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 (IEEE Fellow)

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

Intelligent Supply Chain and Logistics, Industrial Blockchain, Autonomous Systems

RESEARCH EXPERIENCES

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)

HONORS & AWARDS

- **World's Top 2% Scientists by Stanford University**   2024
- **ESI Highly Cited Paper**   2023
- **Nomination for THE Awards Asia - Technological or Digital Innovation of the Year**, Times Higher Education (Top 3%)   2021
- **DASFAA-MUST Best Paper Award** (Top 3%)   2021
- **High-Value Case Award**, Trusted Blockchain Summit (Top 3%)   2019
- **Overseas High-Caliber Personnel (Peacock Talent) Award**, Shenzhen   2019
- **First Prize in COMP Research Competition**, PolyU (Top 1%)   2017
- **Postgraduate Scholarship**, PolyU   2014 - 2018

- **First-Class Postgraduate Scholarship**, USTC   2010 - 2012
- **Outstanding Diploma Thesis Award**, NPU (Top 5%)   2010
- **First Prize in China Undergraduate Mathematical Contest in Modeling (CUMCM)**, China Ministry of Education (Top 1%)   2008
- **First-Class Student Award**, NPU   2007 - 2009

PUBLICATIONS

Refereed Papers (including 16 JCR Q1, 11 PolyU COMP-A, 3 PolyU COMP-B)

36. Chenhao Lin, Xiang Ji, Yulong Yang, Qian Li, Zhengyu Zhao, **Zhe Peng**, Run Wang, Liming Fang, Chao Shen, "Hard Adversarial Example Mining for Improving Robust Fairness", *IEEE Transactions on Information Forensics and Security (**TIFS**)*, 2024. (IF: 6.3, JCR Q1, PolyU COMP-A)

35. Yu Li, Yueheng Lu, Xinyu Yang, and **Zhe Peng***, "Blockchain-Empowered Multi-skilled Crowdsourcing for Mobile Web 3.0", *Computer Communications*, Nov. 2024. (IF: 4.5, JCR Q1)

34. **Zhe Peng**, Jiamin Deng, Shang Gao, Helei Cui, and Bin Xiao, "vDID: Blockchain-Enabled Verifiable Decentralized Identity Management for Web 3.0", in *Proc. of the IEEE/ACM International Symposium on Quality of Service (**IWQoS '24**)*, Guangzhou, China, 2024.

33. Baiqing Wang, Tao Xing, Xiaoning Liu, **Zhe Peng**, and Helei Cui, "Lightweight Multimodal Defect Detection at the Edge via Cross-Modal Distillation", in *Proc. of the IEEE/ACM International Symposium on Quality of Service (**IWQoS '24**)*, Guangzhou, China, 2024.

32. Jiawei Sheng, Jiamin Deng, Shang Gao, Huawei Huang, and **Zhe Peng***, "Authenticated Decentralized Identifier Retrieval for Blockchain-based Web 3.0", in *Proc. of the IEEE Global Communications Conference (**GLOBECOM '24**)*, Cape Town, South Africa, 2024.

31. Chen Qiu, Jiamin Deng, Tao Peng, and **Zhe Peng***, "Blockchain-based Verifiable Decentralized Identities for Cyber-Physical Web 3.0", in *Proc. of the IEEE International Conference on Automation in Manufacturing, Transportation and Logistics (**ICaMaL '24**)*, Hong Kong, China, 2024.

30. 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, May 2023. (IF: 7.3, JCR Q1, PolyU COMP-A)

29. 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, Sep. 2023. (IF: 7.4, JCR Q1)

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

27. 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, June 2022. (IF: 5.3, JCR Q1, PolyU COMP-A)

26. **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, Jan. 2022. (IF: 6.6, JCR Q1, **ESI Highly Cited Paper**)

25. 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, Dec. 2022. (IF: 11.037, JCR Q1, PolyU COMP-A)

24. **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.

23. 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. (PolyU COMP-A)

22. 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, Apr. 2021. (IF: 6.6, JCR Q1)

21. **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. (PolyU COMP-A)

20. **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 Conference on Database Systems for Advanced Applications (DASFAA '21) Workshops*, Taipei, Taiwan, 2021. (**Best Paper Award**)

19. 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, Oct. 2020. (IF: 11.979, JCR Q1)

18. 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, June 2020. (IF: 3.560, JCR Q1, PolyU COMP-A)

17. **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, Nov. 2019. (IF: 5.112, JCR Q1, PolyU COMP-A)

16. **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, China, 2019. (PolyU COMP-A)

15. 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. (PolyU COMP-A)

14. **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, July 2018. (IF: 7.197, JCR Q1, PolyU COMP-B)

13. **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, Jan. 2018. (IF: 5.224, JCR Q1)

12. **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, Dec. 2018. (IF: 5.863, JCR Q1, PolyU COMP-B)

11. 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, Nov. 2018. (IF: 4.432, JCR Q1, PolyU COMP-B)

10. 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.

9. 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, June 2017. (IF: 2.613, JCR Q1)

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.

7. 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.

6. 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. (PolyU COMP-A)

5. 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.

4. 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.

3. 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.

2. 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.

1. **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.

Patents

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

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

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

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

PROFESSIONAL ACTIVITIES

Invited Talks
- "Trustworthy Data Management and Analytics", AVSECO, 2024
- "Data-Driven Cyber-Physical Systems", IEEE Technical Committee Workshop on Digital Manufacturing and Human-centered Automation, 2024
- "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
- Associate Editor, IET Blockchain, 2022 -
- Guest Editor, Computer Communications (JCR Q1), 2024 -
- Guest Editor, Electronics, 2024 -
- Guest Editor, Big Data and Cognitive Computing, 2023 -

Conference Organization
- Session Chair, "QoS II", IEEE/ACM International Symposium on Quality of Service (IWQoS), Guangzhou, China, 2024
- Session Chair, "Blockchain-Empowered Industrial Web 3.0", IEEE International Conference on Automation Science and Engineering (CASE), Bari, Italy, 2024
- Organizing Committee Member, 2024 Annual International Conference for Chinese Scholars in Industrial Engineering (CSIE2024) & the 14th Forum for the Council of Chinese Industrial Engineering and Logistics Management Department Heads (CIEDH2024), Hong Kong, 2024

Conference Technical Program Committee (TPC) Member
- IEEE/ACM International Symposium on Quality of Service (IWQoS), 2024
- IEEE International Conference on Trust, Security and Privacy in Computing and Communications (TrustCom), 2024
- IEEE International Conference on Ubiquitous Intelligence and Computing (UIC), 2024
- 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 Information Forensics and Security (TIFS)
- 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
- International Conference on Very Large Data Bases (VLDB)
- IEEE International Conference on Data Engineering (ICDE)
- 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/ACM International Symposium on Quality of Service (IWQoS)

TEACHING EXPERIENCES

Course Leader

- ISE5333 Industrial Blockchain and Applications, PolyU   Spring 2025
- ISE5331 Optimization and Data Analytics for Industry 4.0, PolyU   Fall 2024
- ISE2001 Introduction to Enterprise Computing, PolyU   Spring 2024
- COMP4137 Blockchain Technology and Applications, HKBU   Spring 2022 - 2023
- COMP7200 Blockchain Technology, HKBU   Spring 2020 - 2023
- COMP2865 Fundamental of Data Analysis and Management, HKBU   Fall 2021
- COMP4087 Selected Topics in Web Technology and Data Engineering, HKBU   Spring 2021

Teaching Assistant

- COMP5527 Mobile Computing and Data Management, PolyU   Spring 2017
- COMP2322 Computer Networking, PolyU   Spring 2016
- COMP2012 Discrete Mathematics, PolyU   Spring 2015
- COMP437 Mobile Computing, PolyU   Spring 2014, Fall 2016