

# Anxiao He

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## EDUCATION

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**Zhejiang University** Hangzhou, China

Ph.D. in Computer Science Sep. 2020 - Jun. 2025 (Expected)

- Network Security Group, Lab of Cyber Science and Technology, Advisor: Prof. Kai Bu

**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
- 2019 Gold medal for International Genetically Engineered Machine Competition (iGEM)

## 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

**Hummingbird: Dynamic Path Validation with Hidden Equal-Probability Sampling** (received by *TIFS*)

- 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.

**SwiftParade: Anti-burst Multipath Validation** (under review in *TDSC*)

- 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.

**Symphony: Path Validation at Scale** (under review)

- 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.

**Zhejiang University (Network Security Group, Lab of Cyber Science and Technology)** Hangzhou, China

Research Assistant, Advisor: Prof. Kai Bu May. 2018 - Jun. 2020

**Atomos: Constant-size path validation proof** (received by *TIFS*)

- 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.

**Divide and Conquer: Efficient Multi-path Validation with ProMPV** (received by *Qshine2019*)

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

## PROJECT HIGHLIGHTS

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**Team website of 2019 iGEM**

- Responsible for the website production: <https://2019.igem.org/Team:ZJU-China>

## PERSONAL SKILLS

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- **Programming:** C/C++, Java, Python, JavaScript
- **Toolkits:** OpenSSL, Click, DPDK, Vue
- **Database:** MySQL