NTIRE 2025 Image Super-Resolution (×4) Challenge Factsheet-Team 25

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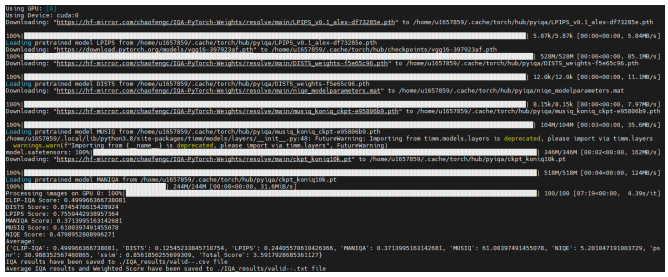

Figure 1. Perceptual Metrics. (Valid)

1	calyx	1	03/19/25	32.3508 (1)	0.87 (4)	-1.00 (1)	-1.00 (3)	-1.00 (1)
2	flyfly	2	03/21/25	31.9289 (2)	0.87 (3)	-1.00 (1)	-1.00 (3)	-1.00 (1)
3	UltraSR	2	03/22/25	31.8802 (3)	0.87 (2)	-1.00 (1)	-1.00 (3)	-1.00 (1)
4	eegt	2	03/22/25	31.7872 (4)	0.87 (5)	82.42 (8)	-1.00 (3)	-1.00 (1)
5	YYYabcd	1	03/21/25	31.7455 (5)	0.87 (6)	-1.00 (1)	-1.00 (3)	-1.00 (1)
6	junle_liu	2	03/21/25	31.7318 (6)	0.87 (7)	-1.00 (1)	-1.00 (3)	-1.00 (1)
7	yhy_gogo	3	03/20/25	31.7179 (7)	0.87 (9)	-1.00 (1)	-1.00 (3)	-1.00 (1)
8	Jasmine_o1	3	03/21/25	31.6810 (8)	0.87 (8)	-1.00 (1)	-1.00 (3)	-1.00 (1)
9	Champion	3	03/21/25	31.6639 (9)	0.87 (10)	-1.00 (1)	-1.00 (3)	-1.00 (1)
10	SR_F	3	03/20/25	31.4971 (10)	0.87 (12)	-1.00 (1)	-1.00 (3)	-1.00 (1)
11	SISR	3	03/20/25	31.4700 (11)	0.87 (13)	-1.00 (1)	-1.00 (3)	-1.00 (1)
12	ZDBBB1024	3	03/20/25	31.4537 (12)	0.87 (14)	-1.00 (1)	-1.00 (3)	-1.00 (1)
13	Q_y	3	03/19/25	31.4032 (13)	0.87 (15)	-1.00 (1)	-1.00 (3)	-1.00 (1)
14	xiaozhazha	1	03/21/25	31.2389 (14)	0.86 (16)	10.43 (6)	1.00 (1)	1.00 (3)
15	siyuan_wang_1	3	03/16/25	31.2212 (15)	0.86 (19)	-1.00 (1)	-1.00 (3)	-1.00 (1)
16	OBS_t	3	03/15/25	31.2164 (16)	0.86 (20)	-1.00 (1)	-1.00 (3)	-1.00 (1)
17	hhhfccz	3	03/22/25	31.1771 (17)	0.86 (24)	-1.00 (1)	0.00 (2)	0.00 (2)
18	ming0531	1	03/18/25	31.1766 (18)	0.86 (22)	-1.00 (1)	-1.00 (3)	-1.00 (1)

Figure 2. Restoration Metrics on leaderboard. (Test)

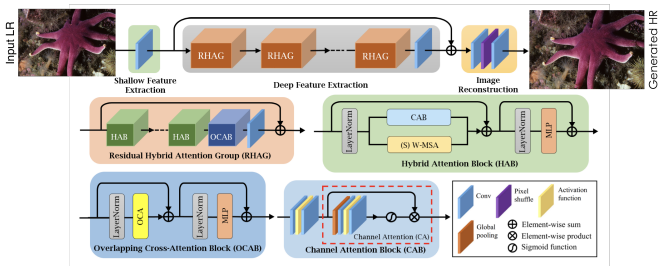

Figure 3. The model architecture of HAT [2].

1. Team details

- Team name: ACVLAB
- Team id: 25
- Team leader name: Chih-Chung Hsu
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- Rest of the team members: Chia-Ming Lee, Yu-Fan Lin
- Team website: https://cchsu.info/wordpress/
- Affiliation: Institute of Data Science, National Cheng Kung University
- User names and entries on the NTIRE 2025 Codalab competitions: ming0531
- Best scoring in testing phase: 31.1766 / 0.86 (PSNR/SSIM)
- Link to the codes/executables of the solution(s):
- Code (Github)
- Checkpoint (GoogleDrive)
- Input / Output file (GoogleDrive)

2. Method details

Our solution is based on HAT [2] and several self-ensemble fusion approach for enhancement. For training strategy, we utilized the LSDIR dataset [3] and the DIV2K dataset [1]. The training process was structured into two distinct phases.

Throughout the training process, we use the Adam optimizer with $\beta_1 = 0.9$, and $\beta_2 = 0.999$ and train for 800000 iterations in each stage. The learning rate is set to $2e-4$, the multi-step learning scheduler is also used. The learning rate is halved at the [300000, 500000, 650000, 700000, 750000] iterations respectively. After convergence, we extend training process to obtain three different model. Weight decay

is not applied. In terms of data preparation, high-resolution (HR) patches with dimensions of 256×256 pixels were extracted from the HR images. To augment the data, we applied random horizontal flips and rotations. During the first phase of training, we optimized the model using L1 loss with a batch size of 16. For the second phase, we shifted to MSE loss to further enhance the model's performance. The model was implemented using Pytorch 1.13.1 and trained on two NVIDIA-GeForce-RTX-3090s.

References

[1] Eirikur Agustsson and Radu Timofte. Ntire 2017 challenge on single image super-resolution: Dataset and study. In *2017 IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, pages 1122–1131, 2017. 1

[2] Xiangyu Chen, Xintao Wang, Jiantao Zhou, Yu Qiao, and Chao Dong. Activating more pixels in image super-resolution transformer, 2023. 1

[3] Yawei Li, Kai Zhang, Jingyun Liang, Jiezhang Cao, Ce Liu, Rui Gong, Yulun Zhang, Hao Tang, Yun Liu, Denis Demandolx, Rakesh Ranjan, Radu Timofte, and Luc Van Gool. Lsdir: A large scale dataset for image restoration. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, pages 1775–1787, 2023. 1