NENGBO WANG

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Summary

PhD student in Computer Science (dual track with Marketing), focusing on LLMs, RAG, and causal inference. Experienced AI-specialized researcher (2 years in academia) and applied scientist (2 years in industry), with ML algorithms deployed at market-leading companies impacting 10M+ users. Top-tier AI conference publication, multiple ongoing projects targeting top AI venues/under review, and 7 patents.

Education

Case Western Reserve University Cleveland, OH

Ph.D., Computer Science (Dual Track with Marketing) *Aug 2023 – June 2027 (expected)*

- Research Focus: CS - LLMs, RAG, and Causal Inference; Marketing - AI Conceptualization and Deployment
- Excellent Researcher Student Award (Top-20 students university-wide), Oct 2024
- Advisors: Dr. Vipin Chaudhary (CS) and Dr. Jagdip Singh (Marketing)

Case Western Reserve University Cleveland, OH

M.S., Business Analytics *Aug 2018 – Jan 2020*

- GPA 3.86/4.0. Coursework: Machine Learning (A), Statistics (A), Predictive Modeling (A)

Jiangsu University Jiangsu, China

B.S., Industrial Engineering *Sep 2014 – Jun 2018*

- GPA 3.5/5.0. Coursework: C Programming (A), Probability Statistics (A), Database Management (A)

Projects

CausalRAG: Integrating Causal Graphs into RAG Cleveland, OH

Researcher, First Author *Jan 2024 – Aug 2025*

- Introduced causality into large language model frameworks by incorporating causal graphs into the RAG pipeline, significantly improving answer faithfulness (+10.64%) and context precision (+19.16%) over state-of-the-art (SOTA) methods [1].
- Spearheaded the project and independently executed ~95% of the coding workload, including LLM evaluation, reproduction and implementation of various base LLMs, and re-implementation of SOTA frameworks as baselines.
- Published at a top AI conference, the Association for Computational Linguistics (ACL) 2025 [Paper].

Rethinking What Should Be Retrieved for LLMs Cleveland, OH

Researcher, First Author *Mar 2025 – Present*

- Rethought the dominant "searching game" paradigm in retrieval for large language models by introducing a novel reasoning-oriented perspective, enabling evaluation of full-document and cross-document comprehension as well as deeper reasoning capabilities.
- Led the project and coordinated a diverse team of co-authors on knowledge graph construction, framework development, dataset curation (114,000 internal documents), and comprehensive design, implementation, and analysis of LLM evaluation experiments at scale.
- Ongoing project targeting AI conferences 2026 (NeurIPS/ICML/ACL); preliminary findings presented in internal research workshops.

AI for Sales Cleveland, OH

Researcher, First Author *Sep 2024 – Present*

- Developed a strongly theory-driven framework (AGA typology) to bridge the gap between AI conceptualizations and real-world deployment, systematically coding 45 state-of-the-art applications based on diverse developer guides across technical features.
- Collaborated with five team members on interdisciplinary literature collection, extensive coding, detailed cross-checking and review, and iterative synthesis into one comprehensive 50-page manuscript [2] and one handbook [3].
- Paper under review at a top-tier journal (14% acceptance rate), passed initial submission and the first-round revision.

Experience

Yum R&D Center Shanghai, China

Applied Scientist, AI & Data Team *Apr 2021 – Aug 2023*

- Contributed to the development and deployment of AI/ML systems for Yum brands (*KFC, Pizza Hut, Taco Bell*), independently responsible for algorithm design and modeling; supported 10+ brand-level projects across 10k+ stores, impacting 10M+ users.
- Led algorithm development for three projects (end-to-end), including KFC Pocket Manager (+15.5% ROI) [4], KFC App Feeds (+11.5%) [5], and Pizza Hut AI Community (+12.4%) [6], collaborating closely with business teams (ops/marketing) to translate complex requirements into deployable AI solutions concerning language models, forecasting, computer vision, and recommender systems.

- Transferred as Senior Engineer to R&D Center in Oct 2022; authored multiple patents and co-developed 2 trade secrets; received an Innovation Award and Scholarship.

MetersBonwe Group Shanghai, China

Data Scientist, Data Science Research Team *Oct 2020 – Mar 2021*

- Built and deployed AI/ML algorithms for 1,000+ retailers; collaborated with supply chain, retail, and marketing teams to deliver AI solutions addressing complex business needs, including forecasting models (user volume) and computer vision (overstock detection).
- Led the design and development of ML systems for store-entry prediction and climate/temperature-driven demand forecasting; integrated into the inventory platform, reducing overstock waste by 29% and increasing sales by 11% in Q4.
- Selected to join the CEO's 8-person core team for strategic data initiatives; contributed to the analytics roadmap and cross-functional execution, building internal semantic analysis and predictive tools.

Awards

- Excellent Researcher Student Award (Top-20 university-wide), CWRU, Oct 2024.
- Innovation Award and Scholarship, Yum R&D Center, 2021-2022.
- Excellent Graduate Award, Jiangsu University, Jun 2018.

Activities & Expertise

- Presented *"Artificial Intelligence Definition and Typology"* at the CWRU Board of Trustees (Top-3 student presenters school-wide), Oct 2024.
- Taught course **Machine Learning and Artificial Intelligence** (section on Transformers and Attention Mechanisms), Fall 2025.
- Programming & Tools: Python, PyTorch, TensorFlow, Transformers (Hugging Face), scikit-learn, Git, Linux, R, SQL (Hive/Oracle/Spark SQL), C, C# (Unity), SAS, SPSS, Spark, Databricks, AWS, Hive, Arena Simulation.
- ML/AI Expertise: LLMs, RAG, causal inference, NLP (classification, NER, sentiment, topic modeling), recommender systems, time-series forecasting.
- Certifications & Editorial Service: AI & Data Engineering; Advanced Google Analytics; International Logistician; Reviewer of *Journal of Service Research*.

Publications & Patents

1. Wang, N., Han, X., Singh, J., Ma, J., & Chaudhary, V. *CausalRAG: Integrating Causal Graphs into Retrieval-Augmented Generation*. Proceedings of the 63rd Annual Meeting of the Association for Computational Linguistics (ACL 2025), July 2025.
2. Wang, N., Nahm, I., Pu, Q., Mojir, N., & Singh, J. *Generative AI Technologies and B2B Sales: Framework, Roles, and Future Directions*. Journal of Personal Selling and Sales Management, Special issue on "Advancing the Field of Selling and Sales Management - Twenty-Year Update", Manuscript under review.
3. Wang, N., Pu, Q., Nahm, I., Mojir, N., & Singh, J. *Technological and Digitalization Forces Shaping B2B Sales: Confluence, Challenges, Promises, and Pitfalls*. *Handbook of Interorganizational Relationships*, Handbook under review.
4. Wang, N., Bi, C., & Fu, Y. *Recommendation Method, Device, and Electronic Apparatus Based on Multimodal Features*. Chinese Patent, CN118093984A, May 2024.
5. Wang, N. *Image Processing Method and Apparatus*. Chinese Patent, CN118053002A, May 2024.
6. Wang, N. *Image Color Recognition and Recommendation Method and Device*. Chinese Patent, CN118053001A, May 2024.
7. Bi, C., Wang, N., & Wang, Z. *Image Generation Method and Apparatus Based on Artificial Intelligence*. Chinese Patent, CN114723855A, Jul 2022.
8. Wang, N., Ling, Y., & Fu, Y. *Method and Device for Determining and Evaluating Business Data Categories*. Chinese Patent, CN114219037A, Mar 2022.
9. Wang, N. *Business Classification Method and Device Based on Machine Learning*. Chinese Patent, CN115018405A, Sep 2022.
10. Li, L., & Wang, N. *Method for Processing Financial Data Using Deep Learning*. Chinese Patent, CN114049189B (Granted), Apr 2025.