

Deep Image Decomposition for Medical Imaging Anonymization and Curation

Anonymous WACV Applications Track submission

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A. Turing-like Test

Fig. 10 presents the Turing-like test questionnaire images. The questionnaire presented pairs of Raw and Curated images in random order. Marked images, containing synthesized annotations, were not shown to participants and are included here for illustration only. Per-pair response statistics are shown on the right side of each panel.

B. Ablation Studies

U-net Layer Ablation. Table 5 reports an ablation study on the U-Net architecture design, where the number of layers in the U-Net generators was varied to control the receptive field. PSNR and SSIM values were evaluated for each configuration. The results show that increasing the number of layers improves performance, with the proposed 5,5 configuration achieving the best PSNR and SSIM.

Mask Ablation. GradCAM [35] maps often under-segment the Region of Interest (ROI). To address this limitation, we employ an ensemble of K classifiers, each producing its own GradCAM map. While the ensemble also supports classification, here we leverage it primarily to improve ROI coverage by aggregating multiple attention maps. In addition, we apply a sigmoid transformation to the aggregated XAI map M to further mitigate under-segmentation, yielding a soft mask \mathcal{M} . The parameters a and b control the slope and offset of the sigmoid (Eq. 3, main paper): a larger a sharpens the mask by assigning more pixels to 1, enhancing coverage of text regions, while $b = 5$ shifts the dynamic range to keep mask values within $[0,1]$. Fig. 3 (main paper) illustrates the raw GradCAM map, the resulting soft mask, and the masked input regions. Table 6 reports PSNR and SSIM for different settings of a and b on the public US dataset. The selected parameters, though not globally optimal, were chosen empirically as they consistently balanced preservation of image content with effective masking of annotation artifacts.

# Layers (Down,Up)	PSNR \uparrow	SSIM \uparrow
3,3	32.45	0.95
4,4	32.84	0.94
5,5 (Proposed)	35.67	0.97

Table 5. **U-Net layer ablation.** PSNR and SSIM values for different numbers of layers in the U-NET generators architectures.

K	f	a	PSNR \uparrow	SSIM \uparrow
1	–	5	30.84	0.92
1	–	15	32.68	0.94
1	–	20	32.82	0.93
1	–	25	33.15	0.94
1	–	30	31.27	0.93
5	mean	15	32.32	0.94
5	median	15	31.75	0.93
5	max	15	33.41	0.95
5	mean	25	33.29	0.94
5	median	25	34.48	0.96
5	max	25	35.67	0.97

Table 6. **Mask ablation.** Ablation study of the parameters used to convert the XAI map into the mask \mathcal{M} (Eq. 3, Fig. 3, main paper). Reported are PSNR and SSIM values for different sigmoid slopes (a), numbers of classifiers (K), and, for ensembles, aggregation functions of the XAI maps. The bias parameter b is fixed at 5.

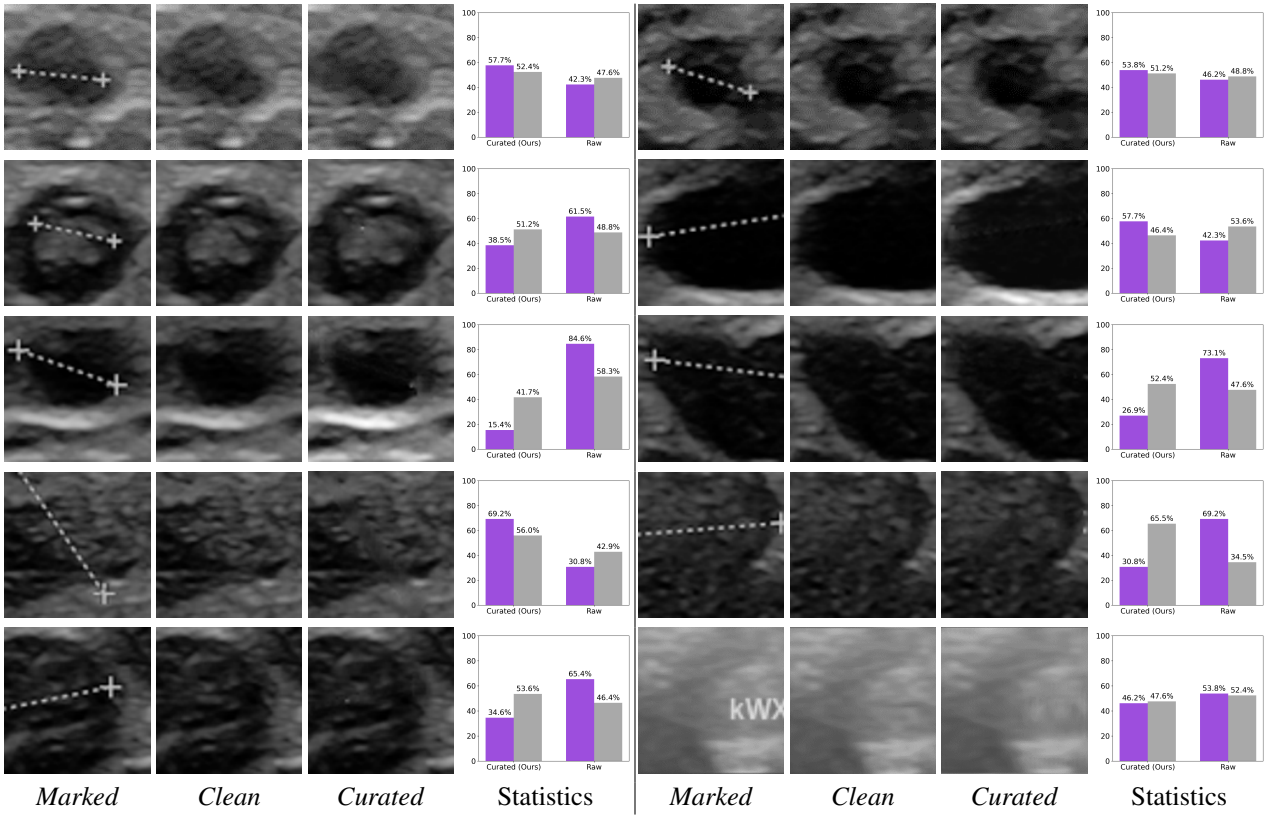


Figure 10. Images shown in our Turing-like test Questionnaire