoyu Jin and Xuehui Yin. Network Intrusion Detection Based on Subspace Clustering and BP Neural Network

CSCloud 4:

26/06/2021, Online Conference

- Angel Vazquez Salazar and Ali Ahmadinia. Partially Homomorphic Encryption Scheme for Real-Time Image Stream
- Md. Ahsan Ayub, Steven Smith, Ambareen Siraj and Paul Tinker. Domain Generating Algorithm based Malicious Domains Detection
- Yang Li, Liyun Bai, Mingqi Zhang, Siyuan Wang, Jing Wu and Hao Jiang. Network Protocol Reverse Parsing Based on Bit Stream
- Xiaoli Wan, Wenli Li, Zhihui Lu, Xiaohua Xuan, Jie Cheng. One WS-Management based CoT System Management Model in Edge Computing Environment

CSCloud 5:

26/06/2021, Online Conference

- Naveen Naik Sapavath, Danda B. Rawat and Eric Muhati. Prediction and Detection of Cyberattacks using AI Model in Virtualized Wireless Networks
- Kong Xiangcong, Zaheng Xiaoying, Zhu Yongxin, Zhang Qinrun and Huang Ying. Custom Computing Design and Implementation for Multiple Dedispersion with GPU
- Yun Su, Zenghui Yang and Naiwang Guo. Research on Load-balance Indexing Algorithm for Smart Grid System
- Xiaoqing Wen, Zhenyu Guan, Dawei Li, Hanzheng Lyu and Huimin. A Blockchain-based Framework for Information Management in Internet of Vehicles

CSCloud 6:

26/06/2021, Online Conference

- Chuang Ma, Sishi Qin, Jinhao Hu and Li Yan. Subway flow prediction based on improved support vector machine
- Qunchao Bi, Taibin Zhou, Dali Xue, Huanhuan Lai, Jiajia Huang, Duxi Zhang, Yinqiang Huang and Bo Li. A Smart and Safe Robot System for Electric Monitoring
- Yizhong Liu, Meikang Qiu, Jianwei Liu, Meiqin Liu， Blockchain-Based Access Control Approaches

CSCloud 7:

26/06/2021, Online Conference

- Ripon Patgiri. Whisper: A Curious Case of Valid and Employed Mallory in Cloud Computing
- Manoj Muniswamaiah, Tilak Agerwala and Charles C. Tappert. A Survey of Cloudlets, Mobile Edge and Fog Computing
- Keith Massey, Nadia Moazen Chaharsoughi and Talal Halabi. Optimizing the Allocation of Secure Fog Resources based on QoS Requirements
- Yuhang Gao, Meikang Qiu, Meiqin Liu，Machine Learning Based Network Censorship

Technical Program

The 7th IEEE International Conference on Edge Computing and Scalable Cloud (IEEE EdgeCom 2021)

EdgeCom 1:

26/06/2021, Online Conference

- Wenxiu Sui, Zhaobin Liu, Haoze Lv, Zhiyang Li and Weijiang Liu. Random Partition Region for Location Privacy Protection on Edge Computing
- Yongqiang Lu, Zhaobin Liu and Yiming Huang. Parameters Compressed Mechanism in Federated Learning for Edge Computing
- Pengcheng Zhou, Yun Liu, Lei Guo, Ningning Lu, Jing Wu and Hao Jiang. Handoff of Satellite Network for High-Speed Mobile Terminals Based on Edge Computing
- Haoqiang Liu, Hongbo Zhao, Liwei Geng, Yujie Wang and Wenquan Feng. A Distributed Dependency-Aware Offloading Scheme for Vehicular Edge Computing Based on Policy Gradient

EdgeCom 2:

26/06/2021, Online Conference

- Bin Zhang, Chong Wang, Yumin Chen, Jian Fu and Yangjun Zhou. An edge data access control scheme suitable for wireless smart grid environment
- Lijun Xiao, Jiahong Cai, Meikang Qiu and Meiqin Liu. A Secure Identity Authentication Protocol for Edge Data in Smart Grid Environment
- Junhai Zhou, Haihan Wu, Yapin Lin, Wei Liang and Qin Liu. Multi-community Opportunistic Routing Algorithm Based on Machine Learning in the Internet of Vehicles
- Liwei Geng, Hongbo Zhao, Haoqiang Liu, Wenquan Feng, Yujie Wang and Lu Bai. Deep Reinforcement Learning-based Computation Offloading in Vehicular Networks

EdgeCom 3:

26/06/2021, Online Conference

- Shaofei Lu, Xiaolin Tang, Yajun Zhu, and Jingke She. A Cloud-Edge Collaborative Intelligent Fault Diagnosis Method Based on LSTM-VAE Hybrid Model
- Jinjing Ma, Yongkang Peng, Yu Nie, Wenfang Cheng, and Meikang Qiu. Identification method of ancient ceramics based on VGG16-GSSVM with few-shot
- Guangxian Lyu, Peng Liu, Yiming Lu, Tianyou Wang, and Xianguo Kang. A Data Middle Platform Architecture Based on Microservice Serving Power Grid Business
- Chuang Ma, Xinting Hu, Shuaiwu Liu, and Lei Liu. Attention Based Multi-Unit Spatial-Temporal Network for Traffic Flow Forecasting