Ningning Xu

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Profile

Engineering PhD candidate expecting to graduate in May 2027, with graduate and undergraduate training in statistics. Research and industry experience in transportation perception, synthetic and real-world data evaluation, and automated testing. Develops and evaluates vision models for adverse weather, nighttime wildlife detection, and road hazard assessment.

Education

University of Georgia August 2023 - May 2027 expected

PhD in Engineering | College of Engineering | Advisor Jidong Yang

Beijing Normal University September 2015 - June 2021

Master of Applied Statistics, June 2021 | BS in Statistics, June 2019

Technical Skills

Programming and analysis: Python, NumPy, pandas, SQL, R
Machine learning: PyTorch, deep learning, object detection, segmentation, image restoration
Model evaluation: Scene-level cross-validation, error analysis, ablation studies, and evaluation on synthetic and real-world data

Research and Engineering Experience

University of Georgia August 2023 - present

Doctoral Researcher

- Developed an efficient deer-detection model and contributed to data collection, curation, experimental analysis, and range-estimation research for rural-road hazard assessment.
- Contributed to evaluation across held-out scenes, distance bands, and road environments to identify generalization failures and the limits of detection and ranging performance.
- Led method design, implementation, training, experiments, analysis, and writing for collaborative image-restoration and model-efficiency studies.
- Debugged V2X communications during May 2026 North Carolina field tests and subsequent UGA prototype tests. Participated in a separate faculty-led UGA-Astec inspection research collaboration in August-December 2024.

Astec Digital ATG May - August 2026

Computer Vision Engineer Intern

- Developed truck and truck-bed detection and segmentation components for loading-area monitoring; used simulated and enhanced imagery in model development.
- Built two SiloBot web applications for inspection-image and video processing, question answering, and report preparation; completed development through the internal-testing stage.

Huawei August 2021 - July 2023

Test Engineer

- Developed a Python framework to automate AR-HUD image-quality testing and collaborated with hardware engineers on vehicle integration and validation.
- Created internal technical articles and training videos to share testing procedures and engineering findings.

Selected Publications

J. Zhang, N. Xu, H. Zhang, and G. Lu. Depth Estimation Based on 3D Gaussian Splatting Siamese Defocus. IEEE ICRA, 2025, pp. 15052-15058. Zhang and Xu contributed equally. DOI 10.1109/ICRA55743.2025.11127429

N. Xu and J. J. Yang. Leveraging Scene Geometry and Depth Information for Robust Image Deraining. Computers, 14(1), 11, 2025. DOI 10.3390/computers14010011

Y. Yang, N. Xu, and J. J. Yang. Structured Prompting and Collaborative Multi-Agent Knowledge Distillation for Traffic Video Interpretation and Risk Inference. Computers, 14(11), 490, 2025. DOI 10.3390/computers14110490

Y. Yang, N. Xu, and J. J. Yang. Multi-agent visual-language reasoning for comprehensive highway scene understanding. Applied Computing and Intelligence, 5(2), 315-336, 2025. DOI 10.3934/aci.2025018

H. Ren, N. Xu, Y. Lin, S. Zhang, and T. Yang. Remedial Teaching and Learning From a Cognitive Diagnostic Model Perspective: Taking the Data Distribution Characteristics as an Example. Frontiers in Psychology, 12, 628607, 2021. DOI 10.3389/fpsyg.2021.628607

N. Xu, Y. Jiang, and S. R. Dipta. Learning How to Use Tools, Not Just When: Pattern-Aware Tool-Integrated Reasoning. NeurIPS 2025 Workshop MATH-AI, 2025. https://openreview.net/forum?id=R3rTyISf0v

Research Focus

- Image restoration under adverse weather and low illumination, including geometry and depth cues for robust deraining.
- Compact models and structural compression, with evaluation of restoration quality, compute, and measured inference latency.
- Nighttime deer detection and range estimation, and cooperative vehicle-roadside hazard assessment with V2X communications.
- Vision-language models for traffic video interpretation, road conditions, and risk inference.

Selected Honors

Master's Entrance Scholarship for Outstanding Students, 2019; MCM Honorable Mention, 2018; Beijing Normal University first-class scholarship, 2016.