

# Anxiao He

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## EDUCATION

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### Zhejiang University

Hangzhou, China

Ph.D. in Cyberspace Security

Sep. 2020 - Jun. 2025 (Expected)

- Network Security Group, Lab of Cyber Science and Technology, Advisor: Prof. Kai Bu
- Scholarships for new PhD students in 2020

### University of Virginia

Charlottesville, VA, US

Visiting Graduate Researcher in Computer Science

Sep. 2023 – July. 2024

- NetSecurity Group, Advisor: Prof. Yixin Sun

### Zhejiang University

Hangzhou, China

B.Eng. in Computer Science

Sep. 2016 - Jun. 2020

- Chu Kochen Honors College (top 5% of freshmen)
- 2018-2019 First-class scholarship for excellent student in basic discipline (top 25% of class)
- 2018-2019 Third-class scholarship for excellent student (top 20% of college)
- 2020 Excellent thesis design for undergraduates

## RESEARCH EXPERIENCE

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### Zhejiang University (Network Security Group, Lab of Cyber Science and Technology)

Hangzhou, China

Ph.D., Advisor: Prof. Kai Bu

Sep. 2020 - Present

**A. He**, J. Fu, R. Zhou, K. Bu\*, C. Miao, and K. Ren, "Symphony: Path Validation at Scale", NDSS, 2024.

- Focus on the problem that path validation has to trade off security for efficiency.
- Propose an aggregate validation technique to amortize the overhead.
- Propose a packet reaggregation technique to mitigate retransmission due to packet loss.

**A. He**, K. Bu\*, J. Huang, Y. Pang, Q. Qian, and K. Ren, "SwiftParade: Anti-burst Multipath Validation", IEEE Transactions on Dependable and Secure Computing, 2023.

- Focus on the problem of path validation being easy to cause packet loss due to burst arrivals in multipath routing.
- Propose a two-factor encryption scheme to defend against the second residual module attack.
- Present SwiftParade as the first solution toward anti-burst multipath validation.

**A. He**, X. Li, J. Fu, H. Hu, K. Bu\*, C. Miao, and K. Ren, "Hummingbird: Dynamic Path Validation with Hidden Equal-Probability Sampling", IEEE Transactions on Information Forensics and Security, 2023.

- Focus on the problem of path validation being hard to deploy in dynamic path environments.
- Propose a hidden equal-probability sampling technique.
- Present Hummingbird as the first validation solution over fully dynamic paths.

### Zhejiang University (Network Security Group, Lab of Cyber Science and Technology)

Hangzhou, China

Research Assistant, Advisor: Prof. Kai Bu

May. 2018 - Jun. 2020

**A. He**, K. Bu\*, Y. Li, E. Chida, Q. Gu, and K. Ren, "Atomos: Constant-size path validation proof", IEEE Transactions on Information Forensics and Security, 2020.

- Identify linear-scale proofs as the essential barrier to increasing the efficiency of path validation.
- Propose a noncommutative homomorphic asymmetric-key encryption scheme that offers a constant-size proof.
- Explore design strategies to improve efficiency without sacrificing security.

**A. He\***, Y. Xie, W. Mao, and T. Yeh, "Divide and Conquer: Efficient Multi-path Validation with ProMPV", Qshine 2019.

- Focus on the adaptability of path validation in multipath environment.
- Propose a proactive multi-path validation technique in a divide-and-conquer fashion.

## PATENT

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Kai Bu, **Anxiao He**, Jiandong Fu, Ruiqi Zhou, Chenlu Miao, "An efficient network path validation method based on aggregate validation".