# Zhe PENG

Research Assistant Professor
Department of Industrial and Systems Engineering
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## EDUCATION

**The Hong Kong Polytechnic University**, Hong Kong                Jul. 2014 - Sep. 2018
*Ph.D. in Computer Science*
**Supervisor**: Prof. Bin Xiao

**University of Science and Technology of China**, Hefei, China                Sep. 2010 - Jul. 2013
*M.E. in Information and Communication Engineering*

**Northwestern Polytechnical University**, Xi'an, China                Sep. 2006 - Jul. 2010
*B.E. in Communication Engineering*

## RESEARCH INTERESTS

Blockchain, Artificial Intelligence of Things, Data Security and Privacy

## WORK EXPERIENCE

**The Hong Kong Polytechnic University**, Hong Kong                Jun. 2023 - Present
*Research Assistant Professor, Department of Industrial and Systems Engineering*

**Hong Kong Baptist University**, Hong Kong                Jan. 2020 - Jun. 2023
*Research Assistant Professor, Department of Computer Science*
*R&D Manager, Blockchain and FinTech Lab*

**SF Technology**, Shenzhen, China                Oct. 2018 - Dec. 2019
*Blockchain Technical Director, Big Data and Blockchain R&D Center*

**Stony Brook University**, New York, USA                Sept. 2017 - Feb. 2018
*Visiting Scholar, Department of Electrical and Computer Engineering*
**Supervisor**: Distinguished Prof. Yuanyuan Yang (IEEE Fellow)

**TP-LINK**, Shenzhen, China                Jul. 2013 - Jun. 2014
*Software Engineer*

## PUBLICATIONS

**Journal Papers**

1. Shang Gao, **Zhe Peng**, Feng Tan, Yuanqing Zheng, and Bin Xiao, "SymmeProof: Compact Zero-Knowledge Argument for Blockchain Confidential Transactions", *IEEE Transactions on Dependable and Secure Computing (**TDSC**)*, Vol. 20, No. 3, pp. 2289-2301, 2023. (IF: 7.3, JCR Q1)

2. Yue Teng, Clyde Zhengdao Li, Geoffrey Q.P. Shen, Qianwen Yang, and **Zhe Peng**, "The Impact of Life Cycle Assessment Database Selection on Embodied Carbon Estimation of Buildings", *Building and Environment*, Vol. 243, pp. 110648, 2023. (IF: 7.4, JCR Q1)

3. **Zhe Peng**, Jianliang Xu, Haibo Hu, and Lei Chen, "BlockShare: A Blockchain Empowered System for Privacy-Preserving Verifiable Data Sharing", *IEEE Data Engineering Bulletin*, 2022.

4. Haotian Wu, **Zhe Peng**, Songtao Guo, Yuanyuan Yang, and Bin Xiao, "VQL: Efficient and Verifiable Cloud Query Services for Blockchain Systems", *IEEE Transactions on Parallel and Distributed Systems (**TPDS**)*, Vol. 33, No. 6, pp. 1393-1406, 2022. (IF: 5.3, JCR Q1)

5. **Zhe Peng**, Jianliang Xu, Xiaowen Chu, Shang Gao, Yuan Yao, Rong Gu, and Yuzhe Tang, "VFChain: Enabling Verifiable and Auditable Federated Learning via Blockchain Systems", *IEEE Transactions on Network Science and Engineering (**TNSE**)*, Vol. 9, No. 1, pp. 173-186, 2022. (IF: 6.6, JCR Q1)

6. Zhen Chen, Chen Yang, Meilu Zhu, **Zhe Peng**, and Yixuan Yuan, "Personalized Retrogress-Resilient Federated Learning towards Imbalanced Medical Data", *IEEE Transactions on Medical Imaging (**TMI**)*, Vol. 41, No. 12, pp. 3663 3674, 2022. (IF: 11.037, JCR Q1)

7. Zecheng Li, Shang Gao, **Zhe Peng**, Bin Xiao, Songtao Guo, and Yuanyuan Yang, "B-DNS: A Secure and Efficient DNS Based on the Blockchain Technology", *IEEE Transactions on Network Science and Engineering (**TNSE**)*, Vol. 8, No. 2, pp. 1674-1686, 2021. (IF: 6.6, JCR Q1)

8. Yuan Yao, Bin Xiao, Wen Wang, Gang Yang, Xingshe Zhou, and **Zhe Peng**, "Real-Time Cache-Aided Route Planning based on Mobile Edge Computing", *IEEE Wireless Communications*, Vol. 27, No. 5, pp. 155-161, 2020. (IF: 11.979, JCR Q1)

9. Shang Gao, **Zhe Peng**, Bin Xiao, Aiqun Hu, Yubo Song, and Kui Ren, "Detection and Mitigation of DoS Attacks in Software Defined Networks", *IEEE/ACM Transactions on Networking (**ToN**)*, Vol. 28, No. 3, pp. 1419-1433, 2020. (IF: 3.597, JCR Q1)

10. **Zhe Peng**, Yuan Yao, Bin Xiao, Songtao Guo, and Yuanyuan Yang, "When Urban Safety Index Inference Meets Location-based Data", *IEEE Transactions on Mobile Computing (**TMC**)*, Vol. 18, No. 11, pp. 2701-2713, 2019. (IF: 4.098, JCR Q1)

11. **Zhe Peng**, Shang Gao, Zecheng Li, Bin Xiao, and Yi Qian, "Vehicle Safety Improvement through Deep Learning and Mobile Sensing", *IEEE Network*, Vol. 32, No. 4, pp. 28-33, 2018. (IF: 7.197, JCR Q1)

12. **Zhe Peng**, Shang Gao, Bin Xiao, Songtao Guo, and Yuanyuan Yang, "CrowdGIS: Updating Digital Maps via Mobile Crowdsensing", *IEEE Transactions on Automation Science and Engineering (**TASE**)*, Vol. 15, No. 1, pp. 369-380, 2018. (IF: 5.224, JCR Q1)

13. **Zhe Peng**, Shang Gao, Bin Xiao, Guiyi Wei, Songtao Guo, and Yuanyuan Yang, "Indoor Floor Plan Construction through Sensing Data Collected from Smartphones", *IEEE Internet of Things Journal (**IoTJ**)*, Vol. 5, No. 6, pp. 4351-4364, 2018. (IF: 5.863, JCR Q1)

14. Yuan Yao, **Zhe Peng**, and Bin Xiao, "Parallel Hyper-Heuristic Algorithm for Multi-objective Route Planning in a Smart City", *IEEE Transactions on Vehicular Technology (**TVT**)*, Vol. 67, No. 11, pp. 10307-10318, 2018. (IF: 4.432, JCR Q1)

15. Jiwei Li, **Zhe Peng**, Shang Gao, Bin Xiao, and Henry Chan, "Smartphone-Assisted Energy Efficient Data Communication for Wearable Devices", *Computer Communications*, Vol. 105, pp. 33-43, 2017. (IF: 2.613, JCR Q2)

16. **Zhe Peng**, Hancheng Lu, and Peilin Hong, "On Optimal Power Allocation Scheme for Delay-Constrained Communication", *Journal of University of Chinese Academy of Sciences*, 2013.

**Conference Papers**

1. **Zhe Peng**, Songlin Hou, and Yixuan Yuan, "EPAR: An Efficient and Privacy-Aware Augmented Reality Framework for Indoor Location-Based Services", in *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS '22**)*, Kyoto, Japan, 2022.

2. Haixin Wang, Cheng Xu, Ce Zhang, Jianliang Xu, **Zhe Peng**, and Jian Pei, "vChain+: Optimizing Verifiable Blockchain Boolean Range Queries", in *Proc. of the IEEE International Conference on Data Engineering (**ICDE '22**)*, Kuala Lumpur, Malaysia, 2022.

3. **Zhe Peng**, Cheng Xu, Haixin Wang, Jinbin Huang, Jianliang Xu, and Xiaowen Chu, "P$^2$B-Trace: Privacy-Preserving Blockchain-based Contact Tracing to Combat Pandemics", in *Proc. of the ACM SIGMOD International Conference on Management of Data (**SIGMOD '21**)*, Xi'an, Shaanxi, China, 2021.

4. **Zhe Peng**, Jinbin Huang, Haixin Wang, Shihao Wang, Xiaowen Chu, Xinzhi Zhang, Li Chen, Xin Huang, Xiaoyi Fu, Yike Guo, and Jianliang Xu, "BU-Trace: A Permissionless Mobile System for Privacy-Preserving Intelligent Contact Tracing", in *Proc. of the International Workshop on Mobile Ubiquitous Systems and Technologies (**MUST '21**)*, Taipei, Taiwan, 2021. (**Best Paper Award**)

5. **Zhe Peng**, Haotian Wu, Bin Xiao, and Songtao Guo, "VQL: Providing Query Efficiency and Data Authenticity in Blockchain Systems", in *Proc. of the IEEE International Conference on Data Engineering (**ICDE '19**)*, Macau SAR, China, 2019.

6. Shang Gao, Zecheng Li, **Zhe Peng**, and Bin Xiao, "Power Adjusting and Bribery Racing: Novel Mining Attacks in the Bitcoin System", in *Proc. of the ACM SIGSAC Conference on Computer and Communications Security (**CCS '19**)*, London, UK, 2019.

7. Jiwei Li, **Zhe Peng**, and Bin Xiao, "New Mobility-aware Application Offloading Design with Low Delay and Energy Efficiency", in *Proc. of the IEEE International Conference on Communications (**ICC '18**)*, Kansas City, MO, USA, 2018.

8. **Zhe Peng**, Bin Xiao, Yuan Yao, Jichang Guan, and Fan Yang, "U-Safety: Urban Safety Analysis in a Smart City", in *Proc. of the IEEE International Conference on Communications (**ICC '17**)*, Paris, France, 2017.

9. Yuan Yao, **Zhe Peng**, Bin Xiao, and Jichang Guan, "An Efficient Learning-based Approach to Multi-objective Route Planning in a Smart City", in *Proc. of the IEEE International Conference on Communications (**ICC '17**)*, Paris, France, 2017.

10. Shang Gao, **Zhe Peng**, Bin Xiao, Aiqun Hu, and Kui Ren, "FloodDefender: Protecting Data and Control Plane Resources under SDN-aimed DoS Attacks", in *Proc. of the IEEE International Conference on Computer Communications (**INFOCOM '17**)*, Atlanta, GA, USA, 2017.

11. Shang Gao, **Zhe Peng**, Bin Xiao, Qingjun Xiao, and Yubo Song, "SCoP: Smartphone Energy Saving by Merging Push Services in Fog Computing", in *Proc. of the IEEE/ACM International Symposium on Quality of Service (**IWQoS '17**)*, Barcelona, Spain, 2017.

12. Shang Gao, **Zhe Peng**, Bin Xiao, and Yubo Song, "Secure and Energy Efficient Prefetching Design for Smartphones", in *Proc. of the IEEE International Conference on Communications (**ICC '16**)*, Kuala Lumpur, Malaysia, 2016.

13. Jiwei Li, **Zhe Peng**, and Bin Xiao, "Smartphone-Assisted Smooth Live Video Broadcast on Wearable Cameras", in *Proc. of the IEEE/ACM International Symposium on Quality of Service (**IWQoS '16**)*, Beijing, China, 2016.

14. Jiwei Li, **Zhe Peng**, Bin Xiao, and Yu Hua, "Make Smartphones Last A Day: Pre-processing Based Computer Vision Application Offloading", in *Proc. of the IEEE International Conference on Sensing, Communication and Networking (**SECON '15**)*, Seattle, WA, USA, 2015.

### Patents

1. **Zhe Peng** and Jianliang Xu, "Method and Apparatus for Blockchain-based Federated Learning", CN115392475A, 2022.

2. **Zhe Peng**, Xiaolong Yao, et al, "Method and Apparatus for Data Storage and Authentication", CN110287724B, 2021.

3. **Zhe Peng** and Bin Xiao, "Method and Apparatus for Indoor Localization Based on Virtual Landmarks", CN105635956B, 2019.

4. **Zhe Peng** and Bin Xiao, "Method and Apparatus for Real-time Queuing Time Estimation in Customs Clearance", CN105632003B, 2018.

## PROFESSIONAL ACTIVITIES

### Invited Talks
- "Data-Driven Cyber-Physical Systems: Methods, Applications and Beyond", PolyU, 2022
- "Innovation - Answer to Emerging Opportunities?", Asian Logistics and Maritime Conference (ALMC), HKTDC & HKSAR, 2019
- "Data Engineering in Mobile Sensing and Blockchain", HKBU, 2019
- "Blockchain Applications for Smart Supply Chain", IEEE MDM Workshop on Blockchain and Mobile Applications (BlockApp), 2019
- "Blockchain Applications in Smart Supply Chain", GS1 Hong Kong IoT Conference, 2019

### Journal Editorship
- Guest Editor, IET Blockchain, 2022 -
- Guest Editor, Electronics, 2023 -
- Guest Editor, Big Data and Cognitive Computing, 2023 -

### Conference TPC Member
- IEEE ICDE Workshop on Blockchain and Data Management (BlockDM), 2021
- IEEE ICNP Workshop on Blockchain and Mobile Applications (BlockApp), 2021
- IEEE ICDCS Workshop on Blockchain and Mobile Applications (BlockApp), 2020
- BenchCouncil International Symposium on Block Chain (BChain), 2020

### Technical Reviewer
- ACM Computing Surveys (CSUR)
- IEEE Transactions on Computers (TC)
- IEEE Transactions on Big Data (TBD)
- IEEE Transactions on Cloud Computing (TCC)
- IEEE Transactions on Mobile Computing (TMC)
- IEEE Transactions on Industrial Informatics (TII)
- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- IEEE Transactions on Dependable and Secure Computing (TDSC)
- IEEE Transactions on Intelligent Transportation Systems (TITS)
- IEEE Transactions on Network Science and Engineering (TNSE)
- IEEE Transactions on Network and Service Management (TNSM)
- IEEE Transactions on Computational Social Systems (TCSS)
- IEEE Transactions on Green Communications and Networking (TGCN)
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS)

- IEEE Internet of Things Journal (IoTJ)
- IEEE Network
- IEEE International Conference on Data Engineering (ICDE)
- International Conference on Very Large Data Bases (VLDB)
- IEEE International Conference on Computer Communications (INFOCOM)
- IEEE International Conference on Distributed Computing Systems (ICDCS)
- IEEE International Conference on Parallel and Distributed Systems (ICPADS)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- IEEE International Conference on Sensing, Communication and Networking (SECON)
- IEEE International Conference on High Performance Computing and Communications (HPCC)

## TEACHING EXPERIENCES

**ISE2001 Introduction to Enterprise Computing**                    Spring 2024
- *Course Leader, PolyU*

**COMP7200 Blockchain Technology**                              Spring 2020 - 2023
- *Course Leader, HKBU*

**COMP4137 Blockchain Technology and Applications**            Spring 2022 - 2023
- *Course Leader, HKBU*

**COMP4087 Selected Topics in Web Technology and Data Engineering**      Spring 2021
- *Course Leader, HKBU*

**COMP2865 Fundamental of Data Analysis and Management**              Fall 2021
- *Course Leader, HKBU*

**COMP5527 Mobile Computing and Data Management**                  Spring 2017
- *Teaching Assistant, PolyU*

**COMP2322 Computer Networking**                                Spring 2016
- *Teaching Assistant, PolyU*

**COMP2012 Discrete Mathematics**                               Spring 2015
- *Teaching Assistant, PolyU*

**COMP437 Mobile Computing**                              Spring 2014, Fall 2016
- *Teaching Assistant, PolyU*

## SELECTED AWARDS

- THE Awards Asia–Technological or Digital Innovation of the Year          2021
- Best Paper Award at MUST'21                                       2021
- High-Value Case Award at Trusted Blockchain Summit                   2019
- Overseas High-Caliber Personnel Award (Peacock Talent Plan), Shenzhen    2019
- First Prize in COMP Research Competition, PolyU                        2017
- Postgraduate Scholarship, PolyU                               2014 - 2017
- First-Class Postgraduate Scholarship, USTC                        2010 - 2012
- Excellent Graduation Thesis, NPU                                    2010
- First Prize in China Undergraduate Mathematical Contest in Modeling        2008
- Excellent Student Award, NPU                                  2007 - 2009