

## Denoising: Implementation of state-of-the-art methods

### Project Method:

- Study the performance of RDUNet[1], Noise2Noise[3] and Noise2Void[2] on the BSD300 dataset. The official implementations are [n2v\_git] and [n2n\_git].
- Reproduce Figure 4,7 of Noise2Void[2].
- Apply super-resolution to N2N and N2V.
- Create a novel architecture for Deblurring applied to N2N.

### Next Step:

- Study the performance of N2N and N2V on different types of noise: Poisson
- Improve the performance of de-blurring.

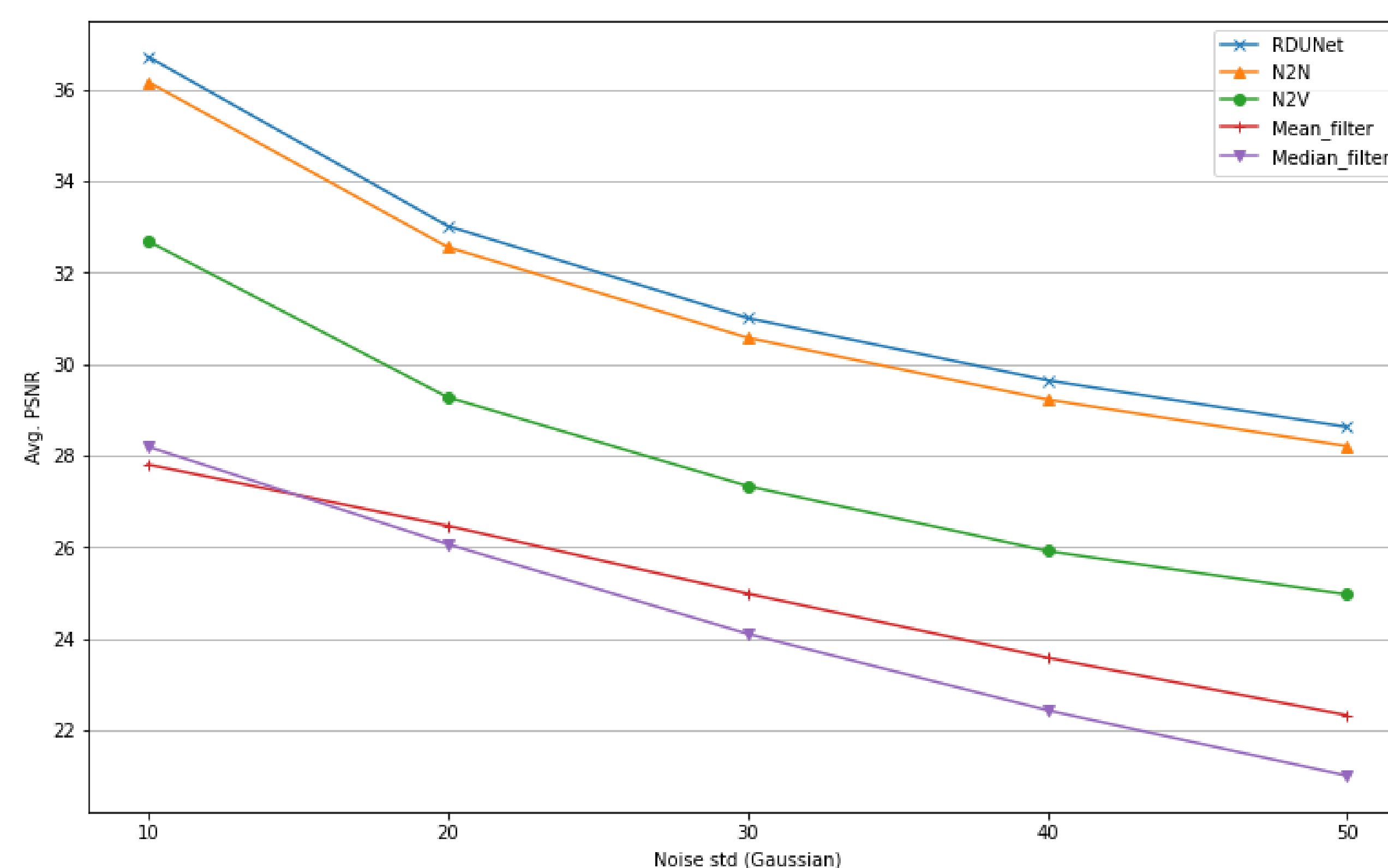


Figure 1

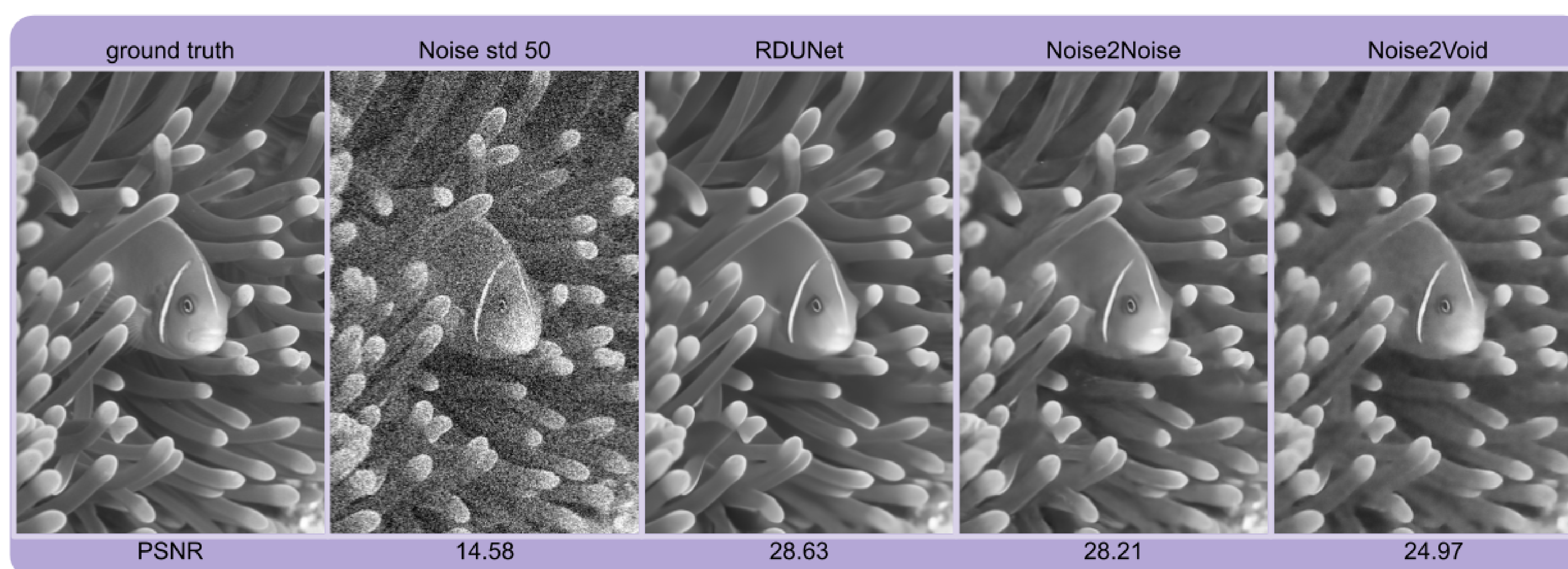


Figure 2

## Super-resolution

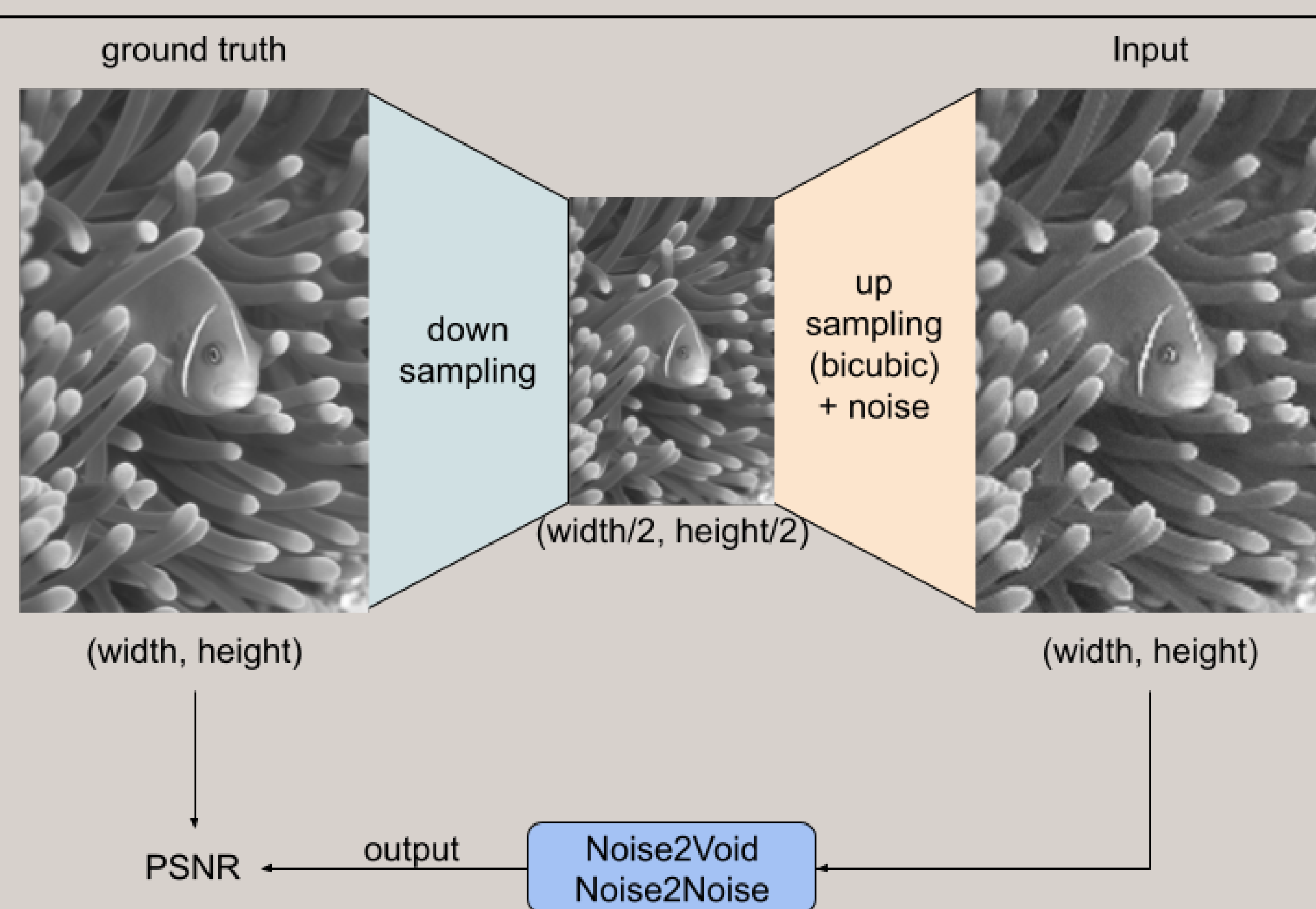
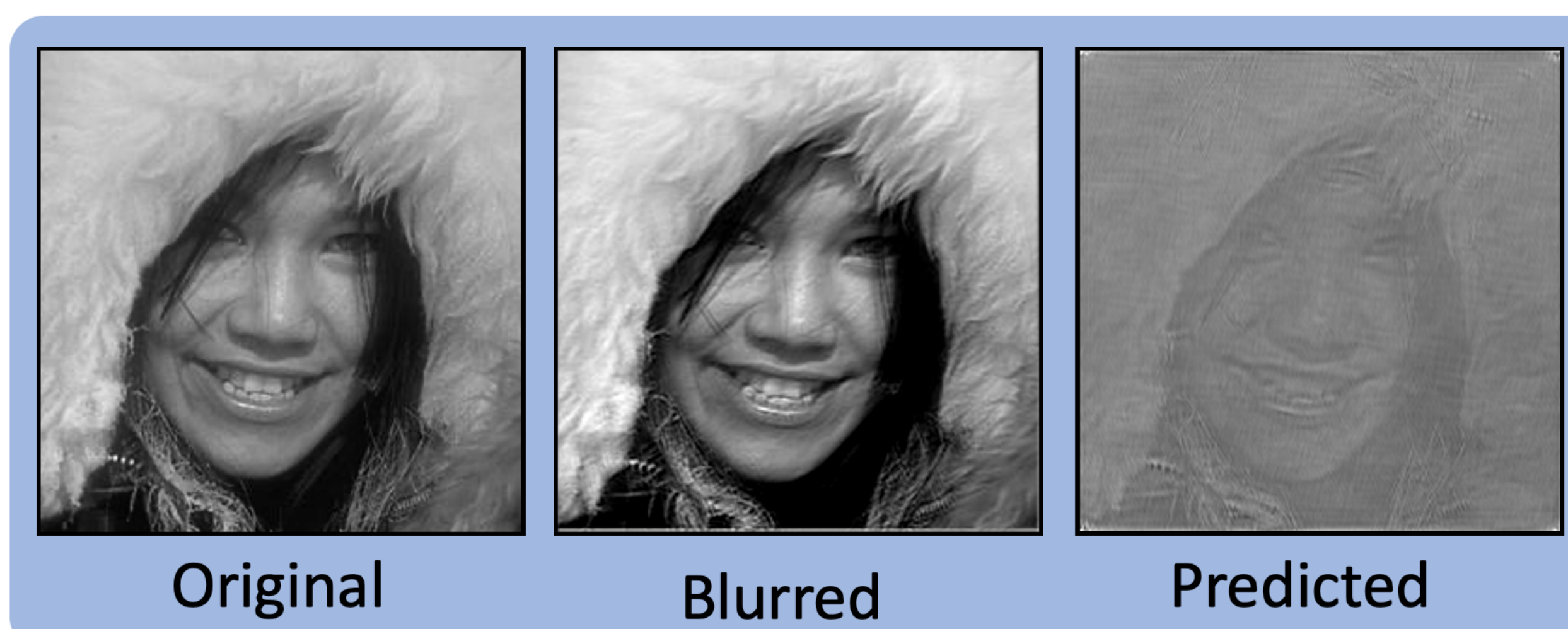
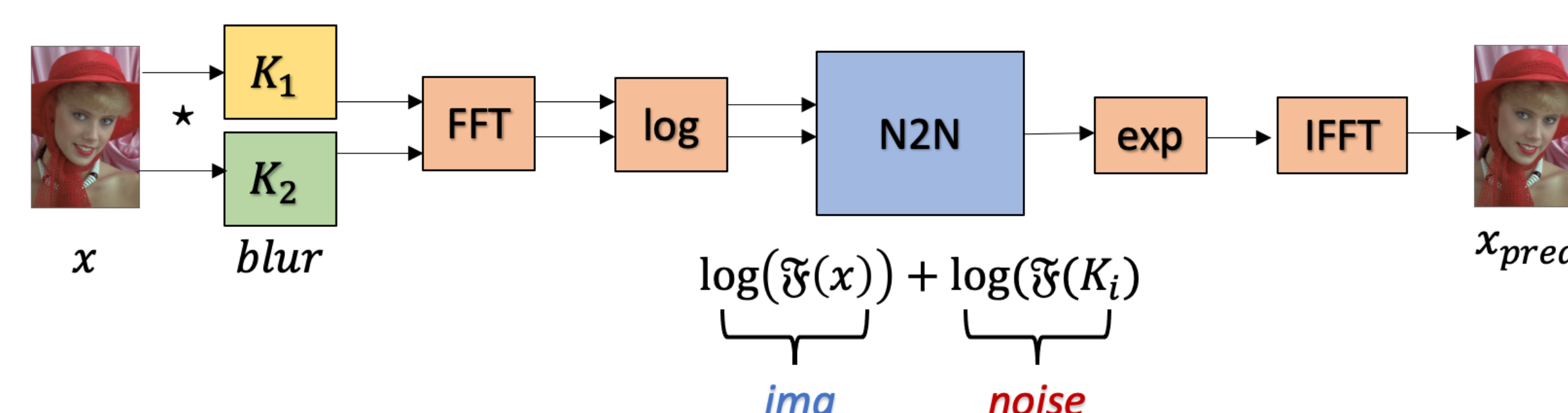


Figure 3

	N2N	N2V	Bicubic interpolation
Avg. PSNR	27.88	25.82	28.41

Table 1

## Deblurring



### References

- [1] Javier Gurrola-Ramos, Oscar Dalmau, and Teresa E. Alarcón. A residual dense u-net neural network for image denoising. *IEEE Access*, 9:31742–31754, 2021.
- [2] Alexander Krull, Tim-Oliver Buchholz, and Florian Jug. Noise2void - learning denoising from single noisy images. *CoRR*, abs/1811.10980, 2018.
- [3] Jaakko Lehtinen, Jacob Munkberg, Jon Hasselgren, Samuli Laine, Tero Karras, Miika Aittala, and Timo Aila. Noise2noise: Learning image restoration without clean data. *CoRR*, abs/1803.04189, 2018.