Qiyu Chen

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Education

Institute of Automation, Chinese Academy of Sciences — Beijing, China
Direct Ph.D. Student, Pattern Recognition and Intelligent Systems; Supervisor: Prof. Zhengtao Zhang — *Sep. 2021 – Jul. 2026*

Tongji University — Shanghai, China
B.Eng., Communication Engineering, College of Electronics and Information Engineering — *Sep. 2017 – Jul. 2021*

Projects

[1] Data Generation and Optimization for Open-Domain Visual Anomaly Detection Jan. 2025 – Aug. 2025
- Technical contributor on NSFC projects 62303458 and 62303461; improved cross-domain anomaly detection accuracy by 5%.
- Proposed conditional prompt synthesis with image-text matching, local normal/abnormal prototypes, VAE-based global feature sampling, and CLIP prompt tuning.
- Resulted in a first-author CVPR Findings paper and open-source code.

[2] Multi-Class Anomaly Representation Learning Based on Visual Perception Jun. 2024 – Dec. 2024
- Technical contributor on National Key R&D Program project; achieved 3x faster inference with a unified multi-class model.
- Designed center-aware residual anomaly synthesis to constrain abnormal feature variance and reduce inter-class interference.
- Resulted in a first-author IEEE TII paper and an authorized first-author invention patent.

[3] Highly Adaptive Anomaly Detection Driven by Normal Samples Oct. 2023 – May 2024
- Principal technical lead for an aerospace composite inspection project; reduced performance fluctuation by 1x under OOD anomaly patterns.
- Developed progressive boundary anomaly synthesis with self-supervised learning and lightweight feature enhancement.
- Resulted in a first-author IEEE TCSVT paper and an authorized first-author invention patent.

[4] Unsupervised Image Segmentation for Low-Contrast Anomalies Oct. 2022 – Sep. 2023
- Principal technical lead for a Weiqiao Textile university-industry project; achieved 99.9% domain-level SOTA performance for subtle fabric defects.
- Proposed dual-branch anomaly synthesis with Gaussian feature perturbation and gradient-ascent guidance.
- Resulted in a first-author ECCV paper and a published first-author invention patent.

Publications

[1] A Unified Anomaly Synthesis Strategy with Gradient Ascent for Industrial AD and Localization ECCV
- **Authors**: Qiyu Chen, Huiyuan Luo, Chengkan Lv, Zhengtao Zhang [Paper] [Code]

[2] Progressive Boundary Guided Anomaly Synthesis for Industrial Anomaly Detection IEEE TCSVT
- **Authors**: Qiyu Chen, Huiyuan Luo, Han Gao, Chengkan Lv, Zhengtao Zhang [Paper] [Code]

[3] Center-aware Residual Anomaly Synthesis for Multiclass Industrial Anomaly Detection IEEE TII
- **Authors**: Qiyu Chen, Huiyuan Luo, Haiming Yao, Wei Luo, Zhen Qu, et al. [Paper] [Code]

[4] CoPS: Conditional Prompt Synthesis for Zero-Shot Anomaly Detection CVPR Findings
- **Authors**: Qiyu Chen, Zhen Qu, Wei Luo, Haiming Yao, Yunkang Cao, et al. [Paper] [Code]

[5] Distributed Integrated Intelligent Pot Using Remote Monitor and Control System CSA
- **Authors**: Qiyu Chen, Tianming Li, Shengyue Wang, Mingzhong Huang [Paper]

[6] The Remote Intelligent Virtual Reality Monitoring and Control System for Flower Maintenance CSA
- **Authors**: Qiyu Chen, Peng Gong, Renchun Guo, Gaojian Zhang [Paper]

[7] TDSS: Task Dynamic-Synergistic Skill Adaptation for Efficient and Scalable Multi-Task Learning AAAI
- **Authors**: Haiming Yao, Qiyu Chen, Wei Luo, Zheng Zhang, Jianxing Liao, et al. [Paper]

[8] MRAD: Zero-Shot Anomaly Detection With Memory-Driven Retrieval ICLR
- **Authors**: Chaoran Xu, Chengkan Lv, Qiyu Chen, Feng Zhang, Zhengtao Zhang [Paper] [Code]

[9] Parameter-, Memory-, Time-Efficient Multi-Task Dense Vision Adaptation AAAI
- **Authors**: Haiming Yao, Wei Luo, Qiyu Chen, Jianxing Liao, Wei You [Paper]

[10] Anomagic: Crossmodal Prompt-driven Zero-shot Anomaly Generation AAAI
- **Authors**: Yuxin Jiang, Wei Luo, Hui Zhang, Qiyu Chen, Haiming Yao, et al. [Paper] [Code]

[11] Bayesian Prompt Flow Learning for Zero-Shot Anomaly Detection CVPR
- **Authors**: Zhen Qu, Xian Tao, Xinyi Gong, Shichen Qu, Qiyu Chen, et al. [Paper] [Code]

Patents

[1] Remote Intelligent Flower-Watering System Based on Virtual Reality Technology CN105532390B
[2] Multi-Point Sampling Device and UAV Carrying the Multi-Point Sampling Device CN111551401B
[3] Intelligent Flowerpot Control System, Flowerpot, and Control Method CN111657003B
[4] Defect Detection Method, System, Device, and Computer-Readable Storage Medium CN118279280B
[5] Fabric Surface Defect Detection Method and Related Apparatus CN119810058B

Awards & Honors

[1] First Prize, China Intelligent Robot Fighting Competition National
[2] Second Prize, Chinese Collegiate Computing Design Competition National
[3] Third Prize, National University Intelligent Car Race National
[4] First Prize, CAS Industrial Vision Achievement Scholarship University
[5] Second Prize, CASIA Climbing Scholarship University
[6] Merit Student, University of Chinese Academy of Sciences University
[7] Outstanding Graduate, Tongji University University
[8] Vice President, College of Electronics and Information Engineering, Tongji University College