

Chaoqi Zhang

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RESEARCH INTERESTS

- My research focuses on **time series forecasting** for physiological **vital signals** such as the **electrocardiogram (ECG)**, with the broader goal of building reliable **foundation models** for **healthcare**. Through large-scale empirical studies, I characterize the **generalization** and **long-horizon extrapolation** behavior of modern sequence models on physiological data with broader interests in multimodal representation learning and large language models.

EDUCATION

- **Indiana University Bloomington** Bloomington, IN
Ph.D. in Computer Science *Aug. 2022 – Dec. 2027 (Expected)*
- **The Hong Kong University of Science and Technology** Hong Kong
M.Sc. in Information Technology *Sep. 2019 – Nov. 2020*
- **University of Electronic Science and Technology of China** Chengdu, China
B.Eng. in Communications Engineering *Sep. 2011 – Jul. 2015*

WORK EXPERIENCE

- **Indiana University Bloomington** Bloomington, IN
Research Assistant *Aug. 2022 – Present*
 - Led large-scale empirical studies on the generalization and long-range extrapolation of modern sequence architectures (Transformers, Mamba/SSMs, JEPA-style self-supervised models) for high-dimensional time series; e.g., a 672-run multi-seed sweep on single-lead ECG (VitalDB, ~6,368 cases) found that compressed (CNN-patch) tokenization stays flat at long look-back windows while raw tokenization degrades.
 - Developed ChemBench (ACL 2026), the first lifecycle benchmark for LLMs as analytical-chemistry lab assistants, scoring 9 LLMs on ~350 expert-curated QA pairs across a 6-dimension rubric, with retrieval-augmented generation (RAG) and multimodal evaluation.
 - Built dynamic-analysis and automated program-verification frameworks to audit autonomous systems and mobile data practices at scale, including a dedicated tool that analyzed 107 third-party libraries across 1,605 unique configurations to detect iOS privacy-compliance violations, resulting in multiple publications at ACM CCS 2024 and USENIX Security 2024.
- **The Chinese University of Hong Kong** Hong Kong
Research Assistant *Feb. 2022 – Aug. 2022*
 - Built an automated bug-detection tool on top of the KLEE symbolic-execution engine to uncover deep vulnerabilities in network protocol software.
- **The Hong Kong University of Science and Technology** Hong Kong
Research Assistant *Jul. 2020 – Jan. 2022*
 - Engineered a high-throughput, real-time data-streaming pipeline and demonstration system using Apache Flink and Apache Kafka to process continuous query updates over complex database schemas, leading to a core system publication at VLDB 2021. Implemented backend coordination via Flask and interactive data visualizations via React and Apache ECharts.
- **TP-Link Technologies Co., Ltd** Shenzhen, China
Software Engineer, SMB Department *Aug. 2015 – May 2017*
 - Led full-stack development of an enterprise Radio Calibration & Test System, tripling production throughput and deploying it across 13 wireless hardware products while coordinating a team of 4 engineers.

PUBLICATIONS

- [1] **LLMs as Lab Engineers: A Benchmark for Analytical Method Lifecycle Management**
Xiaoyi Chen, Mahsa Monshizadeh, **Chaoqi Zhang**, Jianjun Lang, Yang Wu, Genevieve Mortensen, Xiaozhong Liu, Haixu Tang
In the Proceedings of the 64th Annual Meeting of the Association for Computational Linguistics (**ACL 2026**).
- [2] **RVSPEC: Cyber-Physical Interplay Graphs for Formal Specification of Robotic Vehicle Control Software**
Chaoqi Zhang, Minhyun Cho, Inseok Hwang, Hyungsub Kim.
In the Proceedings of the 2026 IEEE International Conference on Robotics and Automation (**ICRA 2026**).
- [3] **Avara: A Uniform Evaluation System for Perceptibility Analysis Against Adversarial Object Evasion Attacks** [PDF]
Xinyao Ma, **Chaoqi Zhang (Co-first author)**, Huadi Zhu, Jean Camp, Ming Li, Xiaojing Liao.
In the Proceedings of the 2024 on ACM SIGSAC Conference on Computer and Communications Security (**ACM CCS 2024**).
- [4] **Measuring Compliance Implications of Third-party Libraries' Privacy Label Disclosure Guidelines** [PDF]
Yue Xiao, **Chaoqi Zhang**, Qin Yue, Fares Fahad S Alharbi, Luyi Xing, Xiaojing Liao.
In the Proceedings of the 2024 on ACM SIGSAC Conference on Computer and Communications Security (**ACM CCS 2024**).
- [5] **iHunter: Hunting Privacy Violations at Scale in the Software Supply Chain on iOS** [PDF]
Dexin Liu, Yue Xiao, **Chaoqi Zhang**, Kaitao Xie, Xiaolong Bai, Shikun Zhang, Luyi Xing.
In the 33rd USENIX Security Symposium (**USENIX Security 2024**).
- [6] **Cquirrel: Continuous Query Processing over Acyclic Relational Schemas** [PDF]
Qichen Wang, **Chaoqi Zhang**, Danish Alsayed, Ke Yi, Bin Wu, Feifei Li, Chaoqun Zhan.
In the Proceedings of the VLDB Endowment 14(12): 2667-2670 (2021) (**VLDB 2021**).

TECHNICAL SKILLS

- **ML & AI:** PyTorch, JAX, HuggingFace Transformers, Mamba/SSM, LLMs, Scikit-Learn, NumPy, Pandas
- **Data & Systems:** Apache Flink, Apache Kafka, PostgreSQL, Linux, Git, Docker
- **Languages:** Python, C/C++, Java, SQL, Shell

SERVICES

- Artifact Evaluation Committee: *NDSS* (2026), *ACM CCS* (2025), *ACSAC* (2022, 2023)
- Reviewer: *IEEE S&P* (2023–2025), *RAID* (2025), *ACM CCS* (2023), *ACSAC* (2023)

TEACHING

- Assistant Instructor, Indiana University Bloomington — Advanced Operating Systems, Computer Networks, Systems & Network Security, Data Analysis & Mining 2022–2026

AWARDS AND HONORS

- Best Poster Award, *Midwest Security Workshop* 2025
- National Encouragement Scholarship, *UESTC* 2012, 2013