GUOYANG XIE

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SHORT BIO

I currently serve as **Senior AI Algorithm Manager** in the Software & Algorithm Team under CATL's Intelligent Manufacturing Department, leading a core algorithm group focused on deploying cutting-edge AI technologies to battery quality inspection and battery pack thermal simulation businesses. In 2024, I spearheaded CATL's highest-tier technical project, which earned me three key recognitions: the **President's Bonus Award** (CATL's top honor), the company-level technical award **Innovation Star**, and a top performance rating of A. Additionally, I hold the position of **Editor-in-Chief at IEEE Data Descriptions**. I have published 27 papers in top-tier AI conferences and journals, including NeurIPS, ICML, ICLR, AAAI, ECCV, ACM MM, IEEE TIP, IEEE TCYB, and ACM Computing Surveys

EDUCATION

- University of Surrey, Machine Learning PhD, 2019.10-2023.10,
- Hong Kong University of Science and Technology, MPhil(Major:Robotics), 2013.09-2015.09
- University of Electronic Science and Technology of China, Bachelor(Electronic Engineering), 2009.9-2013.06

WORK EXPERIENCE

SENIOR AI ALGORITHM MANAGER, SOFTWARE & ALGORITHM GROUP, INTELLIGENT MANUFACTURING DEPARTMENT, CATL, DECEMBER 2023-PRESENT

1.1000x Compression Technology for Full-Scale Quality Inspection Image Storage | Project Manager | Recipient of President's Award

- Designed a 1000X compression technology, cutting hardware storage costs by **RMB 1.03 billion**
- Commercialized the compression software and built up the traceability platform; Overseas electric vehicle manufacturers have paid an advance of **RMB 80 million**.
- Extended cloud-based image traceability from 7 days to 6 months (25x improvement), reducing annual customer complaint costs by **RMB 43 million**.
- Implemented AI secondary review, eliminating 90% of redundant data and improving human efficiency by **10x.**

2.Data Flywheel for Visual Inspection during Changeover | Project Manager

- Developed anomalies synthesis algorithm, slashing defect data collection time from 5 days to **1.5 hours**
- Established a data flywheel to fully automate the original workflow (annotation->training->evaluation-> model deployment), shortening AI switching time for visual quality inspection from

3 days to 1 hour. Deployed in overseas production lines, this technology saved **RMB 51.89 million** in temporary visual inspection labor costs.

3.Unsupervised Anomaly Detection for Cell Appearance Inspectors, Algorithm Leader

- Scaled deployment across **30 production lines** for cell appearance inspection machines. Achieves ultra-high recognition rates for unpredictable/unseen defects, lowering the miss rate to **0.05%**.
- Eliminated the need for defect sample collection in AI model training (only 100 "OK" samples required), saving **RMB 1 million** in data collection labor costs and reducing CCD switching time to **10 minutes**.
- Minimized computational power requirements, enabling on-edge training via inference-training integrated machines. Cuts GPU costs by **RMB 500** per industrial computer, with estimated total savings of **RMB 23 million** in industrial computer procurement.

PRINCIPLE PERCEPTION ALGORITHM ENGINEER, GAC, GUANGZHOU 2017.12-2019.9

1. Build a comprehensive perception benchmark for L3 and L4 Level Autonomous Driving, including:

- Highway lane detection benchmark
- Free-space semantic segmentation benchmark
- Highway object-detection benchmark

2. Intelligent Parking-Assist Algorithm, including:

- Visual simultaneous localization and mapping algorithm
- Visual object detection algorithm

3. Build a large-scale dataset for L3/L4 autonomous driving tasks, including:

- Highway semantic segmentation
- Real-time object detection

SENIOR PERCEPTION ALGORITHM ENGINEER, BAIDU, BEIJING – 2015.11-2017.11

1. Deep Learning-based 3D object detection

Random forest tree-based 3D object classification

End-to-end 3D point cloud object detection, classification and tracking

PUBLICATION (*: CONTRIBUTED EQUALLY, #: CORRESPONDING AUTHOR)

Xichen Xu, Yanshu Wang, Jinbao Wang, Xiaoning Lei, **Guoyang Xie#,** Guannan Jiang, Zhichao Lu, “FAST：Fourground-aware Diffusion with Accelerated Sampling Trajectory for Segmentation-oriented Anomaly Synthesis”, (NeurIPS 2025）

Sicheng Zhang, Binzhu Xie, Zhonghao Yan, Yuli Zhang, Donghao Zhang, Xiaofei Chen, Shi Qiu, Jiaqi Liu, **Guoyang Xie#**, Zhichao Lu, "Trade-offs in Image Generation: How Do Different Dimensions Interact?", (ICCV 2025)

Lianbo Ma, Jianlun Ma, Yuee Zhou, **Guoyang Xie#**, Qiang He, Zhichao Lu, "Learning from Loss Landscape: Generalizable Mixed-Precision Quantization via Adaptive Sharpness", (ICML 2025)

Kaifang Long, **Guoyang Xie**, Lianbo Ma, Qing Li, Min Huang, Jianhui Lv, Zhichao Lu, "Enhancing Multimodal Learning via Hierarchical Fusion Architecture Search with Inconsistency Mitigation", (IEEE Transaction on Image Processing 2025）

Kaifang Long, **Guoyang Xie**, Lianbo Ma, Jiaqi Liu, Zhichao Lu, "Revisiting Multimodal Fusion for 3D Anomaly Detection from an Architectural Perspective", (AAAI 2025)

Hongze Zhu, **Guoyang Xie**, Chengbin Hou, Bingshu Wang, Can Gao, Jinbao Wang, "Look Inside for More: Internal Spatial Modality Perception for 3D Anomaly Detection", (AAAI 2025)

Zhonghang Liu, Panzhong Lu, **Guoyang Xie**, Zhichao Lu, Wen-Yan Lin, "Rethinking Unsupervised Outlier Detection via Multiple Thresholding", (ACM MM 2024)

Zhuohao Li, **Guoyang Xie**, Guannan Jiang, Zhichao Lu, "ShadowMaskFormer: Mask Augmented Patch Embeddings for Shadow Removal", (IEEE Transaction on Artificial Intelligence 2024)

Guoyang Xie*, Jinbao Wang*, Jiaqi Liu, Yaochu Jin and Feng Zheng, "Pushing the Limits of Few Shot Anomaly Detection in Industry Vision: Graphcore", (ICLR 2023)

Guoyang Xie*, Jiaqi Liu*, Ruitao Chen*, Xinpeng Li, Jinbao Wang, Yong Liu, and Feng Zheng , "Real3D-AD: A Dataset of Point Cloud Anomaly Detection", (NeurIPS 2023)

Guoyang Xie*, Ruitao Chen*, Jiaqi Liu*, Jinbao Wang, Ziqi Luo, Jinfan Wang and Feng Zheng, "EasyNet: An Easy Network for 3D Industrial Anomaly Detection", (ACM MM, CCF-A)

Guoyang Xie*, Jinbao Wang*, Jiaqi Liu*, Jiayi Lyu, Yong Liu, Chengjie Wang, Feng Zheng, and Yaochu Jin, "IM-IAD: Industrial Image Anomaly Detection Benchmark in Manufacturing", (IEEE Transactions on Cybernetics, 2023)

Guoyang Xie*, Jinbao Wang*, Yawen Huang*, Yefeng Zheng, Yaochu Jin and Feng Zheng, "FedMed-ATL: Misaligned Unpaired Cross-Modality Neuroimage Synthesis via Transform Loss", (ACM MM 2023,)

Guoyang Xie, Tao Xu, Carsten Isert, Michael Aeberhard, Shaohua Li and M.Liu, "Online Active Calibration for a Multi-LRF System", (ITSC 2015)

Guoyang Xie*, Yawen Huang*, Jinbao Wang, Jiayi Lyu, Feng Zheng, Yefeng Zheng, and Yaochu Jin, "Cross-Modality Neuroimage Synthesis: A Survey", (ACM Computing Surveys 2023)

SERVICE

- 2020-2023, CAIS Reviewer
- 2022, AAAI Reviewer

- 2023, NeurIPS Reviewer
- 2023, TEVC Reviewer
- 2023, ACM MM Reviewer
- 2023, ICLR Reviewer
- 2023, TETCI Reviewer
- 2023, TNNLS Reviewer

SKILLS

Programming Language: Python, Latex, Matlab

Language: Cantonese, Mandarin, English

GITHUB REPOS

- Open-IAD: https://github.com/M-3LAB/open-iad
- FedMed-GAN: https://github.com/M-3LAB/FedMed-GAN
- Awesome Industrial Image Anomaly Detection: https://github.com/M-3LAB/awesome-industrial-anomaly-detection
- Brain-GAN Survey: https://github.com/M-3LAB/awesome-multimodal-brain-image-systhesis