Xiaoyang Wang

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Research Interests

Label-efficient Learning: Developing AI models that maximize the use of unlabeled data to enhance generalization in discriminative tasks such as classification and semantic segmentation.

Industrial Anomaly Detection: Designing AI models for visual inspection in quality control processes, particularly in scenarios with limited anomaly data and annotations.

Education

University of Liverpool *Sep 2020 to Dec 2024*
PhD in Electrical Engineering and Electronics

- Thesis title: Label-efficient Semantic Segmentation and Visual Anomaly Detection

University of Edinburgh *Sep 2018 to Sep 2019*
MSc in Artificial Intelligence

- Thesis title: Image-based 3D Pose Reconstruction of a Continuum Flexible Robot

Xi'an Jiaotong-Liverpool University *Sep 2014 to Sep 2018*
BEng in Electrical Engineering (with Honours)

- Academic Achievement Scholarship (2016–2018) – Top 10%

Experience

Research Engineer *Oct 2023 to Dec 2024*
Dinnar Automation, AI Center

- Conducting research on industrial anomaly detection, focusing on applications in consumer electronics.
- Developing few-shot and unsupervised anomaly detection algorithms to reduce model dependency on annotated data and enhance training efficiency.
- Led a team of three and secured 3rd place in the One-Shot Industrial Defect Segmentation Challenge (ECCV 2024). The announcement and technical report can be accessed here.

Algorithm Engineer Intern *Oct 2019 to May 2020*
Philips Healthcare, Clinical Science

- Developed an end-to-end training pipeline for deep learning-based brain lesion segmentation.
- Conducted research on multi-center MRI datasets to analyze the impact of lesion properties on model performance; drafted and published a research article.
- Developed a UI incorporating the trained segmentation model, offering visualization, editing, and volume calculation functionalities to assist clinical workflows.

Selected Publications

*: equal contribution

1. CARD: Semi-supervised Semantic Segmentation via Class-agnostic Relation-based Denoising.
   Xiaoyang Wang, Jimin Xiao, Bingfeng Zhang, and Limin Yu.
   International Joint Conference on Artificial Intelligence (IJCAI), 2022

2. Hunting Sparsity: Density-Guided Contrastive Learning for Semi-supervised Semantic Segmentation.
   Xiaoyang Wang, Bingfeng Zhang, Limin Yu, and Jimin Xiao.
   Conference on Computer Vision and Pattern Recognition (CVPR), 2023

3. FastRecon: Few-shot Industrial Anomaly Detection via Fast Feature Reconstruction.
   Zheng Fang*, **Xiaoyang Wang***, and Jimin Xiao.
   International Conference on Computer Vision (ICCV), 2023

4. Density-Descending Feature Perturbation for Semi-supervised Semantic Segmentation.
   Xiaoyang Wang, Huihui Bai, Limin Yu, Yao Zhao, and Jimin Xiao.
   Conference on Computer Vision and Pattern Recognition (CVPR), 2024

5. CNC: Cross-modal Normality Constraint for Unsupervised Multi-class Anomaly Detection.
   Xiaolei Wang*, **Xiaoyang Wang***, Huihui Bai, ENG GEE LIM, and Jimin Xiao.
   AAAI Conference on Artificial Intelligence (AAAI), 2025

Skills

Programming: Python, C/C++

Software & Frameworks: PyTorch, TensorFlow, OpenCV, Scikit-learn, MATLAB

Academic Services

Journal Reviewer:

Transactions on Circuits and Systems for Video Technology (TCSVT)	since 2024
Transactions on Multimedia (TMM)	since 2024
Transactions on Knowledge and Data Engineering (TKDE)	since 2024
Transactions on Neural Networks and Learning Systems (TNNLS)	since 2024