

Yuan Ning

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EDUCATION

Henan University of Technology

B.S. in Computer Science and Technology

GPA: 82/100; Class Rank: 3/36

Zhengzhou, Henan, China

Sep 2022–Jun 2026 (Expected)

Kenilworth Science & Technology Charter School

International Experience

Baton Rouge, LA, US

Feb 2016–Feb 2017

RESEARCH INTERESTS

- Multimodal Learning (Intersection of Vision and Language)
- Computer Vision
- Natural Language Processing

PUBLICATIONS

- [1] **Ning Y**, Lv P, Zhang Q, Xiao L, Wang C. From Vision-Only to Vision + Language: A Multimodal Framework for Few-Shot Unsound Wheat Grain Classification. *AI*. 2025; 6(9):207. <https://doi.org/10.3390/ai6090207> (**JCR Q1, IF=5.0**)
- [2] Lv P, **Ning Y**, Zhang Q, Xiao L, Wang C, Wang J, Fan, Y. ECA-ModNet: A Lightweight Unsound Grain Classification Network for Wheat Storage (Submitted)

RESEARCH EXPERIENCE

From Vision-Only to Vision + Language: A Multimodal Framework for Few-Shot Unsound Wheat Grain Classification

Mar 2025–Sep 2025

Project Leader | *Advisor: Pengtao Lv* | *Henan University of Technology*

- Proposed two vision-language frameworks for unsound wheat grain classification, namely UWGC-F (Training-free) and UWGC-T (Training-required), addressing the lack of few-shot methods in this domain
- Integrated APE and ATPrompt, and further employed the multimodal model Qwen2.5-VL for attribute extraction and prompt generation to remove the modality blind spots (text or image). This dual-perspective design principle significantly improved the framework's capability in few-shot scenarios
- Published a research article as the first author in the *AI* (**JCR Q1, IF=5.0**)

RAG-based Code Search Assistant (Summer Research Intern)

Jul 2024–Aug 2025

Project Leader | *Advisor: Xihao Xie* | *Southern Methodist University*

- Built a RAG pipeline for semantic code search (Chroma + Top-K → Qwen3-14B) that returns the best snippet with generated usage guide
- Delivered a modular, swappable stack with two embedding back-ends—Gemini Embeddings (cloud, powerful) and GraphCodeBERT (local, privacy)—and the deployment options selectable at run time
- Presented a live demo and technical talk to the Associate Dean, Department Chair, and advisor, showing our RAG-based approach solves cases where traditional search methods fail

A Modulation Neural Network for Unsound Grain Detection

Dec 2024–Mar 2025

Project Leader | *Advisor: Pengtao Lv* | *Henan University of Technology*

- Employed a dual-branch design to integrate local structure awareness and long-range dependency modeling.

This enhances feature extraction under lightweight constraints

- Improved MBConv block by introducing the ECA attention mechanism, which avoids channel dimensionality reduction and enables more lightweight cross-channel interaction modeling
- Developed **ECA-ModNet**, a lightweight model that **improves accuracy by 3.17%** while using **3.7M fewer parameters** than the baseline. Second author on a research article submitted to the *Journal of Stored Products Research*

An Improved Lightweight ConvNeXt for Rice Classification

Aug 2024–Dec 2024

Research Assistant | Advisor: Pengtao Lv | Henan University of Technology

- Conducted comprehensive experiments on CBAM-ParNeXt V1 and V2, evaluating their overall and subclass-level performance using a confusion matrix
- Cleaned and organized the dataset, then applied data augmentation (rotation, flipping, cropping, etc.) to enhance diversity and improve model generalization
- Trained and tested other vision models to validate the effectiveness of our proposed model through comparison

Identification and Optimization of Ecological Security Patterns Using a Bayesian Network Model: Based on Trade-offs in Ecosystem Services

May 2024–Aug 2024

Research Assistant | Advisor: Xuning Qiao | Henan Polytechnic University

- Constructed a Bayesian network to probabilistically model the relationships between variables (e.g., rainfall, evapotranspiration, population density) and their states affecting ecosystem services
- Conducted sensitivity analysis on nodal factors using the Bayesian network to identify key variables impacting ecosystem service trade-offs and proposed the optimal subset of states for these variables
- Leveraged mathematical packages (e.g., NumPy) in Python to improve calculation efficiency during experiments and used visualization tools (e.g., Matplotlib, Seaborn) to present results effectively

How Well Does Street View Measure Actual Vision Experimental Comparison of Visual Measurements in Street View Imagery and Visual Perception

Dec 2023–Apr 2024

Research Assistant | Advisor: Yi Zhang | Zhengzhou University

- Utilized the U-Net semantic segmentation model to evaluate performance under different projection methods (e.g., equirectangular, cubic, fisheye) and investigate how projection distortions from 3D environments to 2D street view images impact segmentation accuracy, comparing classification biases across projection approaches
- Calculated key experimental parameters (e.g., angle, ratio relative error) using Python, and employed visualization tools like Matplotlib and Seaborn to present results intuitively and analyze error trends between measurement methods (pixel proportion vs. solid angle)
- Completed the relative proportion comparison experiment by adjusting the distance and elevation angle between the sphere and the observer, measuring the sphere's size variations under different Street View Imagery (SVI) projections and solid angles

SKILLS & INTERESTS

Skills: Programming Languages: *Python (Expert); Java (Familiar); C++* | Frameworks: *PyTorch; TensorFlow; Hugging Face; Ollama; Timm* | Database: *Chroma; FAISS*

Language: Mandarin Chinese; English (TOEFL: 97)

Interests: Basketball; Swimming; Movies