

Transfer Learning and ROI Guided Feature Cropping based GPU Accelerated Real-time Abnormal Level Detection in Logistics

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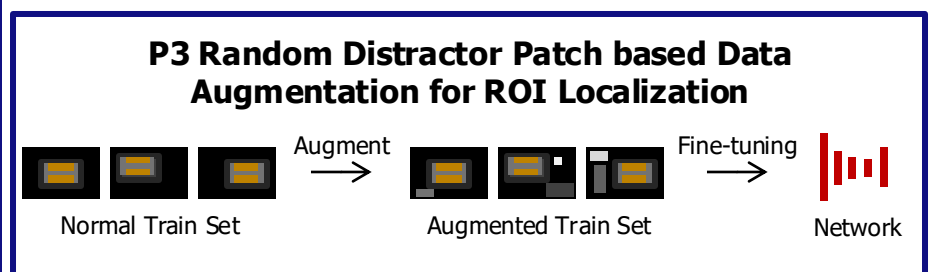
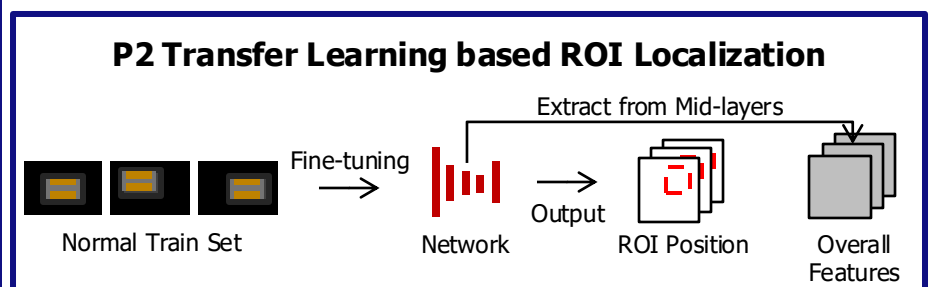
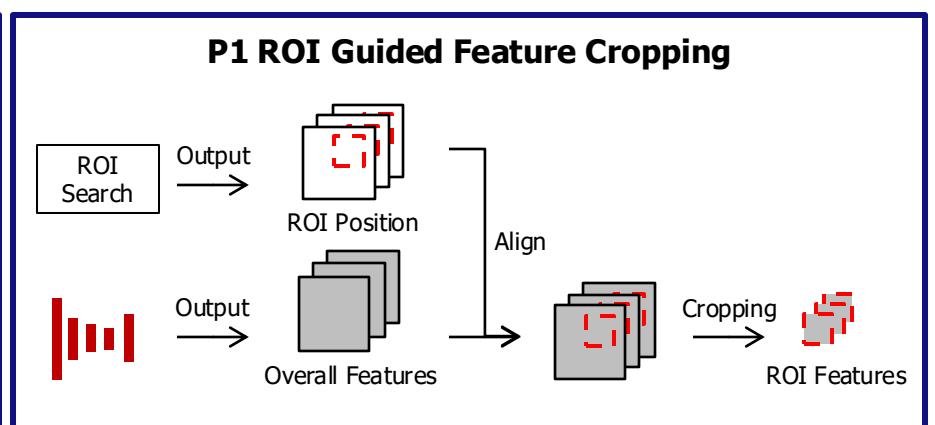
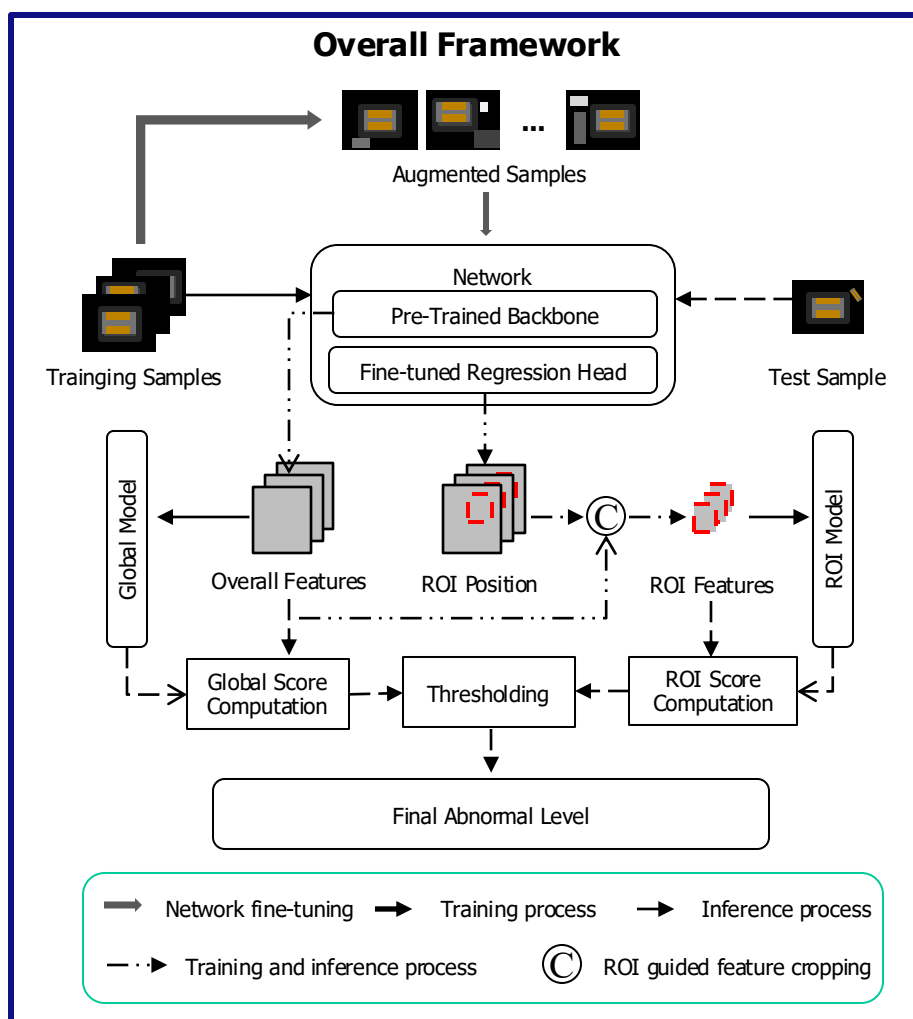
◆ Background

- In real logistics applications, abnormal cases vary in severity and therefore require different handling strategies. A real-time abnormal level detection system can provide timely and targeted responses.

◆ Challenges

- Data limitation: the randomness and rarity of abnormal cases make it difficult to obtain representative abnormal samples for modeling.
- Latency constraint: low detection latency is essential to meet the real-time requirements of real world logistics application.
- Hardware constraint: high-performance devices are not always available, necessitating lightweight and hardware-friendly detection methods for real application.

◆ Proposals



◆ Experiment Results

Method	AUROC(1st)	AUROC(2nd)	Latency
Baseline	0.998	0.974	119.1 ms
P1	0.998	0.970	100.8 ms
P1+P2	0.998	0.899	10 ms
P1+P2+P3	0.998	0.943	10 ms

◆ Conclusion

- The proposed method achieves good real-time performance compared with baseline work, with 0.998 AUROC in first round detection, 0.943 AUROC in second round detection and around 10 ms latency.

