

Haibo Cheng

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Education and Employment

- 2023.7–Present **Assistant Research Professor**, *Peking University*, National Engineering Research Center for Software Engineering; Key Laboratory of High Confidence Software Technologies, Ministry of Education.
- 2021.7–2023.6 **Boya Postdoctoral Fellow**, *School of Computer Science, Peking University*, Advisor: Prof. Ping Wang.
- 2015.9–2021.6 **Ph.D. in Computer Science**, *School of Electronics Engineering and Computer Science, Peking University*, Advisor: Prof. Ping Wang.
- 2011.9–2015.6 **M.S. in Pure Mathematics**, *School of Mathematical Sciences, Peking University*, Advisor: Prof. Rongquan Feng.
- 2007.9–2011.6 **B.S. in Pure Mathematics**, *School of Mathematical Sciences, Nankai University*.

Professional Summary

- Research:** My research lies in cryptography and information security, with a focus on honey encryption and authentication. I have published more than 20 papers, including five as first or corresponding author in CCF Rank A venues and nine in CCF Rank B venues. My work has received more than 1,200 citations on Google Scholar. I have served as principal investigator of a Young Scientists Fund project of the National Natural Science Foundation of China (NSFC) and a Special Grant from the China Postdoctoral Science Foundation (awarded to 800 researchers annually). I was also selected for the Peking University Boya Postdoctoral Fellowship (awarded to 200 researchers annually) and have contributed to several National Key R&D Program and NSFC projects.
- Teaching and Mentoring:** I contribute to the course *Frontiers of Software Engineering*. I received the Outstanding Teaching Assistant Award for the Fang Class Seminar organized by Academician Binxing Fang. I have co-supervised three Ph.D. students and eleven master's students (six graduated), and supervised ten undergraduate thesis students (six graduated). I also mentored master's student Fugeng Huang, who won second prize in the Second Chinese Frame Semantic Parsing Evaluation at the 23rd China National Conference on Computational Linguistics (CCL 2024).
- Academic Service:** I serve as a Guest Editor for *Electronics*; a reviewer for *IEEE Transactions on Dependable and Secure Computing*, *IEEE Transactions on Information Forensics and Security*, *PLOS ONE*, *IEEE Systems Journal*, and the *International Journal of Information Security*; and a program committee member for IJCNN 2025, ICASSP 2025, EAI SecureComm 2022, and TrustCom 2020.

Research Projects

- 2023.01–2024.12 **Principal Investigator, NSFC Young Scientists Fund, No. 62202012**, *Research on Adaptive Honeyword Mechanisms*, CNY 200,000.
- 2022.09–2023.06 **Principal Investigator, Special Grant from the China Postdoctoral Science Foundation, No. 2022T150013**, *Research on Adaptive Honeyword Generation Algorithms*, CNY 180,000; 800 awardees nationwide per year.
- 2021.07–2023.06 **Peking University Boya Postdoctoral Fellowship**, *Honeyword-Based Credential-Leak Detection Mechanisms*.
- 2025.01–2026.07 **Participant, University–Industry Collaborative Project**, *Intrinsic Security Analysis and Resilience Enhancement Technologies for Train Control Systems*, CNY 800,000.
- 2021.01–2024.12 **Participant, NSFC General Program, No. 62072010**, *Leakage-Resilient Authentication Protocols Based on Honeywords*, CNY 570,000.
- 2021.01–2024.12 **Participant, NSFC General Program, No. 62072006**, *Proactive Fault Diagnosis for Microservice Architectures*, CNY 570,000.
- 2020.11–2025.06 **Participant, National Key R&D Program of China, No. 2020YFB1805400**, *Novel Network Architectures and Key Technologies Supported by Intrinsic Security*, CNY 25.73 million.
- 2017–2020 **Participant, National Key R&D Program of China, No. 2017YFB1200700**, *Coordinated Transportation and Service Systems for Regional Rail Transit*, CNY 38.70 million.
- 2016–2019 **Participant, National Key R&D Program of China, No. 2016YFB0800603**, *Fundamental Research on Protecting Digital Virtual Assets in Cyberspace*, CNY 14.00 million.
- 2015–2018 **Participant, NSFC General Program, No. 61472016**, *Anonymous Multi-Factor Authentication Protocols for Cloud Computing*, CNY 820,000.

Publications

1. Pengcheng Su, **Haibo Cheng (corresponding author)**, Ping Wang. “*Decomposition-Based Optimal Bounds for Privacy Amplification via Shuffling*.” IEEE Symposium on Security and Privacy (S&P), 2026 (**CCF Rank A conference**; acceptance rate: 254/1995 $\approx$ 13%).
2. Pengcheng Su, **Haibo Cheng (corresponding author)**, Ping Wang. “*Bayesian Advantage of Re-Identification Attack in the Shuffle Model*.” IEEE Computer Security Foundations Symposium (CSF), 2026 (CCF Rank B conference).
3. **Haibo Cheng**, Fugeng Huang, Jiahong Yang, Wenting Li, Ping Wang. “*Practically Secure Honey Password Vaults: New Design and New Evaluation against Online Guessing*.” USENIX Security, 2025 (**CCF Rank A conference**; acceptance rate: 407/2385 $\approx$ 17%).
4. Wenting Li, **Haibo Cheng (corresponding author)**, Kaitai Liang. “*User-Autonomous Multi-Factor Authentication Supporting Arbitrary Factor Configurations*.” IEEE Transactions on Information Forensics and Security, 2025 (**CCF Rank A and CAS Q1 journal**; IF: 6.013).
5. Fugeng Huang, Jiahong Yang, **Haibo Cheng (corresponding author)**, Wenting Li, Ping Wang. “*Personalized Password Guessing via Modeling Multiple Leaked Credentials of the Same User*.” ESORICS, 2025 (CCF Rank B conference).
6. **Haibo Cheng**, Wenting Li, Ping Wang, Chao-Hsien Chu, Kaitai Liang. “*Incrementally Updateable Honey Password Vaults*.” USENIX Security, 2021 (**CCF Rank A conference**; acceptance rate:

246/1316 $\approx$ 19%).

7. **Haibo Cheng**, Zhixiong Zheng, Wenting Li, Ping Wang, Chao-Hsien Chu. “*Probability Model Transforming Encoders Against Encoding Attacks.*” USENIX Security, 2019 (**CCF Rank A conference**; acceptance rate: 113/697 $\approx$ 16%).
8. Wenting Li, **Haibo Cheng**, Ping Wang, Kaitai Liang. “*Practical Threshold Multi-Factor Authentication.*” *IEEE Transactions on Information Forensics and Security*, 2021 (**CCF Rank A and CAS Q1 journal**; IF: 6.013).
9. **Haibo Cheng**, Wenting Li, Ping Wang, Kaitai Liang. “*Improved Probabilistic Context-free Grammars for Passwords Using Word Extraction.*” ICASSP, 2021 (CCF Rank B conference).
10. Ding Wang, **Haibo Cheng**, Ping Wang, Jeff Yan, Xinyi Huang. “*A Security Analysis of Honeywords.*” NDSS, 2018 (**CCF Rank A conference**; acceptance rate: 71/331 $\approx$ 21%).
11. Ding Wang, **Haibo Cheng**, Ping Wang, Xinyi Huang, Gaopeng Jian. “*Zipf’s Law in Passwords.*” *IEEE Transactions on Information Forensics and Security*, 2017 (**CCF Rank A and CAS Q1 journal**; IF: 6.013; **ESI Highly Cited Paper**).
12. Ding Wang, Debiao He, **Haibo Cheng**, Ping Wang. “*fuzzyPSM: A New Password Strength Meter Using Fuzzy Probabilistic Context-Free Grammars.*” IEEE/IFIP DSN, 2016 (CCF Rank B conference).
13. Ding Wang, **Haibo Cheng**, Debiao He, Ping Wang. “*On the Challenges in Designing Identity-Based Privacy-Preserving Authentication Schemes for Mobile Devices.*” *IEEE Systems Journal*, 2018 (IF: 3.987; **ESI Highly Cited Paper**).
14. Mingli Zheng, **Haibo Cheng (corresponding author)**, Jiahong Yang, Wenbo Zhang, Ping Wang. “*To Learn Better Character Embeddings in Generative Models for Password Attack.*” ICASSP, 2025 (CCF Rank B conference).
15. Wenbo Zhang, **Haibo Cheng (corresponding author)**, Mingli Zheng, Jiahong Yang, Ping Wang. “*Adaptive Password Guessing Framework Using Various Datasets.*” ICASSP, 2025 (CCF Rank B conference).
16. Jiahong Yang, Wenting Li, **Haibo Cheng (corresponding author)**, Ping Wang. “*Username-Password Models Beyond Traditional Password Guessability Assessment.*” ICASSP, 2025 (CCF Rank B conference).
17. Jiahong Yang, Wenting Li, **Haibo Cheng (corresponding author)**, Ping Wang. “*Targeted Password Guessing Using Neural Language Models.*” ICASSP, 2025 (CCF Rank B conference).
18. Wenting Li, Jiahong Yang, **Haibo Cheng (corresponding author)**, Ping Wang, Kaitai Liang. “*Improved WordPCFG for Passwords with Maximum Probability Segmentation.*” ICASSP, 2023 (CCF Rank B conference).
19. Zongjie Zhang, **Haibo Cheng (corresponding author)**, Wenting Li, Ping Wang. “*An Improved GAN-based Depth Estimation Network for Face Anti-Spoofing.*” ICCAI, 2023 (CCF Rank C conference).
20. Jiahong Xie, **Haibo Cheng (corresponding author)**, Rong Zhu, Ping Wang, Kaitai Liang. “*WordMarkov: A New Password Probability Model of Semantics.*” ICASSP, 2022 (CCF Rank B conference).

21. Xiaoxi He, **Haibo Cheng (corresponding author)**, Jiahong Xie, Ping Wang, Kaitai Liang. “*Passtrans: An Improved Password Reuse Model Based on Transformer.*” ICASSP, 2022 (CCF Rank B conference).
22. Wenting Li, **Haibo Cheng**, Ping Wang. “*Secure Chaotic Maps-based Authentication Scheme for Real-Time Data Access In Internet of Things.*” Cyber Security, 2019 (EI indexed).
23. Zhixiong Zheng, **Haibo Cheng**, Zijian Zhang, Yiming Zhao, Ping Wang. “*An Alternative Method for Understanding User-Chosen Passwords.*” *Security and Communication Networks*, 2018 (CCF Rank C journal; IF: 1.288).
24. Ding Wang, Qianchen Gu, **Haibo Cheng**, Ping Wang. “*The Request for Better Measurement: A Comparative Evaluation of Two-Factor Authentication Schemes.*” ASIA CCS, 2016 (CCF Rank C conference).

Patents

1. Wenting Li, **Haibo Cheng**, Peng Cao. *Method and System for Detecting Character Copyright Infringement Based on Visual and Semantic Features.* Chinese Patent Application No. 202510017502.3 (granted).
2. Wenting Li, **Haibo Cheng**. *Video Character Recognition and Copyright Protection Method Based on Contextual and Facial Information.* Chinese Patent Application No. 202511068164.2 (granted).
3. Wenting Li, Ping Wang, **Haibo Cheng**. *A General Three-Party Password-Authenticated Key Exchange Method.* Chinese Patent Application No. 202410875798.8 (under substantive examination).
4. Ping Wang, Zongjie Zhang, Wenting Li, **Haibo Cheng**. *A Generative Face Anti-Spoofing System Based on rPPG Signal Estimation.* Chinese Patent Application No. 202310453716.6 (under substantive examination).
5. Ping Wang, Wenting Li, **Haibo Cheng**. *A General Three-Party Password-Authenticated Key Exchange Method.* Chinese Patent Application No. 202111360908.X (granted).
6. Ping Wang, Wenting Li, **Haibo Cheng**. *A Threshold-Based Dynamic Multi-Factor Authentication Method and Communication Method.* Chinese Patent Application No. 202111158752.7 (granted).
7. Ping Wang, Wenting Li, **Haibo Cheng**. *A Two-Factor Authentication Method for Database User Authentication.* Chinese Patent Application No. 202011560454.6 (granted).
8. Ping Wang, **Haibo Cheng**. *A Method for Evaluating the Resistance of Distribution-Transforming Encoders to Encoding Attacks.* Chinese Patent Application No. 201910361338.2 (granted).
9. Ping Wang, **Haibo Cheng**. *A General Method for Transforming Generative Probability Models into Encoders and an Encryption Method.* Chinese Patent Application No. 201910160645.4 (granted).
10. Ping Wang, **Haibo Cheng**. *A Conditional Distribution-Transforming Encoding Method and Encryption Method.* Chinese Patent Application No. 201910160643.5 (granted).
11. Ping Wang, **Haibo Cheng**, Ding Wang. *A Method for Detecting Password-File Leakage.* Chinese Patent Application No. 201910108998.X (granted).
12. Ping Wang, Zhixiong Zheng, **Haibo Cheng**. *A Word-Based Password Strength Evaluation Method.* Chinese Patent Application No. 201910067574.3 (granted).

Academic Service

- 2025–Present *Electronics* (IF: 2.6), Guest Editor.
- 2021–Present *IEEE Transactions on Dependable and Secure Computing* (CCF Rank A; IF: 7), Reviewer.
- 2024–Present *IEEE Transactions on Information Forensics and Security* (CCF Rank A; IF: 6.3), Reviewer.
- 2025–Present IJCNN 2025, Program Committee Member.
- 2025–Present ICASSP 2025, Program Committee Member.
- 2022–Present EAI SecureComm 2022 (CCF Rank C conference), Program Committee Member.
- 2020–Present TrustCom 2020 (CCF Rank C conference), Program Committee Member.
- 2021–Present *PLOS ONE* (IF: 3.24), Reviewer.
- 2019–Present *IEEE Systems Journal* (IF: 3.931), Reviewer.
- 2018–Present *International Journal of Information Security* (IF: 1.988), Reviewer.