

I used the given test_image/juguar2/source_noise2 and tried changing different parameters to see what affects NLM.

Keep patch size $p = 7$, maximum search radius $w = 630$ (the length of the image) fixed, set the number of nearest neighbors $k = 1, 4, 6$

$K = 1$:



$K = 4$:



$K = 6$:



We can see that when $k=4$ the algorithm produces a much better image than when $k=1$. Set $k=6$, the de-noised image looks even better.

As a result, a larger number of nearest neighbors has a better effect on de-noising images.

Keep patch size $p = 7$, the number of nearest neighbors $k = 4$ fixed, set maximum search radius $w = 50, 300, 630$

$W = 50$:



$W = 300$:



$W = 630$:



When w increases, the result image changes slightly.

My explanation is that the search radius 50 is enough in searching a nice candidate for each patch, so the increase in the maximum radius does not have a significant effect.

Keep the number of nearest neighbors $k = 4$, maximum search radius $w = 630$ fixed, set patch size $p = 3, 5, 7$

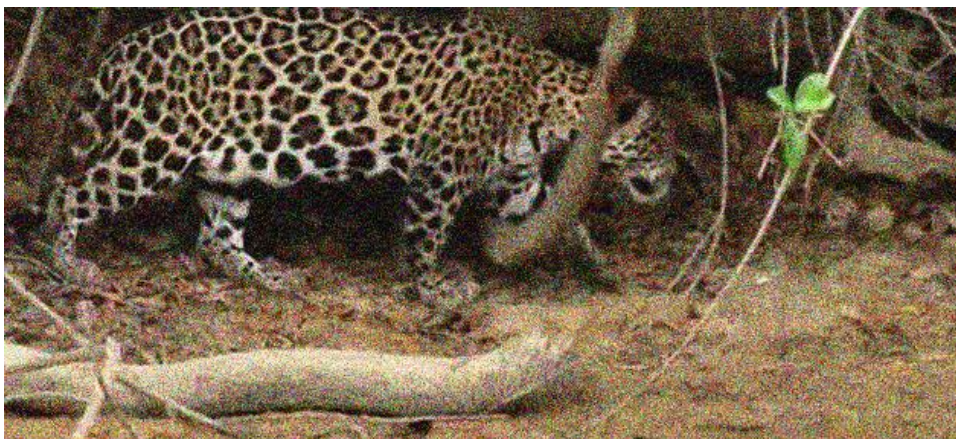
P = 3:



P = 5:



P = 7:



We can see that the choice of different patch sizes may cause changes in the shape and distribution of the noise.

I also captured some photos by my phone and tried them on the NLM algorithm.

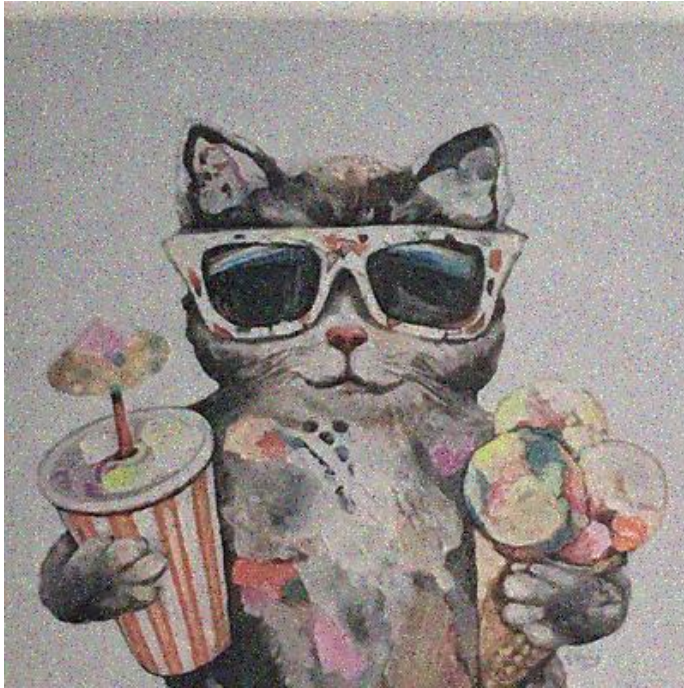
Source image 1:



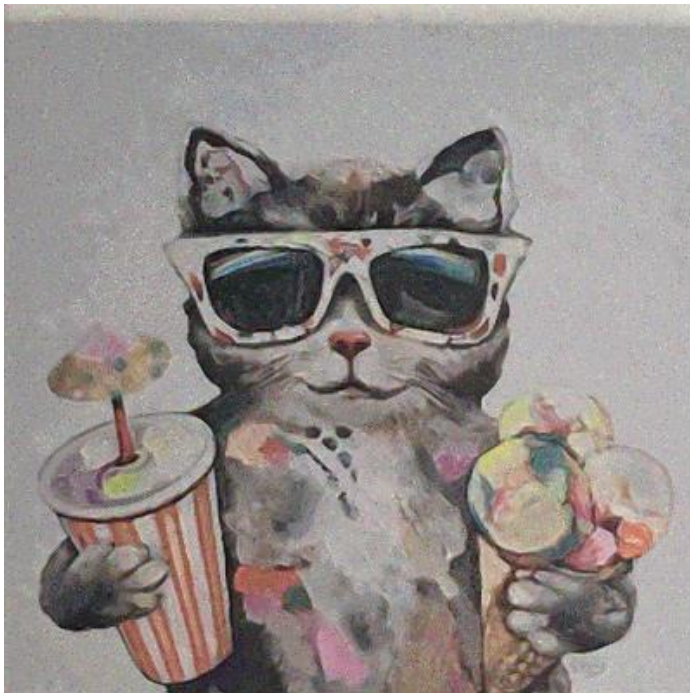
Result 1:



Source image 2:



Result 2:



The NLM algorithm produced good denoised images.

Generalized PatchMatch with $k = 3$:

Nnf_order0:



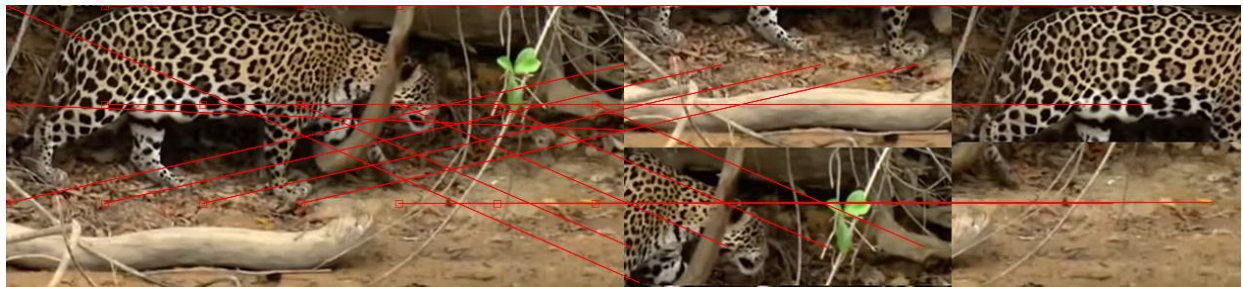
Nnf_order1:



Nnf_order2:



Nnf_vec_order0:



Rec-src_order0:



Rec-src_order1:



Rec-src_order2:

