Yuxin JIANG

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Education

Huazhong University of Science and Technology, PhD *Wuhan, China*
School of Mechanical Science and Engineering (Supervisor: Prof. Weiming Shen) Sep. 2024 - Present
Huazhong University of Science and Technology, Master *Wuhan, China*
School of Mechanical Science and Engineering (Supervisor: Prof. Weiming Shen) Sep. 2022 - Jun. 2024
Huazhong Agricultural University, Bachelor *Wuhan, China*
School of Agricultural Mechanization and Automation Engineering, Top 3% Sep. 2018 - Jun. 2022

Core Competencies

Research Interests: Anomaly Detection, Vision-Language Models, Image Generation, Computer Vision

Academic Impact: First-author publications in premier venues (e.g., AAAI, IEEE TNNLS) and resultant patents.

Technical Expertise: Adaptation of foundation models (CLIP, LLMs, Stable Diffusion); multimodal anomaly detection; intelligent optimization algorithms.

Applied Contributions: Industrial deployment of anomaly detection frameworks for quality assurance via university-industry collaborations (e.g., Tesla suppliers); synthetic anomaly generation for industrial parts to reduce reliance on scarce real defect samples.

Publications (Accepted)

1. Anomagic: Crossmodal Prompt-driven Zero-shot Anomaly Generation [Paper] [Code] [Project]
   • *Journal:* AAAI Conference on Artificial Intelligence (CCF-A, 2026)
   • *Authors:* Y. Jiang, W. Luo, H. Zhang, Q. Chen, H. Yao, W. Shen, Y. Cao
   • *Summary:* Introduces Anomagic for zero-shot anomaly generation using crossmodal prompt encoding to guide inpainting and contrastive refinement for mask alignment, trained on AnomVerse to produce realistic anomalies enhancing downstream detection.

2. Prototypical Learning Guided Context-Aware Segmentation Network for Few-Shot Anomaly Detection [Paper] [Code]
   • *Journal:* IEEE Transactions on Neural Networks and Learning Systems (SCI Q1, 2024)
   • *Authors:* Y. Jiang, Y. Cao, W. Shen
   • *Summary:* Proposes PCSNet with prototypical feature adaptation via contrastive learning and context-aware segmentation for precise localization, addressing domain gaps in few-shot anomaly detection on industrial datasets.

3. A Masked Reverse Knowledge Distillation Method Incorporating Global and Local Information for Image Anomaly Detection [Paper] [Code]
   • *Journal:* Knowledge-Based Systems (SCI Q1, 2023)
   • *Authors:* Y. Jiang, Y. Cao, W. Shen
   • *Summary:* Proposes Masked Reverse Knowledge Distillation with image- and feature-level masking to combat overgeneralization in anomaly detection by capturing global context and local details.

4. A Novel Bio-inspired Algorithm for Global Optimization Problems [Paper]
   • *Journal:* Expert Systems with Applications (SCI Q1, 2022)
   • *Authors:* Y. Jiang, Q. Wu, S. Zhu, L. Zhang
   • *Summary:* Introduces Orca Predation Algorithm, simulating orca hunting to balance exploration and exploitation for global optimization on benchmarks and engineering problems.

5. A Diversified Group Teaching Optimization Algorithm with a Segment-Based Fitness Strategy for UAV

Route Planning [Paper]
• *Journal:* Expert Systems with Applications (SCI Q1, 2021)
• *Authors:* Y. Jiang, Q. Wu, G. Zhang, S. Zhu, W. Xing
• *Summary:* Develops Diversified Group Teaching Optimization Algorithm with novel teaching methods for safe, efficient UAV route planning in complex 3D obstacle environments.

6. A Novel Multi-Objective Group Teaching Optimization Algorithm and Its Application to Engineering Design [Paper]
   • *Journal:* Computers & Industrial Engineering (SCI Q1, 2021)
   • *Authors:* S. Zhu, Q. Wu, Y. Jiang, W. Xing
   • *Summary:* Extends Group Teaching Optimization to MOGTOA using Pareto dominance and hybrid search for superior multi-objective optimization on benchmarks and engineering designs.

Publications (Under Review)

1. VTFusion: A Vision-Text Multimodal Fusion Network for Few-Shot Anomaly Detection
   • *Journal:* IEEE Transactions on Cybernetics (SCI Q1)
   • *Authors:* Y. Jiang, Y. Cao, Y. Cheng, Y. Zhang, W. Shen
   • *Summary:* Presents VTFusion with adaptive extractors and cross-modal fusion to bridge vision-text gaps for few-shot anomaly detection on limited normal samples.

2. Bidirectional Adaptive Transformers for Multimodal Anomaly Detection
   • *Journal:* Computers in Industry (SCI Q1)
   • *Authors:* Y. Jiang, Y. Cao, W. Shen
   • *Summary:* Introduces Bidirectional Adaptive Transformers with mutual feature alignment for semantic-rich multimodal anomaly detection on RGB images and 3D point clouds.

Selected Patents

1. A Method for Industrial Defect Detection Based on Masked Reverse Knowledge Distillation (Patent Number: 202310570502.7)
2. A Discriminative Segmentation Network Guided by Prototype Learning for Few-Shot Industrial Defect Detection (Patent Number: 202311254405.3)
3. A Method and System for Block Shooting and Effective Region Extraction in Automated Image Defect Detection (Patent Number: 202311251098.3)
4. A Multimodal Fusion Network Based on Synthetic Defects for Few-Shot Defect Detection (Patent Number: 202410290896.5)

Selected Awards & Honors

1. National Scholarship for Master's Students (the highest scholarship for master's students) Nov. 2024
2. National Scholarship for Bachelor's Students (the highest scholarship for bachelor's students) Sep. 2019

Professional Skills

Programming: Python, PyTorch, MATLAB, C++ etc.

Language: IELTS 6.5