6. Appendix

In this appendix, we first provide more results of integrating BSR with DIM, TIM, Admix and PAM, the adversaries are crafted on three other models *i.e*. Inc-v4, IncRes-v2 and Res-101. Then we provide more comparison on the heatmap of various images using different methods.

6.1. More Evaluations on Combined Input Transformation

We provide the attack results of adversarial examples generated by integrating BSR with DIM, TIM, *Admix*, and PAM on the other three models, namely Inc-v4, IncRes-v2 and Res-101. As shown in Tab. 5-7, BSR can remarkably boost the transferability of various input transformation based attacks when generating the adversarial examples on the three models. Zhang et al. [55] have demonstrated that the combination of PAM-TI-DIM achieves state-of-the-art transferability. However, its performance on adversarially trained models remains relatively weak. Our proposed BSR-SI-DI-TIM consistently outperforms PAM-TI-DIM with a margin of at least 6.4%. Such excellent performance improvement further validates the high teffectiveness of the proposed BSR for boosting the adversarial transferability.

6.2. Visualization on Attention Heatmaps

To further support our motivation, we visualize more attention heatmaps of sampled benign images on both source model Inc-v4 and target model Inc-v3 in Fig. 5. We can observe that the attention heatmaps of adversarial examples crafted by BSR on source model are more similar with heatmap on target model than the results of other attacks. These results validate our motivation that our proposed method can eliminate the variance of attention heatmaps among various models, which is of benefit to generate more transferable adversarial examples.

Attack	Inc-v3	IncRes-v2	Res-101	Inc-v3$_{ens3}$	Inc-v3$_{ens4}$	IncRes-v2$_{ens}$
BSR-DIM	96.8$_{\uparrow 24.8}$	94.1$_{\uparrow 30.3}$	87.8$_{\uparrow 30.4}$	59.7$_{\uparrow 37.1}$	53.6$_{\uparrow 32.5}$	37.6$_{\uparrow 11.7}$
BSR-TIM	93.8$_{\uparrow 34.7}$	91.7$_{\uparrow 42.7}$	84.6$_{\uparrow 42.7}$	69.4$_{\uparrow 42.6}$	63.4$_{\uparrow 40.5}$	51.1$_{\uparrow 34.5}$
BSR-SIM	99.0$_{\uparrow 18.6}$	97.9$_{\uparrow 24.5}$	95.2$_{\uparrow 25.8}$	86.7$_{\uparrow 38.1}$	85.2$_{\uparrow 40.0}$	70.2$_{\uparrow 40.6}$
BSR-*Admix*	99.1$_{\uparrow 10.1}$	98.5$_{\uparrow 13.2}$	97.0$_{\uparrow 18.0}$	88.0$_{\uparrow 32.5}$	86.0$_{\uparrow 34.3}$	74.0$_{\uparrow 41.7}$
BSR-PAM	99.2$_{\uparrow 12.5}$	98.2$_{\uparrow 16.6}$	96.2$_{\uparrow 20.3}$	87.2$_{\uparrow 31.8}$	81.4$_{\uparrow 30.9}$	62.8$_{\uparrow 29.6}$
Admix-TI-DIM	91.0	88.6	83.2	76.0	74.7	64.3
PAM-TI-DIM	91.5	88.5	83.5	77.1	73.2	62.1
BSR-TI-DIM	91.2	88.5	83.5	77.1	73.2	62.1
BSR-SI-TI-DIM	**98.1**	**96.2**	**94.7**	**90.1**	**89.0**	**80.0**

Table 5. Attack success rates (%) on seven models under single model setting with various input transformations combined with BSR. The adversaries are crafted on Inc-v4. ↑ indicates the increase of attack success rate when combined with BSR.

Attack	Inc-v3	Inc-v4	Res-101	Inc-v3$_{ens3}$	Inc-v3$_{ens4}$	IncRes-v2$_{ens}$
BSR-DIM	95.1$_{\uparrow 24.8}$	95.0$_{\uparrow 30.3}$	91.5$_{\uparrow 33.5}$	71.7$_{\uparrow 41.3}$	65.4$_{\uparrow 41.9}$	54.8$_{\uparrow 37.9}$
BSR-TIM	93.4$_{\uparrow 31.2}$	93.2$_{\uparrow 37.6}$	89.1$_{\uparrow 38.8}$	80.3$_{\uparrow 47.9}$	75.9$_{\uparrow 48.4}$	70.0$_{\uparrow 47.4}$
BSR-SIM	98.5$_{\uparrow 12.6}$	98.4$_{\uparrow 18.4}$	97.4$_{\uparrow 21.3}$	92.5$_{\uparrow 36.3}$	89.5$_{\uparrow 40.4}$	81.9$_{\uparrow 39.4}$
BSR-*Admix*	99.1$_{\uparrow 8.3}$	99.3$_{\uparrow 13.0}$	98.1$_{\uparrow 15.9}$	93.7$_{\uparrow 30.1}$	92.1$_{\uparrow 35.5}$	87.3$_{\uparrow 37.9}$
BSR-PAM	99.3$_{\uparrow 10.7}$	99.2$_{\uparrow 12.9}$	98.5$_{\uparrow 16.9}$	94.2$_{\uparrow 28.2}$	91.2$_{\uparrow 32.9}$	83.3$_{\uparrow 32.3}$
Admix-TI-DIM	90.9	89.5	86.5	81.7	77.7	76.4
PAM-TI-DIM	92.2	90.5	86.9	84.2	80.9	78.4
BSR-TI-DIM	94.5	93.6	90.6	81.0	77.5	72.9
BSR-SI-TI-DIM	**98.6**	**98.1**	**96.3**	**95.4**	**94.0**	**91.7**

Table 6. Attack success rates (%) on seven models under single model setting with various input transformations combined with BSR. The adversaries are crafted on IncRes-v2. ↑ indicates the increase of attack success rate when combined with BSR.

Attack	Inc-v3	Inc-v4	IncRes-v2	Inc-v3$_{ens3}$	Inc-v3$_{ens4}$	IncRes-v2$_{ens}$
BSR-DIM	97.7$_{\uparrow 21.7}$	96.6$_{\uparrow 28.2}$	97.1$_{\uparrow 26.8}$	82.7$_{\uparrow 48.0}$	75.8$_{\uparrow 44.0}$	59.7$_{\uparrow 40.1}$
BSR-TIM	96.7$_{\uparrow 36.8}$	95.6$_{\uparrow 43.4}$	94.9$_{\uparrow 43.0}$	86.6$_{\uparrow 52.2}$	83.4$_{\uparrow 52.2}$	75.3$_{\uparrow 51.6}$
BSR-SIM	98.8 $_{\uparrow 20.3}$	98.3$_{\uparrow 25.8}$	98.1$_{\uparrow 26.9}$	91.5$_{\uparrow 46.7}$	89.1$_{\uparrow 49.0}$	75.8$_{\uparrow 48.5}$
BSR-*Admix*	99.6$_{\uparrow 15.1}$	99.2$_{\uparrow 19.0}$	99.4$_{\uparrow 18.7}$	94.2$_{\uparrow 42.6}$	92.5$_{\uparrow 47.8}$	82.4$_{\uparrow 52.5}$
BSR-PAM	98.7$_{\uparrow 21.3}$	97.2$_{\uparrow 23.3}$	97.7$_{\uparrow 22.0}$	90.0$_{\uparrow 38.8}$	86.8$_{\uparrow 40.3}$	70.3$_{\uparrow 38.1}$
Admix-TI-DIM	89.5	85.6	87.5	80.4	75.2	67.5
PAM-TI-DIM	85.8	83.2	84.9	81.1	76.1	66.9
BSR-TI-DIM	97.3	95.1	95.6	88.3	85.4	76.1
BSR-SI-TI-DIM	**97.4**	**97.0**	**96.6**	**94.8**	**93.2**	**89.1**

Table 7. Attack success rates (%) on seven models under single model setting with various input transformations combined with BSR. The adversaries are crafted on Res-101. ↑ indicates the increase of attack success rate when combined with BSR.

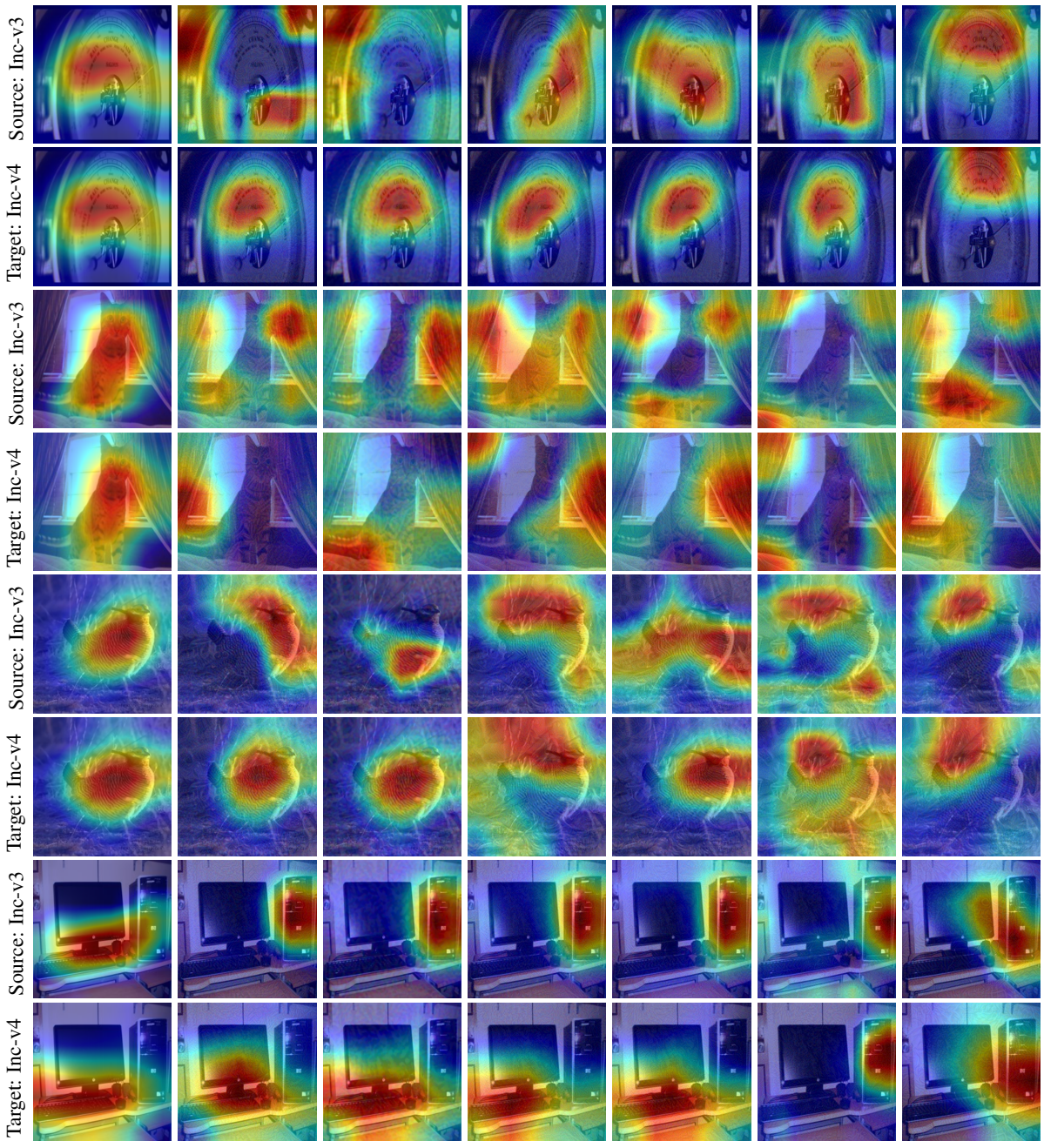

Figure 5. The visualization of attention heatmaps [28] of adversaries crafted by various input transformation methods on source model Inc-v3 [36], and target model Inc-v4 [35]