## F ADDITIONAL VISUALIZATIONS OF SYNTHETIC DATA

Compared to optimization-based SRe2L, InfoUtil creates more realistic images by preserving details and color consistency. Compared to optimization-free methods like RDED, InfoUtil stands out with its enhanced interpretability and structured framework, emphasizing key semantic details while reducing focus on irrelevant areas. We present further visual comparisons of synthetic ImageNet-1K images generated by SRe2L, RDED, and InfoUtil at IPC = 10. Specifically, Figures 6, 7, 8 and 9 illustrate results across three representative classes, clearly highlighting the superior visual quality attained by InfoUtil. As intuitive evidence, Figure 5 shows condensed images for ImageNet-1K's *indigo bunting* category, including results from Original, Herding, SRe2L, RDED, and InfoUtil (Ours). InfoUtil focuses on the most discriminative object parts, yielding more informative results. Additional visualizations are provided in the supplements due to space constraints.


Figure 5: Visualization of condensed images for the indigo bunting category on ImageNet-1K.

(a) SRe2L

(b) RDED

(c) InfoUtil (ours)

Figure 6: We visualized synthesized images generated by SOTA methods and InfoUtil on ImageNet-1K. These images are distilled from the "Welsh Springer Spaniel" category.

(a) SRe2L

(b) RDED
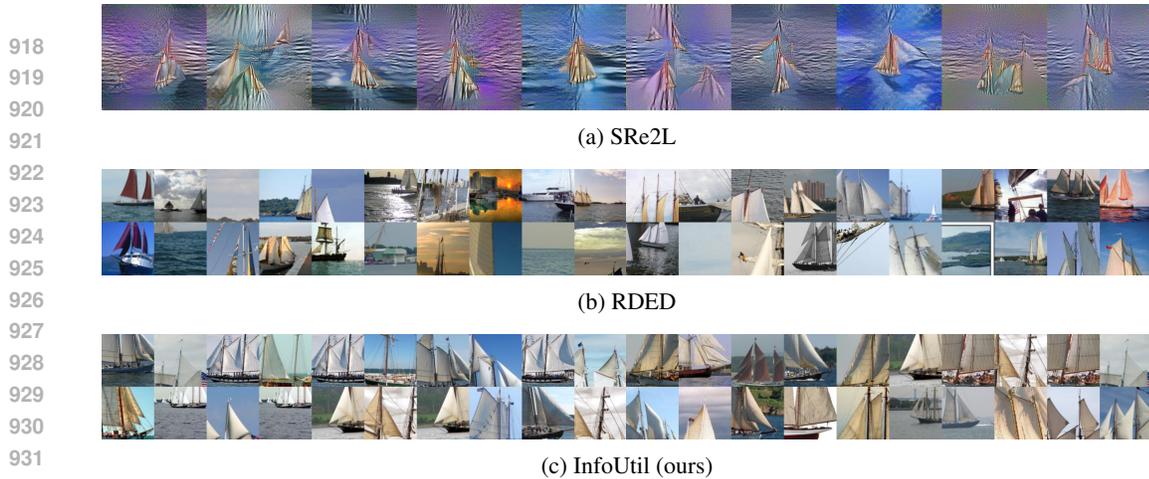
(c) InfoUtil (ours)

Figure 7: We visualized synthesized images generated by SOTA methods and InfoUtil on ImageNet-1K. These images are distilled from the "schooner" category.

(a) SRe2L

(b) RDED
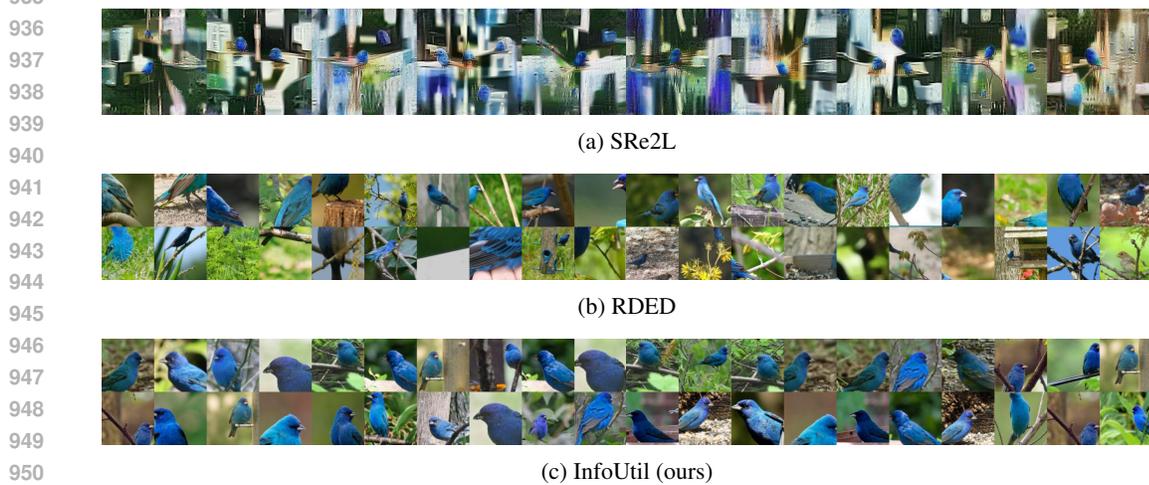
(c) InfoUtil (ours)

Figure 8: We visualized synthesized images generated by SOTA methods and InfoUtil on ImageNet-1K. These images are distilled from the "indigo bunting" category.

(a) SRe2L

(b) RDED
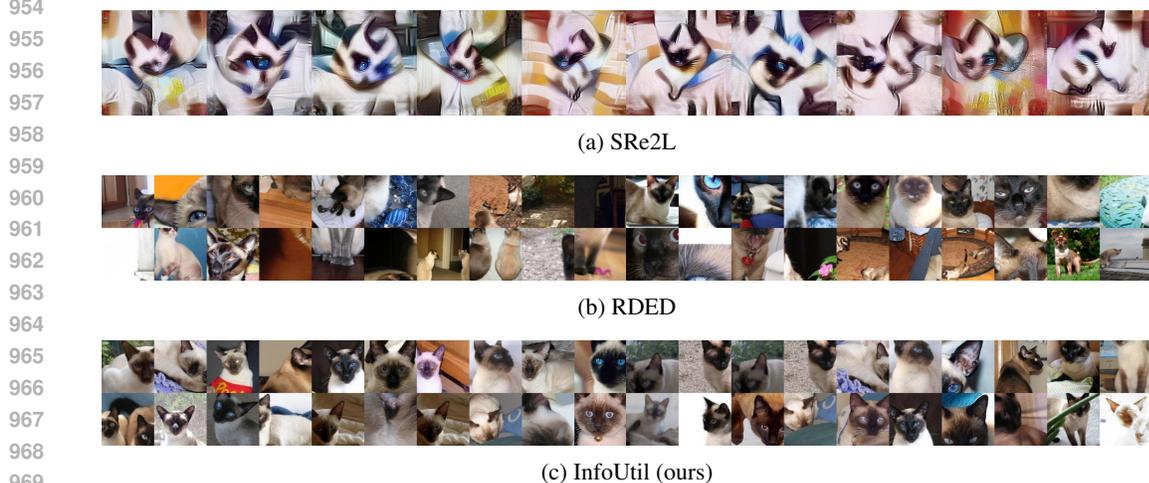
(c) InfoUtil (ours)

Figure 9: We visualized synthesized images generated by SOTA methods and InfoUtil on ImageNet-1K. These images are distilled from the "Siamese cat" category.