

NTIRE 2025 Image Super-Resolution ($\times 4$) Challenge Factsheet

-title of the contribution-

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1. Introduction

This factsheet template is meant to structure the description of the contributions made by each participating team in the NTIRE 2025 challenge on image super-resolution ($\times 4$).

Ideally, all the aspects enumerated below should be addressed. The provided information, the codes/executables, and the achieved performance on the testing data are used to decide the awardees of the NTIRE 2025 challenge.

Reproducibility is a must and needs to be checked for the final test results in order to qualify for the NTIRE awards.

The main winners will be decided based on overall performance and a number of awards will go to novel, interesting solutions and to solutions that stand up as the best in a particular subcategory the judging committee will decide. Please check the competition webpage and forums for more details.

The winners, the awardees and the top-ranking teams will be invited to co-author the NTIRE 2025 challenge report and to submit papers with their solutions to the NTIRE 2025 workshop. Detailed descriptions are much appreciated.

The factsheet, [source codes/executables](#), trained models should be sent to **all of the NTIRE 2025 challenge organizers** (Zheng Chen, Zongwei Wu, Eduard-Sebastian Zamfir, Kai Zhang, Yulun Zhang, Radu Timofte, and Xiaokang Yang) by email.

2. Email final submission guide

To: zhengchen.cse@gmail.com
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Eduard-Sebastian.Zamfir@uni-wuerzburg.de
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xkyang@sjtu.edu.cn
cc: your_team_members
Title: NTIRE 2025 Image Super-Resolution ($\times 4$) Challenge - TEAM_NAME - TEAM_ID

To get your TEAM_ID, please register at [Google Sheet](#). Please fill in your Team Name, Contact Person, and Contact Email in the first empty row from the top of the sheet. Body contents should include:

- team name
- team leader's name and email address
- rest of the team members
- user names on NTIRE 2025 CodaLab competitions
- Code, pre-trained model, and factsheet download command, e.g. `git clone ..., wget ...`
- Result download command, e.g. `wget ...`
 - Please provide different URLs in e) and f)

Factsheet must be a compiled pdf file together with a zip with .tex factsheet source files. Please provide a detailed explanation.

3. Code Submission

The code and trained models should be organized according to the [GitHub repository](#). This code repository provides the basis for comparing the various methods in the challenge. **Code scripts based on other repositories will not be accepted.** Specifically, you should follow the steps below.

- Git clone [the repository](#).
- Put your model script under the `models` folder. Name your model script as `[Your_Team_ID]_[Your_Model_Name].py`.

3. Put your pretrained model under the `model_zoo` folder. Name your model checkpoint as `[Your_Team_ID]_[Your_Model_Name].[pth or pt or ckpt]`

4. Modify `model_path` in `test_demo.py`. Modify the imported models.

5. `python test_demo.py`

Please send us the command to download your code, e.g. `git clone [Your repository link]` When submitting the code, please remove the LR and SR images in the data folder to save the bandwidth.

4. Factsheet Information

4.1. Team details

- Team name: Aimanga
- Team leader name: Zonghao Chen
- Team leader address: Hangzhou, Zhejiang Province, China
phone number: 18817558184
email: chenzonghao@k-fashionshop.com
- Rest of the team members: Yang Ji, Xi Wang
- Team website URL: <https://discord.com/servers/mira-1256955108718284800>
- Affiliation: KUNBYTE
- User names: yangyi1221
- Best scoring: 31.214
- Link to the codes: https://github.com/jiyang0315/NTIRE2025_ImageSR_x4

4.2. Method details

This model is trained based on the RealESRGAN[2]. We have done in-depth thinking in cleaning data and image degradation models to achieve higher image reconstruction effects and better generation quality.

We used nomos2k as the training set. To extract the detailed areas in the image, we designed an effective data screening process. Finally, we selected 1342 images from 2436 nomos2k data. We carefully analyzed and tuned the image degradation model. Through continuous experiments, we found very effective image degradation models and parameters. The training process takes over 100k iterations with a batch size of 16 and a fixed learning rate of $1e-4$.

To evaluate the performance of our trained model, we created a synthetic evaluation set of 125 images. The evaluation set contains 10 categories such as human, animals, animation, and AI. This can more accurately evaluate the model's capabilities for various scenes. We further conducted experiments on the real-world dataset RealSR[1], which contains 100 images captured by Canon 5D3 and Nikon D810 cameras.

We compared our model with RealESRGAN and the lat-

est work InvSR[3] in CVPR2025. We used niqe, brisque, nrqm, pi, clipiq and musiq as evaluation indicators. The evaluation results are shown in the following table, from which we can see that our model is better than these two models in most indicators.

Table 1. Performance comparison on the Synthetic testset

Models	Synthetic testset					
	niqe↓	brisque↓	nrqm↑	pi↓	clip-qa↑	musiq↑
Realesrgan_x4plus[2]	3.443	20.604	6.333	3.628	0.563	63.923
InvSR(CVPR2025)[3]	3.234	13.382	6.751	3.255	0.706	69.114
Ours	2.937	11.902	6.854	3.081	0.713	66.984

Table 2. Performance comparison on the Realworld testset

Methods	Realworld testset					
	niqe↓	brisque↓	nrqm↑	pi↓	clip-qa↑	musiq↑
Realesrgan_x4plus[2]	4.668	29.14	5.864	4.446	0.491	59.669
InvSR(CVPR2025)[3]	4.223	16.484	6.694	3.78	0.692	67.473
Ours	3.896	15.881	6.831	3.537	0.7	64.874

5. Other details

- We are preparing to submit a solution description paper to the NTIRE 2025 workshop, focusing on advancements in AI-based image and video enhancement techniques. The paper will present our novel model architectures designed to address real-world degradation challenges, alongside a comparison with existing state-of-the-art methods. We will also discuss the performance of our models on benchmark datasets, showcasing improvements in efficiency and quality. Additionally, we will explore potential applications and outline future directions for further development. This submission aims to contribute to the ongoing research and development in the field of image and video restoration.

References

- [1] Jianrui Cai, Hui Zeng, Hongwei Yong, Zisheng Cao, and Lei Zhang. Toward real-world single image super-resolution: A new benchmark and a new model. In *Proceedings of the IEEE/CVF international conference on computer vision*, pages 3086–3095, 2019. 2
- [2] Xintao Wang, Liangbin Xie, Chao Dong, and Ying Shan. Real-esrgan: Training real-world blind super-resolution with pure synthetic data. In *Proceedings of the IEEE/CVF international conference on computer vision*, pages 1905–1914, 2021. 2
- [3] Zongsheng Yue, Kang Liao, and Chen Change Loy. Arbitrary-steps image super-resolution via diffusion inversion. *arXiv preprint arXiv:2412.09013*, 2024. 2