Tingwei Zhang

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Research Interests

Tingwei focuses on exploring security and privacy challenges in machine learning technologies, particularly in real-world scenarios and under adversarial conditions, to develop secure, ethical, and privacy-preserving AI systems.

Education

Cornell University Since 2023

Ph.D. in Computer Science

– Advised by Vitaly Shmatikov

University of Virginia (UVA) 2020 – 2023

B.A. in Computer Science with Minor in Statistics

– Graduated with *Highest Distinction* in Distinguished Majors Program in computer science.

– Worked with Prof. David Evans and Prof. Yuan Tian on security of machine learning projects at SRG at UVA.

Publications

Conference Papers

Tingwei Zhang*, R. Jha*, E. Bagdasarya, V. Shmatikov, "Adversarial illusions in multi-modal embeddings," in *Proceedings of the 33rd USENIX Security Symposium (USENIX Security),* Philadelphia, PA, USA, 2024. arxiv.org/abs/2308.11804 (Distinguished Paper Award, Artifacts available, Artifacts functional, Results reproduced)

Tingwei Zhang, C. Zhang, J. X. Morris, E. Bagdasarya, V. Shmatikov, "Self-interpreting Adversarial Images," in *Proceedings of the 34th USENIX Security Symposium (USENIX Security),* Seattle, WA, USA. 2025. arxiv.org/abs/2407.08970

S. Fnu, A. Suri, Tingwei Zhang, J. Hong, Y. Tian, and D. Evan, "SoK: Pitfalls in evaluating black-box attacks," in *Proceedings of the 2nd IEEE Conference on Secure and Trustworthy Machine Learning (SaTML),* Toronto, Canada, 2024. arxiv.org/abs/2310.17534

Preprints

Tingwei Zhang, S. Fnu, R. Jha, C. Zhang, V. Shmatikov, "Adversarial hubness in multi-modal retrieval," in *Preprint,* 2024. arxiv.org/pdf/2412.14113

C. Zhang, Tingwei Zhang, V. Shmatikov, "Controlled generation of natural adversarial documents for stealthy retrieval poisoning," in *Preprint,* 2024. arxiv.org/pdf/2410.02163

See Google Scholar profile for a full list.

Teaching

Cornell Tech CS5450: Networked and Distributed Systems, Head TA — Spring 2024

Cornell University CS2110: Object-Oriented Programming and Data Structures, TA — Fall 2023

UVA CS4774: Machine Learning, TA — Fall 2022

UVA CS4102: Algorithms, TA — Spring 2022

Honors & Awards

Distinguished Paper Award at USENIX Security — Aug. 2024

USENIX Security Student Grant'2024 — Aug. 2024

Dean's List of Distinguished Students, College of Arts & Sciences, UVA — 2021 & 2022

Talk & Presentations

Adversarial Illusions in Multi-modal Embeddings Aug. 2024
Conference Talk, USENIX Security Symposium

Attacking and Defending Multi-Modal Representations Dec. 2024
Invited Talk, University of Virginia CS, Research Seminar

Adversarial Illusions in Multi-Modal Embeddings Apr. 2025
Invited Talk, RSAC'2025

Internship

Amazon AGI Security, Seattle 2025
Security Engineer
– Evaluated Nova Sonic speech-to-speech model