Xuanhao Luo

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EMPLOYMENT

- **Lenovo**, Morrisville, NC *Jun. 2025 - Present*
  Research Intern — LLM Security, Safety Evaluation and Alignment.

- **North Carolina State University**, Raleigh, NC *Aug. 2023 - Present*
  Research/Teaching Assistant — Generative AI, Intelligent Networks

- **Syracuse University**, Syracuse, NY *May. 2022 - Aug. 2022*
  Research Intern (remote) — Data Mining, Natural Language Processing (NLP)

EDUCATION

- **Ph.D. candidate in Computer Science** *Aug. 2023 - Present*
  North Carolina State University — Raleigh, NC

- **M.S. in Computer Science** *Aug. 2023 - May. 2025*
  NCSU ("en route" to the PhD) — Raleigh, NC

- **B.E. in Computer Science & Technology** *Sept. 2019 - July 2023*
  Kunming University of Science and Technology — Kunming, China

PROJECTS

LLMs and NLP *2022 - Now*

- Tool-augmented LLMs: LLM-Enabled active learning for log data analysis | Evaluated LLMs for advanced computer networks learning support
- LLM safety alignment: Evaluated LLM safety with existing benchmarks | Built task-specific safety datasets | Explored defense and alignment methods.
- Hate speech detection: Provided benchmarks results on public datasets using TextCNN, RNN, and GNN. | Multi-modal detection using knowledge graph, NLP and image processing.

Intelligent Networks *2020 - Now*

- Generative AI: Radio map generation in mmWave and 5G networks via DDPM, cGAN, pix2pix, and cVAE | Spatial temporal data imputation for wireless sensor networks.
- Deep Learning: Rank-based packet compression with Byte Transformer | Efficient communication for ISAC system with model adaptation | BFM-based positioning with vision Transformer.
- Reinforcement Learning: TD3-based active queue management for the vSwitch in multi-tenant data center | Double DQN-based UAV schedule for sensor networks | Multi-Armed Bandits for context-aware beam management.

Embedded System and IoT (*During Bachelor*) *2019 - 2021*

- STM32: Embedded image recognition system based on CNN | Quadcopter flight control system.
- Raspberry Pi: Machine Vision for Object Detection | Mechanical Arm Control | Path Planning.

SKILLS

Tools: LangChain/OpenAI | Huggingface | **Pytorch/TensorFlow(5 years)**/Keras | Git | ns-3 | Wireshark.

Programming: **Python(5 years)** | Java | C/C++ | MATLAB | SQL | Bash | Assembly | HTML.

Others: STM32 & c51 | Raspberry Pi | Jetson Nano | Embedded System Development | AutoCAD.

PUBLICATIONS

[15] *X. Luo*, Z. Li, M. Chen, R. Yu, S. Mao, Y. Liu. "**Unified Packet Compression and Model Adaptation for Integrated Sensing and Multi-Modal Communications**", *IEEE Journal on Selected Areas in Communications (JSAC)*, IF: 13.8. Under major revision. 2025.

[14] *X. Luo*, D. Wu, Z. Li, X, Lin, Y. Liu. "**Reshaping Network Data with Generative AI: From Augmentation, Processing to Autonomous Analysis**", *IEEE Communication Magazine (ComMag)*, IF: 8.3. Under review, 2025.

[13] *X. Luo*, S. Jha, A. Sinha, Z. Li, Y. Liu. "**ALPHA: LLM-Enabled Active Learning for Human-Free Network Anomaly Detection**", *IEEE Internatonal Conference on Mobile Ad-hoc and Sensor Systems (MASS)*. Under review, 2025. *code*

[12] J. Xing, G. Sun, H. Sun, L. Pan, S. Mahmood, *X. Luo*, M. Shahzad. "**NetSight: Graph Attention Based Network Traffic Forecasting in Computer Networks**", *IEEE International Conference on Network Protocols (ICNP) 2025*. Under review (preprint). 2025.

[11] Z. Li, *X. Luo*, M. Chen, C. Xu, Y. Liu. "**BFMLoc: Transformer-Based Indoor Positioning Leveraging Beamforming Feedback Matrices**", *IEEE International Conference on Communications (ICC)*. Accepted (to appear), 2025.

[10] *X. Luo*, Z. Peng, Z. Li, R. Yu, Y. Liu. "**Rank-Based Modeling for Universal Packets Compression in Multi-Modal Communications**", *IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, AR: 20.8%. Published. 2025. *code*

[9] Z. Li, P. Wang, X. Liang, *X. Luo*, Y. Liu, X. Wang, H. Gu, R. Yu. "**AdaOrb: Adapting In-Orbit Analytics Models for Location-aware Earth Observation Tasks**", *IEEE International Conference on Pervasive Computing and Communications (PerCom)*. AR: 15.7%. Published. 2025.

[8] *X. Luo*, Z. Li, Z. Peng, M. Chen, Y. Liu. "**Denoising Diffusion Probabilistic Model for Radio Map Estimation in Generative Wireless Networks**", *IEEE Transactions on Cognitive Communications and Networking (TCCN)*. IF: 7.4, Published, 2025.

[7] Z. Li, *X. Luo*, M. Chen, C. Xu, S. Mao, Y. Liu. "**Contextual Combinatorial Beam Management via Online Probing for Multiple Access mmWave Wireless Networks**", *IEEE Journal on Selected Areas in Communications (JSAC)*, IF: 13.8, CCF: A. Published, 2025.

[6] *X. Luo*, Z. Li, Z. Peng, D. Xu, Y. Liu. "**RM-Gen: Conditional Diffusion Model-Based Radio Map Generation for Wireless Networks**", *IFIP/IEEE Networking*, 2024.

[5] Z. Li, *X. Luo*, M. Chen, C. Xu, Y. Liu. "**Context-Aware Beam Management via Online Probing in Combinatorial Multi-Armed Bandits**", *IEEE International Conference on Communications (ICC)*. 2024.

[4] H. Ma, *X. Luo*, D. Xu. "**Intelligent Queue Management of Open vSwitch in Multi-tenant Data Center**", *Future Generation Computer Systems*, IF: 7.3. 2023.

[3] *X. Luo*, Y. Feng, C. Wang. "**A Clothoid Curve based Intersection Collision Warning Scheme in Internet of Vehicles**", *The Computer Journal*, CCF: B. 2022.

[2] H. Li, R. Zhou, D. Shi, *X. Luo*, X. Chen, D. Liao. "**A Lightweight Block Storage Security Scheme based on LT Coding for 6G Network**", *12th International Symposium on Parallel Architectures, Algorithms and Programming (PAAP)*. 2021.

[1] C. Li, J. Mao, D. Li, Z. Ma, *X. Luo*. "**Design of embedded image recognition system for lightweight convolutional neural network**", *Journal of Automation and Instrumentation (in Chinese)*. 2021.

COURSEWORK

- **PhD:** Advanced Topics in Machine Learning (ML) | ML with Graphs | Computer Networks | Graph Theory | Advanced NextG Network Design | Computer & Network Security | Advanced Network Security | Cryptography | Advanced Learning Technologies for CS Education.

- **Bachelor:** C/C++, JAVA & Python | Data Mining | OS | Computer Architecture | Circuit | Compiler.

TEACHING

Mentoring

- Mentor, NCSU Gears Program. **(LLM for network defense)** — Winter 2025.
- Mentor, Summer Residential Camps: "Seeing through a Digital World". **(Lectures on ns-3)** — Aug. 2024.
- Haotian Zhu (undergrad intern @ NC State) — Winter 2025

Teaching Experience (NC State University)

- Teaching Assistant, CSC 316 - Data Structures and Algorithms. — 2025 Spring.
- Teaching Assistant, CSC 226 - Discrete Mathematics for Computer Scientists. — 2024 Spring.
- Teaching Assistant, CSC 246 - Concepts and Facilities of Operating Systems. — 2024 Spring.
- Teaching Assistant, CSC 226 - Discrete Mathematics for Computer Scientists. — 2023 Fall.

SERVICE

Journal Reviewer

- IEEE Journal on Selected Areas in Communications (**JSAC**) — 2025.
- Journal of Network and Computer Applications (**JNCA**) — 2025.
- Elsevier Computer Communications (**ComCom**) — 2025.

Conference Reviewer

- IEEE Conference on Local Computer Networks (**LCN**) — 2025.
- ACM Web Conference (**WWW '25**) — 2025.
- IEEE International Conference on High Performance Switching and Routing (**HPSR**) — 2025.
- IEEE International Conference on Communications (**ICC**) — 2025.
- International Joint Conference on Neural Networks (**IJCNN**) — 2025.
- IEEE International Conference on Computer Communications (**INFOCOM**) Workshop — 2025.
- IEEE Global Communications Conference (**Globecom**) Workshop. — 2024.
- IEEE International Conference on Communications (**ICC**) Workshop. — 2024.

AWARDS

NC State Travel Award for *IEEE WoWMoM*	Mar. 2025
NSF Travel Award	May. 2024
NC State graduate student Travel Award for *IEEE ICC*	Feb. 2024
Excellent Graduation Thesis	June. 2023
National Computer Design Competition (***National Second-Class Award***)	Aug. 2021
National Engineering Training Competition for College Students (***Provincial Gold Award***)	Apr. 2021
"Internet plus" Competition (***Provincial Silver Award***)	July. 2021
Service Outsourcing Innovation Competition (***Regional Third-Class Award***)	June. 2021
National College Students Electronic Design Competition (***Provincial Third-Class Award***)	Nov. 2021
Innovation and Entrepreneurship scholarship of the university	Sept. 2021
Second-class scholarship of the university	Sept. 2020

PATENTS

[2] "**A mobile wireless charging device.**", No.: CN202121232922.7.

[1] "**Handheld lighting terminal based on three axis acceleration sensors.**", No.: CN201820762072.3.