3 Other Research Direction

3.1 Few-Shot AD

- Learning unsupervised metaformer for anomaly detection [ICCV 2021]
- Registration based few-shot anomaly detection [ECCV 2022 oral][code]
- Same same but differnet: Semi-supervised defect detection with normalizing flows [(Distribution)WACV 2021]
- Towards total recall in industrial anomaly detection [(Memory bank)CVPR 2022]
- A hierarchical transformation-discriminating generative model for few shot anomaly detection [ICCV 2021]
- Anomaly detection of defect using energy of point pattern features within random finite set framework [2021]
- Optimizing PatchCore for Few/many-shot Anomaly Detection [2023][code]
- AnomalyGPT: Detecting Industrial Anomalies using Large Vision-Language Models [AAAI 2024] [code][project page]
- FastRecon: Few-shot Industrial Anomaly Detection via Fast Feature Reconstruction [ICCV 2023] [code comming soon]
- Produce Once, Utilize Twice for Anomaly Detection [2023]
- COFT-AD: COntrastive Fine-Tuning for Few-Shot Anomaly Detection [TIP2024]
- Text-Guided Variational Image Generation for Industrial Anomaly Detection and Segmentation [CVPR 2024]
- Multimodal Industrial Anomaly Detection by Crossmodal Feature Mapping [CVPR 2024]
- Dual-path Frequency Discriminators for Few-shot Anomaly Detection [2024]

Zero-Shot AD

- Random Word Data Augmentation with CLIP for Zero-Shot Anomaly Detection [BMVC 2023]
- Zero-Shot Batch-Level Anomaly Detection [2023]
- Zero-shot versus Many-shot: Unsupervised Texture Anomaly Detection [WACV 2023]
- MAEDAY: MAE for few and zero shot AnomalY-Detection [2022]
- WinCLIP: Zero-/Few-Shot Anomaly Classification and Segmentation [CVPR 2023]
- Segment Any Anomaly without Training via Hybrid Prompt Regularization [2023] [code]
- Anomaly Detection in an Open World by a Neuro-symbolic Program on Zero-shot Symbols [IROS

2022 Workshop]

- APRIL-GAN: A Zero-/Few-Shot Anomaly Classification and Segmentation Method for CVPR 2023 VAND Workshop Challenge Tracks 1&2: 1st Place on Zero-shot AD and 4th Place on Few-shot AD [CVPR 2023 VAND Workshop Challenge]
- AnoVL: Adapting Vision-Language Models for Unified Zero-shot Anomaly Localization [2023] [code]
- CLIP-AD: A Language-Guided Staged Dual-Path Model for Zero-shot Anomaly Detection [2023]
- PromptAD: Zero-shot Anomaly Detection using Text Prompts [WACV 2024]
- High-Fidelity Zero-Shot Texture Anomaly Localization Using Feature Correspondence Analysis [WACV 2024]
- AnomalyCLIP: Object-agnostic Prompt Learning for Zero-shot Anomaly Detection [ICLR 2024] [code]
- MuSc: Zero-Shot Anomaly Classification and Segmentation by Mutual Scoring of the Unlabeled Images[ICLR 2024][code]
- ClipSAM: CLIP and SAM Collaboration for Zero-Shot Anomaly Segmentation [2023]
- APRIL-GAN: A Zero-/Few-Shot Anomaly Classification and Segmentation Method for CVPR 2023 VAND Workshop Challenge Tracks 1&2: 1st Place on Zero-shot AD and 4th Place on Few-shot AD [2023]
- Model Selection of Zero-shot Anomaly Detectors in the Absence of Labeled Validation Data [2024]
- Toward Generalist Anomaly Detection via In-context Residual Learning with Few-shot Sample Prompts [CVPR 2024][code]

3.2 Noisy AD

- Trustmae: A noise-resilient defect classification framework using memory-augmented auto-encoders with trust regions [WACV 2021]
- Self-Supervise, Refine, Repeat: Improving Unsupervised Anomaly Detection [TMLR 2021]
- Data refinement for fully unsupervised visual inspection using pre-trained networks [2022]
- Latent Outlier Exposure for Anomaly Detection with Contaminated Data [ICML 2022]
- Deep one-class classification via interpolated gaussian descriptor [AAAI 2022 oral][code]
- SoftPatch: Unsupervised Anomaly Detection with Noisy Data [NeurIPS 2022])[code]
- Inter-Realization Channels: Unsupervised Anomaly Detection Beyond One-Class Classification [ICCV 2023][code]

3.3 Anomaly Synthetic

- Cutpaste: Self-supervised learning for anomaly detection and localization [(OCC)ICCV 2021] [unofficial code]
- Draem-a discriminatively trained reconstruction embedding for surface anomaly detection [(Reconstruction AE)ICCV 2021][code]
- MemSeg: A semi-supervised method for image surface defect detection using differences and commonalities [(OCC)2022][unofficial code]
- A High-Efficiency Fully Convolutional Networks for Pixel-Wise Surface Defect Detection [IEEE Access 2019]
- Multistage GAN for fabric defect detection [2019]
- Gan-based defect synthesis for anomaly detection in fabrics [2020]
- Defect image sample generation with GAN for improving defect recognition [2020]
- Defective samples simulation through neural style transfer for automatic surface defect segment [2020]
- A simulation-based few samples learning method for surface defect segmentation [2020]
- Synthetic data augmentation for surface defect detection and classification using deep learning [2020]
- Defect Transfer GAN: Diverse Defect Synthesis for Data Augmentation [BMVC 2022]
- Defect-GAN: High-fidelity defect synthesis for automated defect inspection [2021]
- EID-GAN: Generative Adversarial Nets for Extremely Imbalanced Data Augmentation[TII 2022]
- Multilevel Saliency-Guided Self-Supervised Learning for Image Anomaly Detection [2023]
- AnomalyDiffusion: Few-Shot Anomaly Image Generation with Diffusion Model [AAAI 2024][code]
- RealNet: A Feature Selection Network with Realistic Synthetic Anomaly for Anomaly Detection [CVPR 2024][code]
- Dual-path Frequency Discriminators for Few-shot Anomaly Detection [2024]
- A Novel Approach to Industrial Defect Generation through Blended Latent Diffusion Model with Online Adaptation [2024][code]
- A Comprehensive Augmentation Framework for Anomaly Detection [AAAI 2024]

3.4 3D AD

- Anomaly detection in 3d point clouds using deep geometric descriptors [WACV 2022]
- Back to the feature: classical 3d features are (almost) all you need for 3D anomaly detection [2022][code]

- Anomaly Detection Requires Better Representations [2022]
- Asymmetric Student-Teacher Networks for Industrial Anomaly Detection [WACV 2022]
- Multimodal Industrial Anomaly Detection via Hybrid Fusion [CVPR 2023]
- Complementary Pseudo Multimodal Feature for Point Cloud Anomaly Detection [2023][code]
- Image-Pointcloud Fusion based Anomaly Detection using PD-REAL Dataset [2023][data]
- Towards Scalable 3D Anomaly Detection and Localization: A Benchmark via 3D Anomaly Synthesis and A Self-Supervised Learning Network [CVPR 2024][code]
- Shape-Guided Dual-Memory Learning for 3D Anomaly Detection [ICML 2023]
- EasyNet: An Easy Network for 3D Industrial Anomaly Detection [ACM MM 2023]
- Real3D-AD: A Dataset of Point Cloud Anomaly Detection [NeurIPS 2023][data]
- Self-supervised Feature Adaptation for 3D Industrial Anomaly Detection [2024]
- Cheating Depth: Enhancing 3D Surface Anomaly Detection via Depth Simulation [WACV 2024] [code]
- Incremental Template Neighborhood Matching for 3D anomaly detection [Neurocomputing 2024]
- Rethinking Reverse Distillation for Multi-Modal Anomaly Detection [AAAI 2024]
- Multimodal Industrial Anomaly Detection by Crossmodal Feature Mapping [CVPR 2024]
- PointCore: Efficient Unsupervised Point Cloud Anomaly Detector Using Local-Global Features [2024]

3.5 Continual AD

- Towards Total Online Unsupervised Anomaly Detection and Localization in Industrial Vision [2023]
- Towards Continual Adaptation in Industrial Anomaly Detection [ACM MM 2022]
- An Incremental Unified Framework for Small Defect Inspection [2023][code]
- Unsupervised Continual Anomaly Detection with Contrastively-learned Prompt [AAAI 2024][code]

3.6 Uniform/Multi-Class AD

- A Unified Model for Multi-class Anomaly Detection [NeurIPS 2022] [code]
- OmniAL A unifiled CNN framework for unsupervised anomaly localization [CVPR 2023]
- SelFormaly: Towards Task-Agnostic Unified Anomaly Detection[2023]
- Hierarchical Vector Quantized Transformer for Multi-class Unsupervised Anomaly Detection [NeurIPS 2023][code]
- Removing Anomalies as Noises for Industrial Defect Localization [ICCV 2023]

- UniFormaly: Towards Task-Agnostic Unified Framework for Visual Anomaly Detection [2023][code]
- MSTAD: A masked subspace-like transformer for multi-class anomaly detection [2023]
- LafitE: Latent Diffusion Model with Feature Editing for Unsupervised Multi-class Anomaly Detection [2023]
- DiAD: A Diffusion-based Framework for Multi-class Anomaly Detection [AAAI 2024][code]
- Exploring Plain ViT Reconstruction for Multi-class Unsupervised Anomaly Detection [2023]
- Structural Teacher-Student Normality Learning for Multi-Class Anomaly Detection and Localization [2024]
- Unsupervised anomaly detection and localization with one model for all category [KBS 2024]
- Anomaly Detection by Adapting a pre-trained Vision Language Model [2024]
- DMAD: Dual Memory Bank for Real-World Anomaly Detection [2024]
- Toward Multi-class Anomaly Detection: Exploring Class-aware Unified Model against Inter-class Interference [2024]
- Hierarchical Gaussian Mixture Normalizing Flow Modeling for Unified Anomaly Detection [2024]

3.7 Logical AD

- Beyond Dents and Scratches: Logical Constraints in Unsupervised Anomaly Detection and Localization [IJCV 2022]
- Set Features for Fine-grained Anomaly Detection[2023] [code]
- SLSG: Industrial Image Anomaly Detection by Learning Better Feature Embeddings and One-Class Classification [2023]
- EfficientAD: Accurate Visual Anomaly Detection at Millisecond-Level Latencies [WACV 2024]
- Contextual Affinity Distillation for Image Anomaly Detection [WACV 2024]
- REB: Reducing Biases in Representation for Industrial Anomaly Detection [2023][code]
- Learning Global-Local Correspondence with Semantic Bottleneck for Logical Anomaly Detection [TCSVT 2023][code]
- Template-guided Hierarchical Feature Restoration for Anomaly Detection [ICCV 2023]
- Few Shot Part Segmentation Reveals Compositional Logic for Industrial Anomaly Detection [AAAI 2024]
- Generating and Reweighting Dense Contrastive Patterns for Unsupervised Anomaly Detection [AAAI 2024]
- PUAD: Frustratingly Simple Method for Robust Anomaly Detection [2024]