Proposal: The 5th ACM International Symposium on Blockchain and Secure Critical Infrastructure (ACM BSCI 2023)

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

Workshop Title:

The 5th ACM International Symposium on Blockchain and Secure Critical Infrastructure (ACM BSCI 2023)

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

Call for Papers

Blockchain is a decentralized transaction and data management technology that was voiced by its implementation in Bitcoin. In recent years, Blockchain has been achieving an ever-growing popularity, along with the upgrades of networking capacity. The reason for the interest in Blockchain is its central attributes that provide security, anonymity and data integrity without any third-party organization in control of the transactions, and therefore it is applied in numerous fields, including securing critical infrastructure.

As technology advances, critical infrastructures increasingly come to rely on digital control systems and networking. Attacks on critical infrastructure sites are currently a fact of life rather than a potential threat. For example, power stations, chemical plants, telecommunication stations and nuclear facilities have been targeted by cyber criminals, including state-sponsored / affiliated and advanced persistent threat (APT) actors.

How can we utilize blockchain techniques to complement other technologies to secure critical infrastructure?

Existing critical infrastructure security solutions may have limitations, for example due to the centralized setting (e.g., single point of failure). Hence, there have been attempts to explore the utility of blockchain to enhance the reliability and resilience of the critical infrastructure.

The aim of the ACM International Symposium on Blockchain and Secure Critical Infrastructure is to solicit and present state-of-the-art advances in the design and application of blockchain in secure critical infrastructure applications. Specifically,

researchers, experts, and scholars from both industry and academia are strongly encouraged to share their recent studies, investigations, and findings in this forum.

Topics of particular interest include, but are not limited to:

- Blockchain Advances in 6G Network
- Smart Contract Methods in Intelligent Control System
- Technical issues of Blockchain and Secure Critical Infrastructure (architecture, functionality, workflows, availability, scalability, challenges of implementation, etc.)
- Security and Privacy in Blockchain and Critical Infrastructure
- Attacks on Blockchain and Critical Infrastructure
- Blockchain and Secure Critical Infrastructure with Smart Grid
- Blockchain and Secure Critical Infrastructure with Industry 4.0
- Impact on business models (change of existing business models, emergence of new business models, disruptive business models, etc.)
- Blockchain Advance in Secure Smart Grid
- The future applications of Blockchain and Secure Critical Infrastructure in different areas (finance, insurance, healthcare and pharmaceuticals, energy sector, education, transportation, media production, government sector etc.)

In addition to the technical research achievements, all qualified submissions in relevant subtopics (including novel industrial topics) not discussed above are also welcomed. High quality submissions will be recommended to selected journal special issues (information will be provided).

Submission Instruction:

Submitted papers must not substantially overlap papers that have been published or that are simultaneously submitted to a journal or a conference with proceedings. **All submissions should be appropriately anonymized and a DOUBLE-BLIND REVIEW policy will be applied during the review process.** Submissions must be in double-column ACM SIG Proceedings format, and should not exceed the following page limit.

- Full-Length Paper = 12 Page Limit + up to 2 extra pages for appendices only
- Short Paper = 6 Page Limit + up to 2 extra pages for appendices only
- Poster/Late Breaking = 3 Page Limit (for all content, no extra pages)

Position papers describing the work in progress are also welcome. Only pdf files will be accepted. Authors of accepted papers must guarantee that their papers will be presented at the workshop. At least one author of the paper must be registered at the appropriate conference rate. Accepted papers will be published in the ACM Digital Library. This symposium will grant a few awards, including ACM Best Paper Award and ACM Best Student Award.

Paper submission site: EasyChair

Important Dates

Organization Committee

Program Chairs

Keke Gai, Beijing Institute of Technology, China
Kim-Kwang Raymond Choo, University of Texas at San Antonio, USA

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

Summary and Justification

The series of BSCI events aim to provide a symposium for scholars who focus on blockchain technology research, as well as the on-ground application attempts in critical infrastructure field. The BSCI committee is attempting to develop BSCI series academic events to become one of the flagship conferences in blockchain. The committee has successfully held the symposium four times and were held in conjunction with AsiaCCS 2019-2022. The acceptance rates of the symposium were 30% in 2022, 17.65% in 2021, 33% in 2020, and 27% in 2019. We believe that a consistent and persistent BSCI series events will be beneficial for establishing a healthy ecosystem of blockchain in both research and industry fields.

Best Paper Awards

- 2022: "Economic Analysis of Decentralized Exchange Market with Transaction Fee Mining" by Hongbo Zhang (The Chinese University of Hong Kong, Shenzhen, China); Sizheng Fan (The Chinese University of Hong Kong, Shenzhen, Shenzhen, China); Zhixuan Fang (Tsinghua University, Shenzhen, China); Wei Cai (The Chinese University of Hong Kong, Shenzhen, Shenzhen, China)

- 2021: "Eth2Vec: Learning Contract-Wide Code Representations for Vulnerability Detection on Ethereum Smart Contracts" by Nami Ashizawa (Osaka University, Japan); Naoto Yanai (Osaka University, Japan); Jason Paul Cruz (Osaka University, Japan); Shingo Okamura (National Institute of Technology, Japan)

- 2020: "Mining the Characteristics of the Ethereum P2P Network," by Zhenzhen Li, Wei Xia, Mingxin Cui, Fu Peipei, Gaopeng Gou, Gang Xiong (China Institute of Information Engineering, Chinese Academy of Sciences)

- 2019: "Distributed Community Detection over Blockchain Networks Based on Structure Entropy," by Yang Chen, Jiamou Liu (University of Auckland)

Best Student Paper Awards

- 2022: "ScaleSFL: A Sharding Solution for Blockchain-Based Federated Learning" by Evan Madill: University of Manitoba, Canada); Ben Nguyen (University of Manitoba, Canada); Sara Rouhani (University of Manitoba, Canada)

- 2021: "MultiCall: a Transaction-batching Interpreter for Ethereum", by William Hughes (Chalmers University of Technology, Sweden); Gerardo Schneider (University of Gothenburg, Sweden); Alejandro Russo (Chalmers University of Technology, Sweden)

- 2020: "SmartWitness: A Proactive Software Transparency System using Smart Contracts," by Juan Guarnizo (Singapore University of Technology and Design), Bithin Alangot (Amrita Vishwa Vidyapeetham), Pawel Szalachowski (Singapore University of Technology and Design)

- 2019: "Proof-of-Play: A Novel Consensus Model for Blockchain-based Peer-to-Peer Gaming System," by Ho Yin Yuen (Hong Kong Polytechnic University), Feijie Wu (Hong Kong Polytechnic University), Wei Cai (Chinese University of Hong Kong), Henry C.B. Chan (Hong Kong Polytechnic University), Qiao Yan (Shenzhen University), Victor C.M. Leung (Shenzhen University)

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

Proposed Length, Format, and Agenda

ACM BSCI 2023 will be a full day event, which consists of four full paper sessions and one short paper/ poster session. Each session has 4-5 papers. Paper formats will follow the requirement of ACM proceedings as required by AsiaCCS 2023.

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

Expected number of submissions and acceptance rate

Expected number of submissions: 60

Expected acceptance rate: 28%

Expected number of attendees: 60

*** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

Program Chairs and Tentative Program Committee

Program Chairs
Keke Gai, Beijing Institute of Technology, China
Kim-Kwang Raymond Choo, University of Texas at San Antonio, USA

Publicity Chair
Jiamou Liu, The University of Auckland, New Zealand

Tentative Program Committee *(to be expanded)*
Yonghao Wang, Birmingham City University, UK
Ding Wang, Peking University, China
Tianwei Zhang, Amazon, USA
Xuyun Zhang, Macquarie University, Australia
John Grant, Nine Tiles Cambridge, UK
Ralph Deters, University of Saskatchewan, Canada
Cheng Zhang, Waseda University, Japan
Paul Kearney, Birmingham City University, UK
Mak Sharma, Birmingham City University, UK
Zengpeng Li, Lancaster University, UK
Zijian Zhang, Beijing Institute of Technology, China
Xiaoyang Liu, Columbia University, USA
Shaojing Fu, National University of Defense Technology, China
Jian Shen, Nanjing University of Information Science and Technology, China
Hao Wang, Shandong Normal University, China
Junwei Zhang, Xidian University, China
Xinghua Li, Xidian University, China
Vitor Jesus, Birmingham City University, UK
Shuo Wang, Birmingham City University, UK
Hao Tang, City University of New York, USA
Xiong Li, Hunan University of Science and Technology, China
Shishank Shishank, Birmingham City University, UK
Yunxia Liu, Zhengzhou Normal University,China
Qi Jiang, Xidian University, China
Wenbo Shi, Northeastern University, China
Ning Lu, Northeastern University, China
Han Qiu, Telecom-ParisTech, France
Hua Yin, Duke University, USA
Ke Miao, Mitacs Inc., Canada
Md Liakat Ali, Rider University, USA

Ruoyu Chen, Beijing Information Science and Technology University, China
Wei Cai, The Chinese University of Hong Kong, Shenzhen, China
Abdelaziz Bouras, Professor, Qatar University, Qatar
Wu Chen, Southwest University, China
Bo Tang, Mississippi State University, USA
Yuanxiong Guo, University of Texas at San Antonio, USA

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

Organizers' Bios

KEKE GAI received a Ph.D. degree in Computer Science from the Department of Computer Science at Pace University, New York, USA. He also holds degrees from Nanjing University of Science and Technology (BEng), The University of British Columbia (MET) and Lawrence Technological University (MBA and MS). He is currently an Associate Professor in the School of Computer Science and Technology at Beijing Institute of Technology, Beijing, China. Keke Gai has published more than 130 refereed journals or conference papers, including 8 ESI high cited papers (2019). He has been granted 6 Best Paper Awards (ICA3PP'20, IEEE TrustCom'18, IEEE HPCC'18, IEEE SSC'16, IEEE CSCloud'15, IEEE BigDataSecurity'15) and 2 Best Student Paper Awards (IEEE HPCC'16, IEEE SmartCloud'16) in recent years. His paper about edge computing has been named as the "Best Research Paper of 2018" by Journal of Network and Computer Applications. His cited counts reached more than 8000 as of September 2022 (according to Google Scholar). He is serving as Associated Editors in a few decent journals, including IEEE TDSC, JPDC, etc, has served as a reviewer for top SCI journals, e.g., TECS, TII, TSC, TCC, TVT, TKDE, TETC, TASE, TEM, etc. He is involved in a number of academic associations, e.g., ACM, IEEE and CCF. His research interests include blockchain, cybersecurity, cloud computing, and edge computing. He has worked as program chairs in a few academic conferences, including BSCI 2020, 2019, EdgeBlock 2020, EUC 2019, EdgeCom 2019, 2018, SmartCom 2018, etc. He is a general secretary of AEEEIT Blockchain Committee, a standing committee member of CCF TCBC, and a general secretary of IEEE Smart Computing STC. He has worked for Fortune 500 enterprises, including SINOPEC and GE Capital. He is a Senior Member of IEEE.

KIM-KWANG RAYMOND CHOO received the Ph.D. in Information Security in 2006 from Queensland University of Technology, Australia. He currently holds the Cloud Technology Endowed Professorship at The University of Texas at San Antonio (UTSA). He serves as the *Associate Editor-in-Chief* of Human-centric Computing and Information Sciences; Department Editor of IEEE Transactions on Engineering Management; *Associate Editor* of Computers & Electrical Engineering, Data & Knowledge Engineering, Digital Communications and Networks, IEEE Access, and IEEE Transactions on Big Data; *Associate Technical Editor* of IEEE Communications Magazine; *Technical Editor* of IEEE Network Magazine; Editor of Future Generation Computer Systems; and on the *editorial board* of Computers & Security, Cluster

Computing, Electronic Commerce Research, IEEE Blockchain Technical Briefs, IEEE Internet of Things Journal, and Journal of Network and Computer Applications.