

Contrastive Language Prompting to Ease False Positives in Medical Anomaly Detection

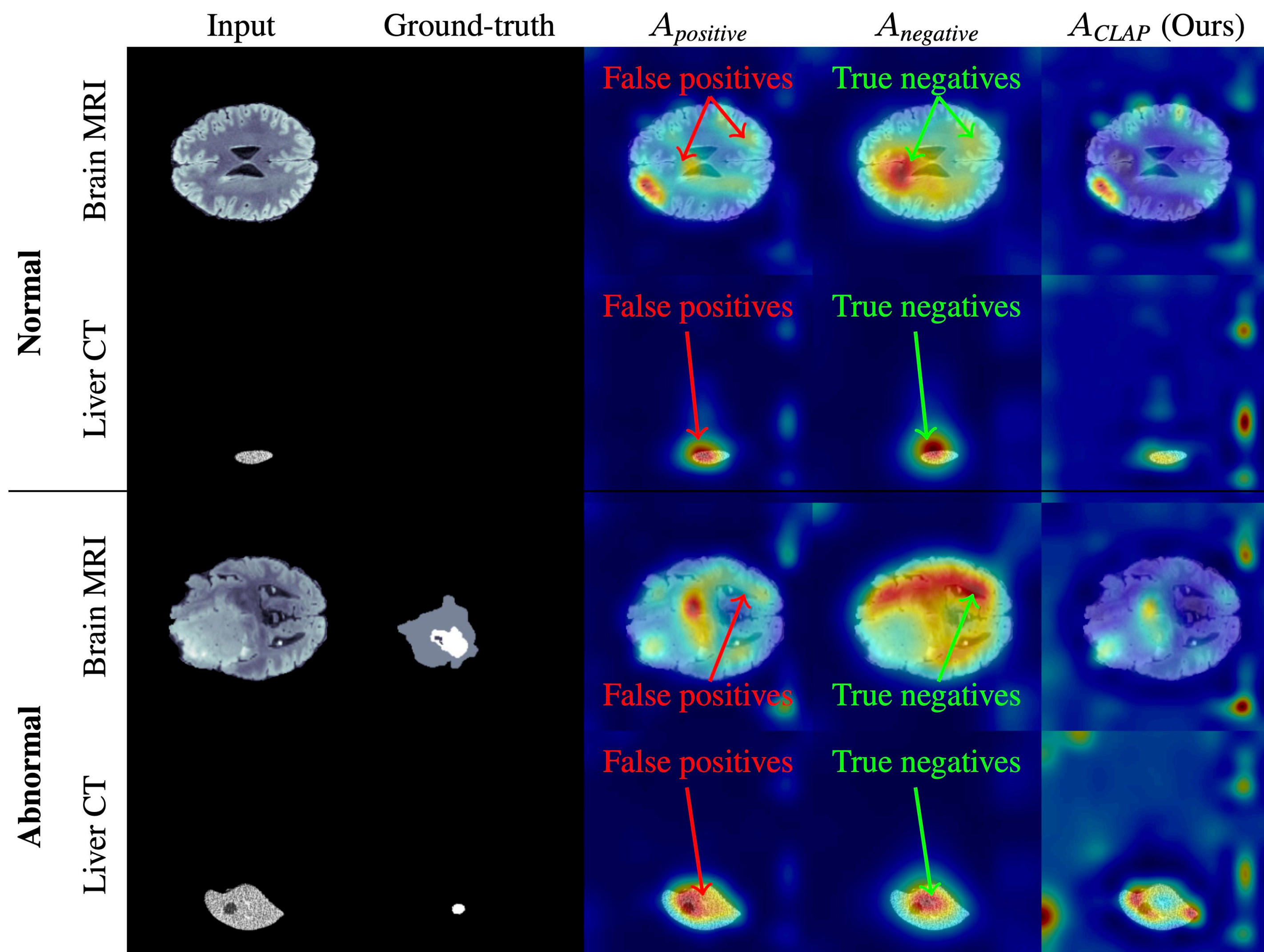
YeongHyeon Park Myung Jin Kim Hyeong Seok Kim

SK Planet Co., Ltd.



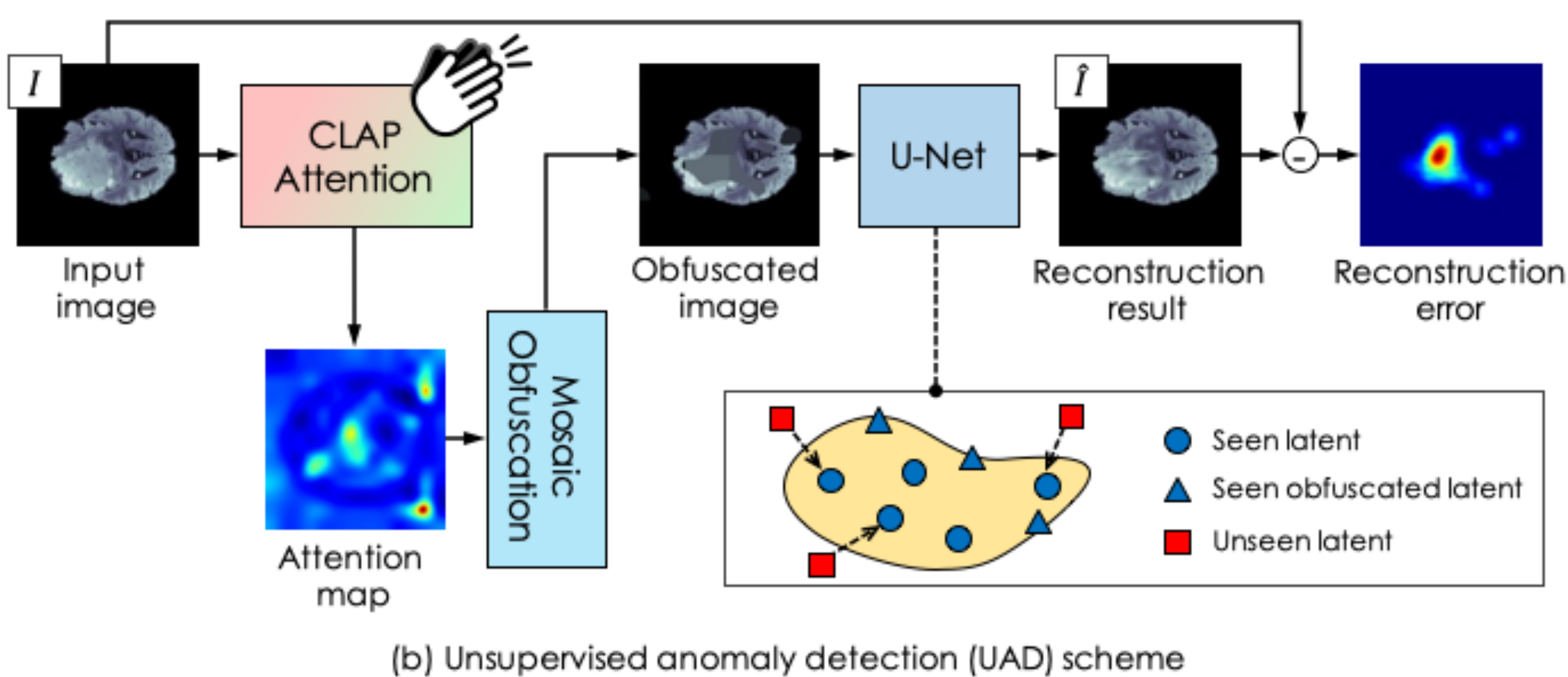
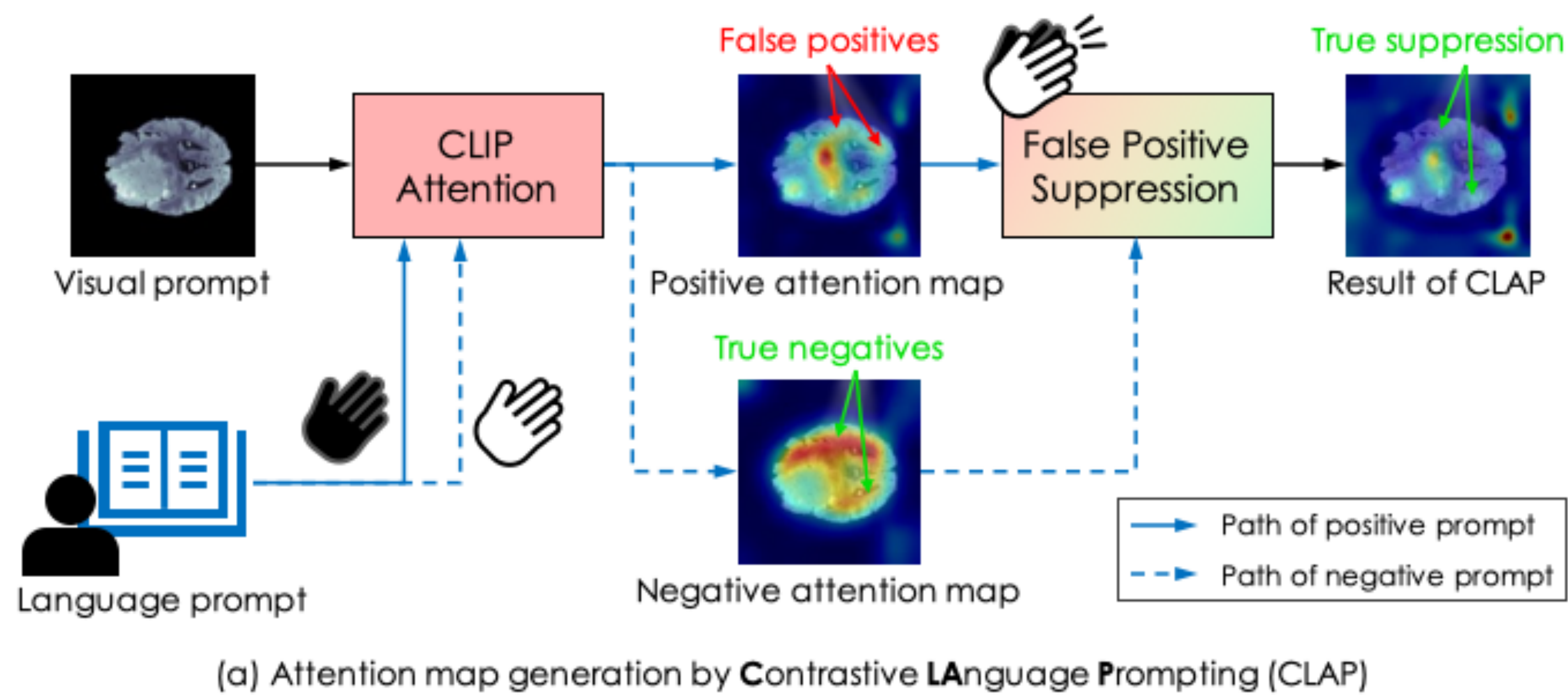
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INTRODUCTION



- False positives hinders accurate detection of disease regions.
- CLAP refines attention by leveraging both positive and negative text prompts.

METHODS



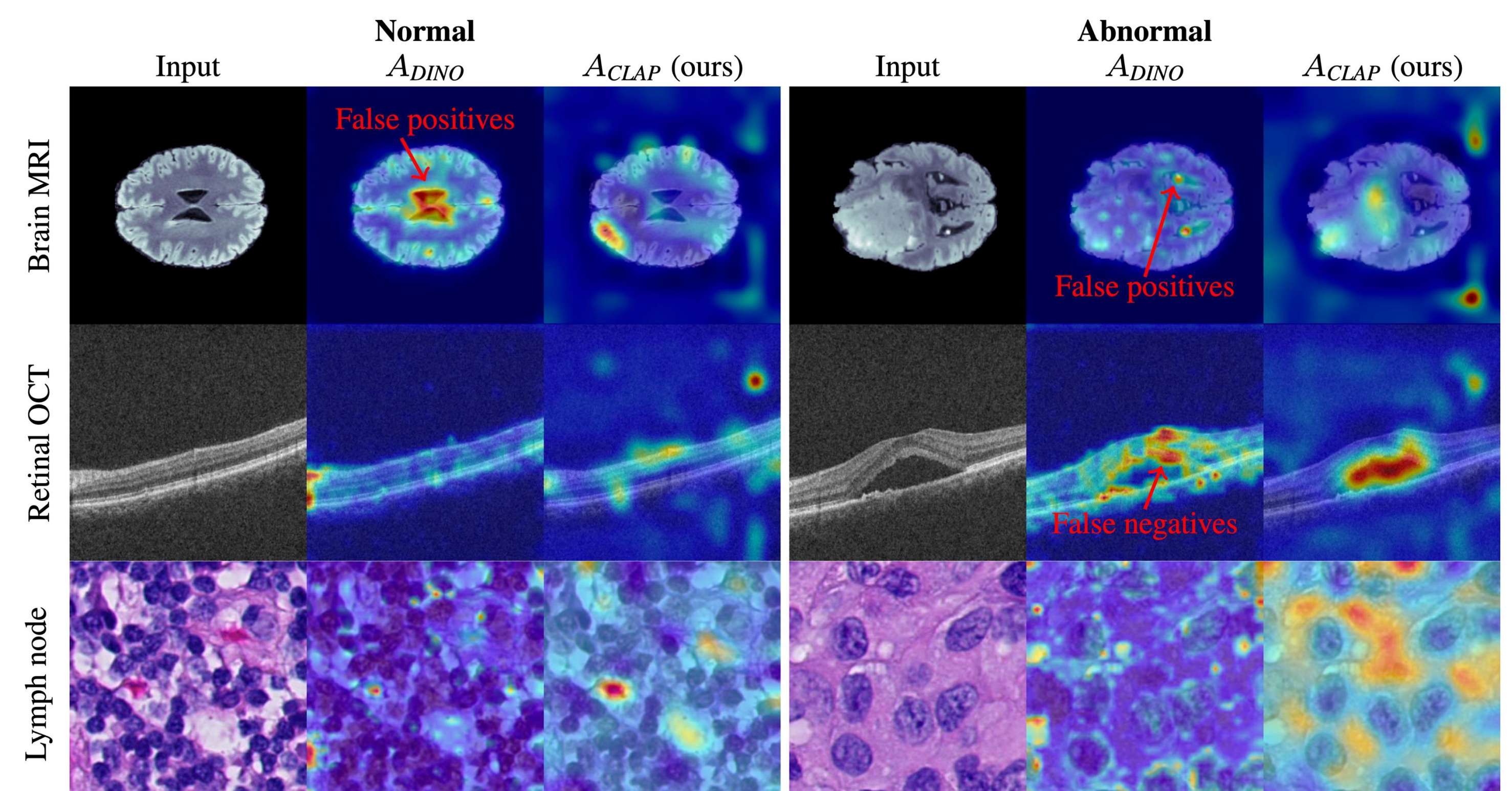
Anatomy	P/N	Language prompt
Brain MRI	P	Glioma, Astrocytoma, Oligodendroglioma ...
	N	Normal, Healthy gray matter ...
Liver CT	P	Malignant cells, Dysplasia, Hyperplasia ...
	N	Normal, Healthy, Benign ...
Retinal OCT	P	Retinal fluid, Drusen, Retinal detachment ...
	N	Normal, Healthy, Clear ...
Chest X-ray	P	Consolidation, Fibrosis, Atelectasis ...
	N	Healthy, Clear fields, Normal ...
Lymph node	P	Metastatic carcinoma, Tumor metastasis ...
	N	Normal, Healthy tissue ...

Examples of positive (P) and negative (N) language prompts

EXPERIMENTAL SETUP

- Dataset:** BMAD benchmark covering MRI, CT, X-ray, OCT, and histopathology images.
- Models:** EAR (U-Net), CLIP with positive language prompting (PLP) alone, and CLAP (ours).
- Evaluation:** Image-level AUROC scores.

RESULTS



CLAP suppresses false positives effectively

Anatomy	Brain MRI	Liver CT	Retinal OCT		Chest X-ray	Lymph node	Average
Dataset	BraTS2021	BTCV + LiTs	RESC	OCT2017	RSNA	CAMELYON16	
EAR [2]	77.37	72.51	86.42	97.46	71.69	63.39	78.21
PLP	73.54	72.76	90.08	96.77	65.23	64.98	77.23
CLAP (ours)	78.55	72.60	91.66	96.38	65.76	68.42	78.89

CLAP improves image-level disease detection

CONCLUSION

- CLAP effectively reduces false positives to find suspected disease regions.
- Outperforms existing EAR and PLP methods in medical anomaly detection.
- Future work aims to automate fine prompt generation to enhance usability.

REFERENCES

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- YeongHyeon Park, et al., "Visual defect obfuscation based self-supervised anomaly detection," *Scientific Reports*, 2024.
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