



CVPR
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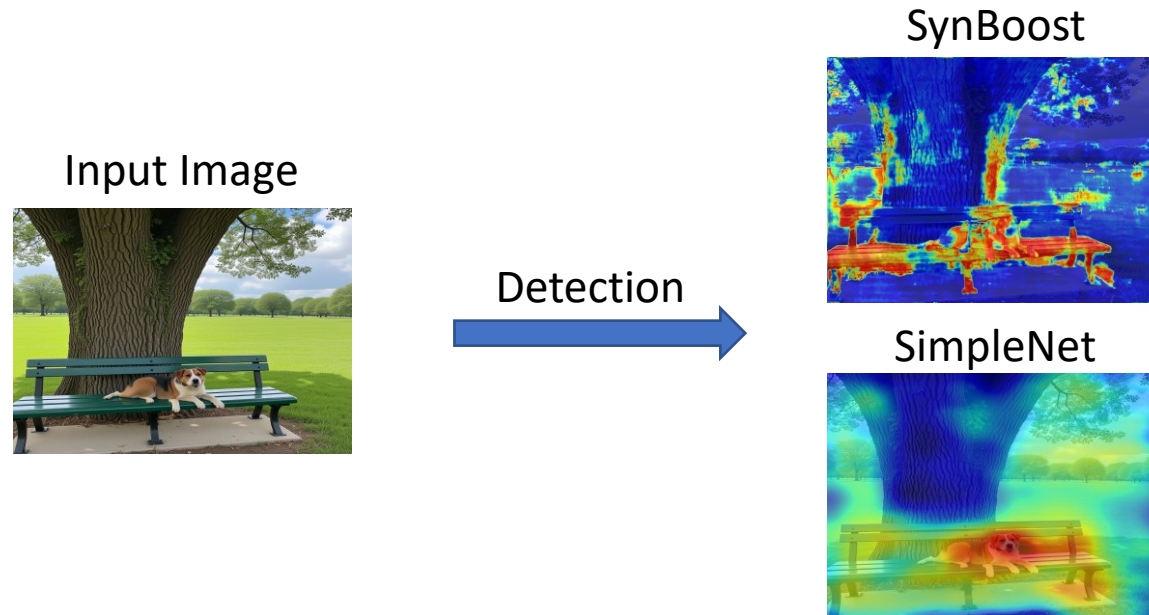
LayoutAD: Exploring Semantic-Geometric Misalignment Reasoning for Scene Layout Anomaly Detection

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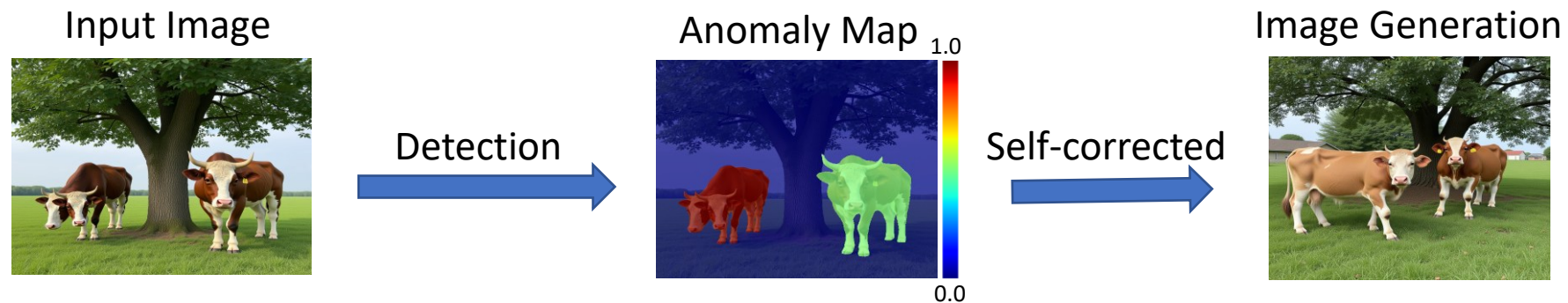
Motivation

- Existing anomaly detection methods mainly focus on pixel-level deviations, ignoring object-level structural and contextual inconsistencies. These underexplored anomalies often manifest as factually defective hallucinations in text-to-image generation.

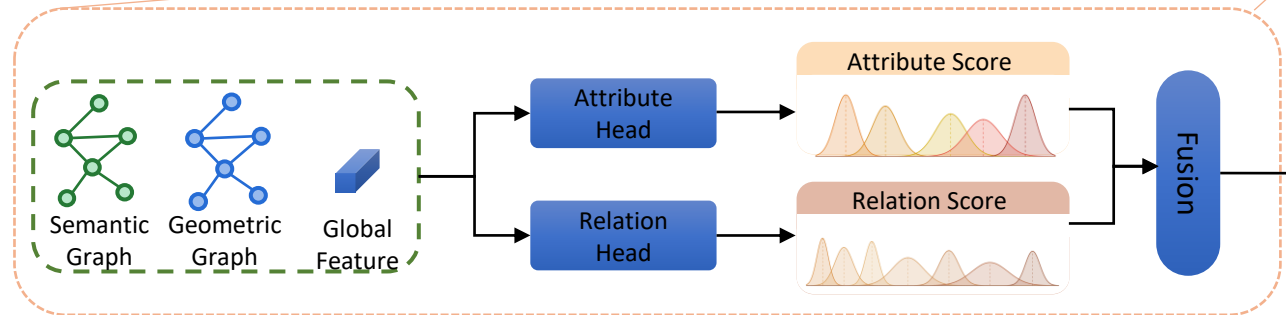
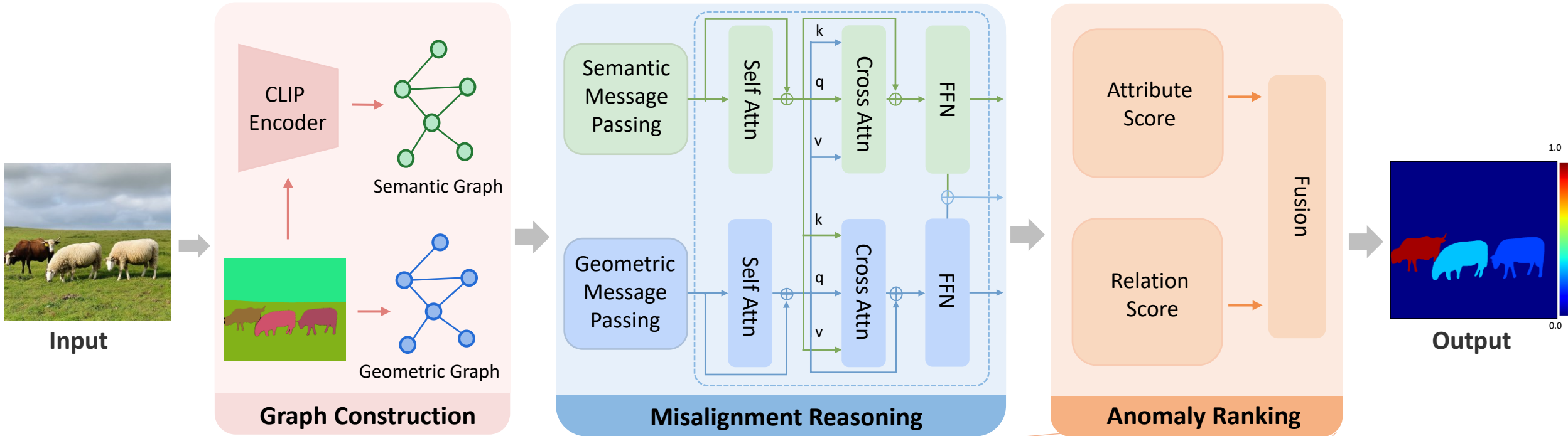


Scene Layout Anomaly Detection

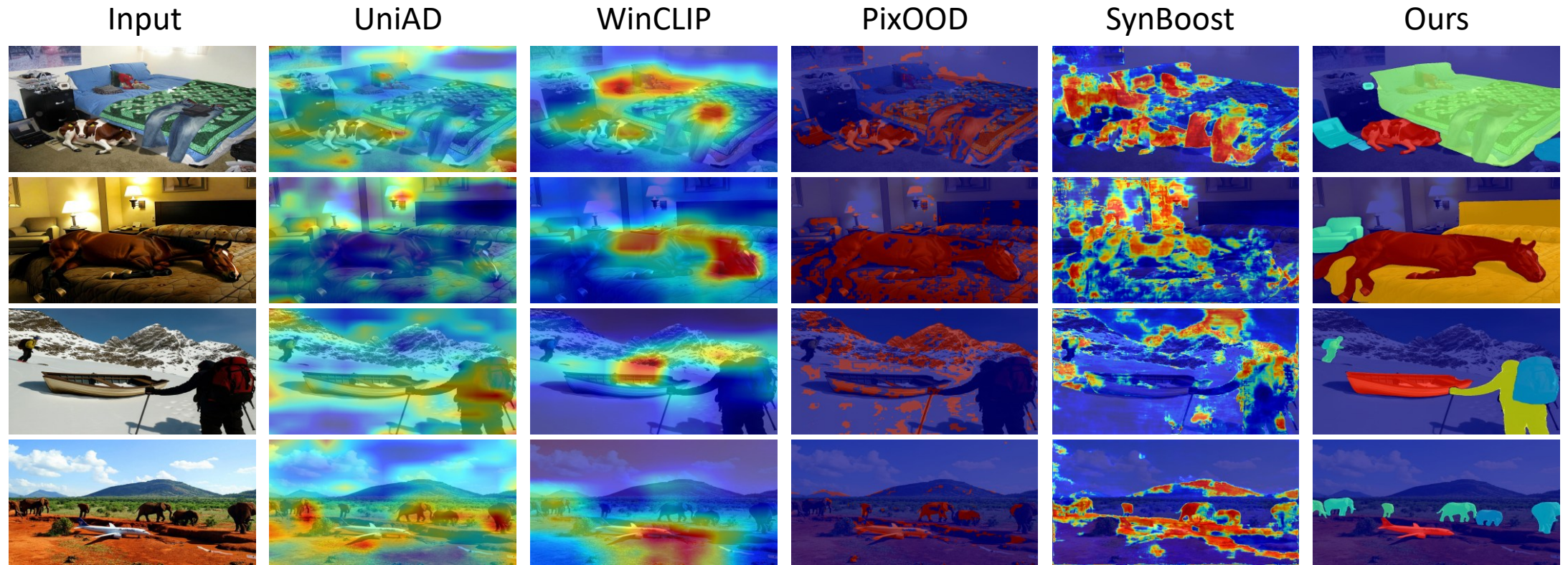
- Given a natural scene image, our goal is to predict an object-level anomaly map that indicates semantic or geometric deviations among objects.
- Detected scene layout anomalies can support various downstream applications, including scene understanding and image generation.



Approach



Qualitative Evaluation




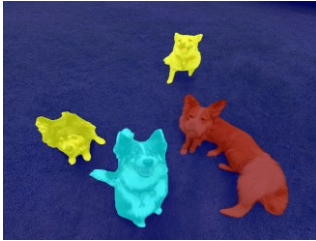





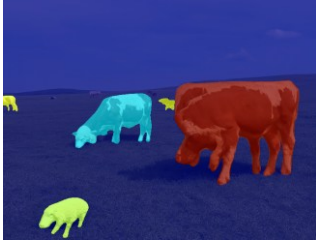


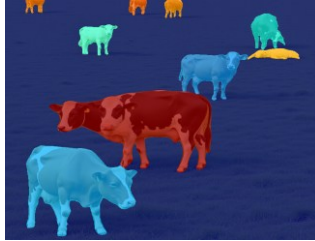






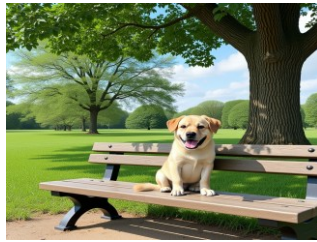


Quantitative Evaluation

Method	I-AUROC \uparrow	P-AUROC \uparrow	AP-AUROC \uparrow
PatchCore	0.539	0.571	0.565
SimpleNet	0.551	0.571	0.515
UniAD	0.479	0.575	0.508
GeneralAD	0.543	0.565	0.314
SynBoost	0.542	0.773	0.777
PixOOD	0.538	0.720	0.722
Ours	0.586	0.871	0.883

Applications

- Self-corrected Image Generation

Prompt	SD-3	LayoutAD (Ours)	SD-3 +LayoutAD	FLUX.1	LayoutAD (Ours)	FLUX.1 +LayoutAD
“four dogs on the grass.”						
“several cows and sheep are grazing.”						
“a tree, a bench, a dog.”						

Applications

- Image Anomaly Segmentation





Conclusion

- We make the first attempt to investigate the new problem of scene layout anomaly detection.
- We propose an unsupervised framework by explicitly modeling semantic and geometric interactions among objects in the scene.
- Experimental results show that our model can effectively detect diverse layout anomalies and enable various downstream applications.



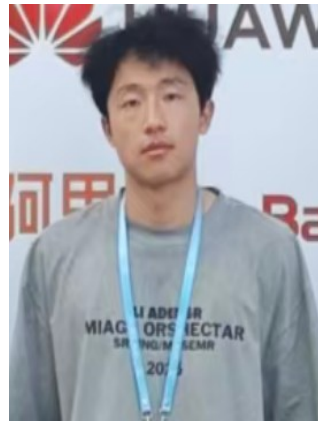
Thanks for Your Attention!



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