Qiyi Yao | Curriculum Vitae

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EDUCATION:

University of Science & Technology of China — **Hefei, Anhui, China**
Ph.D. in Cyber Science & Technology (*Cybersecurity*) — *Sep. 2020 – Present*
Supervisor: Prof. Weiming Zhang

Sun Yat-sen University (SYSU) — **Guangzhou, Guangdong, China**
B.S. in Computer Science & Technology — *Sep. 2016 – Jun. 2020*

RESEARCH INTERESTS:

I am interested in a number of research areas related to the theoretical and practical aspects of computer science, but primarily in information theory and communications.
In particular, I have been working on the following topics in recent years.

Shannon Theory: Extensions of the conventional Shannon Theory to more general scenarios (e.g., the AEP in the non-stationary memoryless regime and its applications)

Source Coding: Extensions of the conventional source coding model and polar codes-based source coding schemes (e.g., lossy source coding with a time-varying distortion measure and lossy polar coding)

Covert Communications: Adaptive steganographic coding and robust adaptive steganographic coding (e.g., LDGM codes-based adaptive steganographic coding schemes and nested polar codes-based robust adaptive steganographic coding schemes)

Watermarking: Vector database watermarking and image watermarking (e.g., watermarking for vector databases based on approximate nearest neighbor searches like HNSW and product quantization)

ARTICLES PUBLISHED, SUBMITTED, OR IN PREPARATION:

Product Quantization Vector Database Watermarking, with Zhiwen Ren, Weiming Zhang, and Nenghai Yu. In Preparation, *IEEE/CVF Conference on Computer Vision and Pattern Recognition* (*CVPR*), 2025.

The Asymptotic Equipartition Property in the Non-Stationary Memoryless Regime and its Applications in Source Coding and Information Embedding, with Weiming Zhang, Kejiang Chen, and Nenghai Yu. Submitted, *IEEE Transactions on Information Theory* (*TIT*).

Vector Database Watermarking, with Zhiwen Ren, Zehua Ma, Kejiang Chen, Wei Fan, Weiming Zhang, and Nenghai Yu. Submitted, *Proceedings of the AAAI Conference on Artificial Intelligence* (*AAAI*), 2025.

Lossy Polar Coding for a Symmetric Discrete Memoryless Source with a Time-Varying Distortion Measure, with Weiming Zhang, Kejiang Chen, and Nenghai Yu. Submitted, *IEEE Transactions on Information Theory* (*TIT*).

Reliable Robust Adaptive Steganographic Coding Based on Nested Polar Codes, with Kai Zeng, Weiming Zhang, and Kejiang Chen. To Appear, *IEEE Transactions on Signal Processing* (*TSP*).

LDGM Codes Based Near-optimal Coding for Adaptive Steganography, with Weiming Zhang, Kejiang Chen, and Nenghai Yu. In *IEEE Transactions on Communications* (*TCOM*), Volume: 72, Issue: 4, April 2024, 2138–2151.

Optimality of Polar Codes in Additive Steganography under Constant Distortion Profile, with Weiming Zhang and Nenghai Yu. In *2022 14th International Conference on Wireless Communications and Signal Processing* (*WCSP*), 2022, 404-408.

AWARDS AND HONORS

First-class Scholarship: University of Science & Technology of China 2024

First-class Scholarship: University of Science & Technology of China 2021

ACADEMIC SERVICES

Reviewer: IEEE Transactions on Communications (TCOM)

TEACHING

Course Assistant (CA) in USTC: CYSC6405P.01: Information Hiding Fall 2024