Aplicações de fotografia computacional

Fotografia Computacional - Lux.AI

INSTITUIÇÃO EXECUTORA

Centro de Informática UFPE

FADE UFPE

COORDENADORA

MCTI FUTURO

Softex

APOIO

MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E INOVAÇÃO

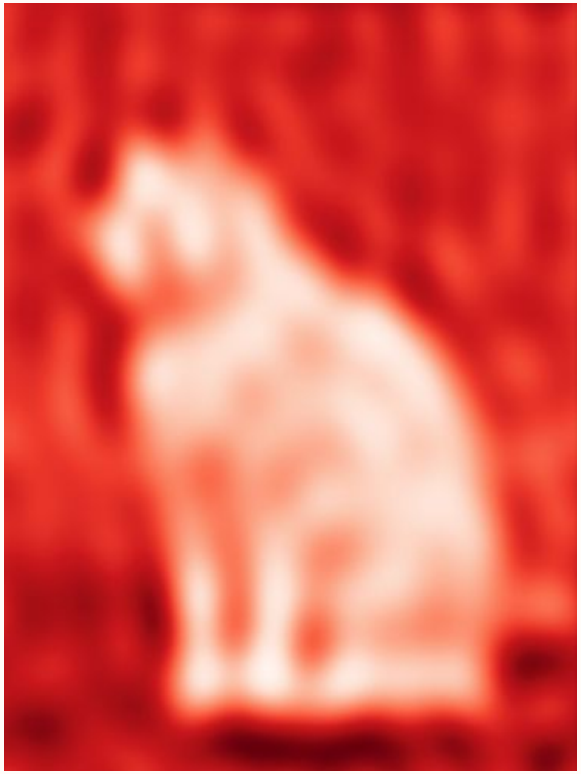
GOVERNO FEDERAL BRASIL UNIÃO E RECONSTRUÇÃO

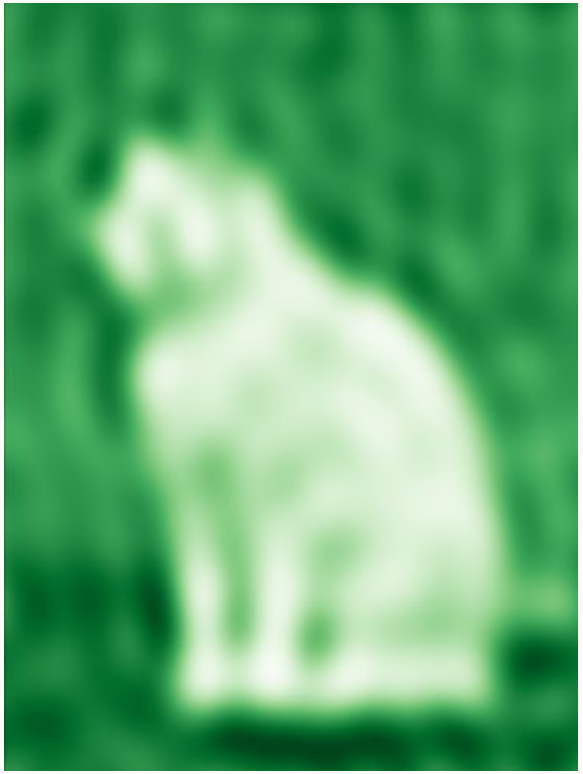
Background Blur

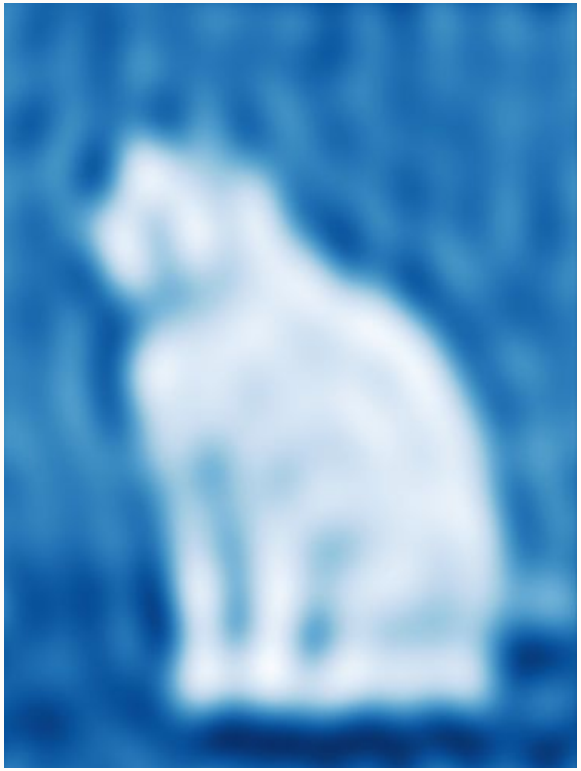
Imagem base

Separar canais

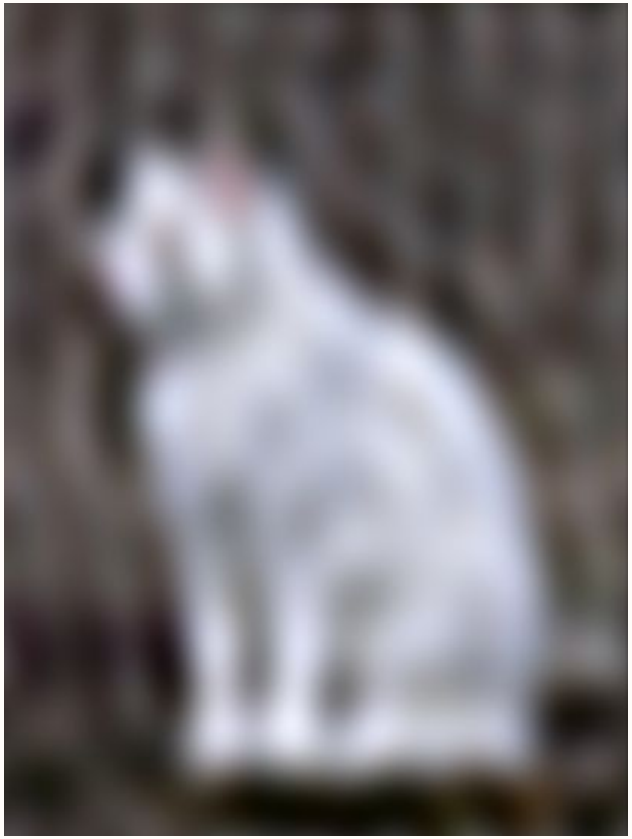
Borrar cada canal







Borrar toda a imagem

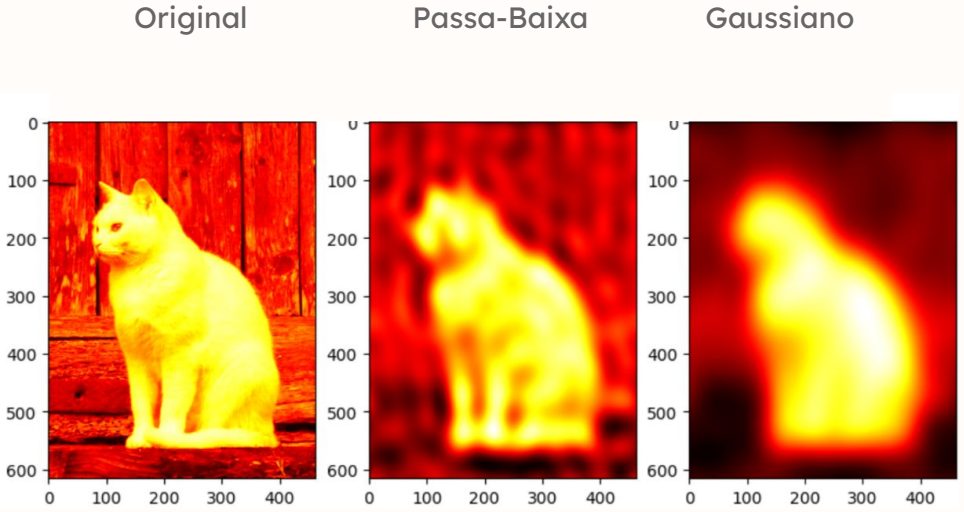


Remover o fundo

Diferentes métodos para borrar

Como mencionado anteriormente, diferentes formas de borrar podem gerar diferentes efeitos.

Nas imagens ao lado podemos ver o resultado de alguns filtros no canal red.



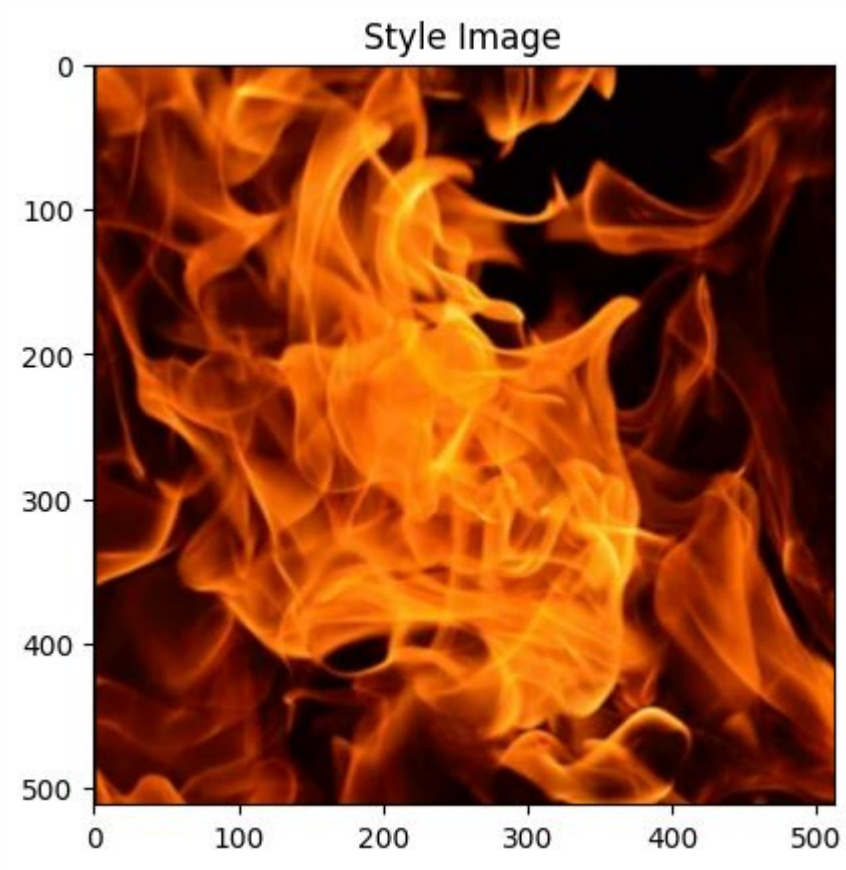
Gaussiana para remover ondulações do passa-baixa

Transferência de Estilo Neural

Conceitos gerais

- **Entradas**
- **Extração de Características**
- **Função de Perda**
- **Otimização**
- **Resultado**

Entradas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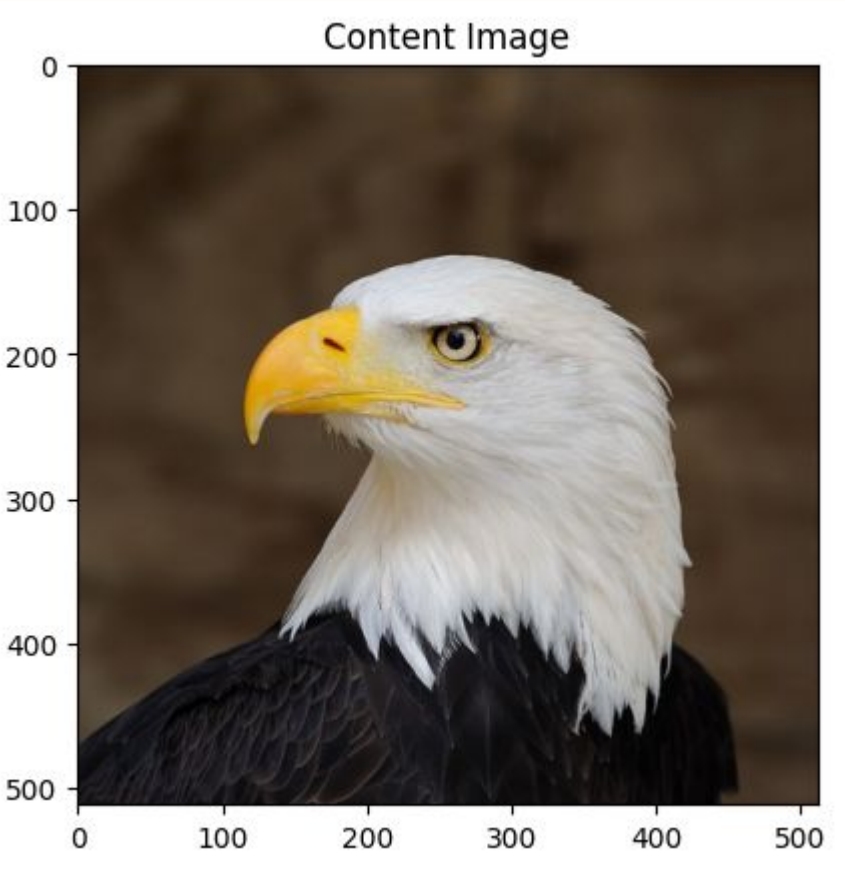
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Extração de característica

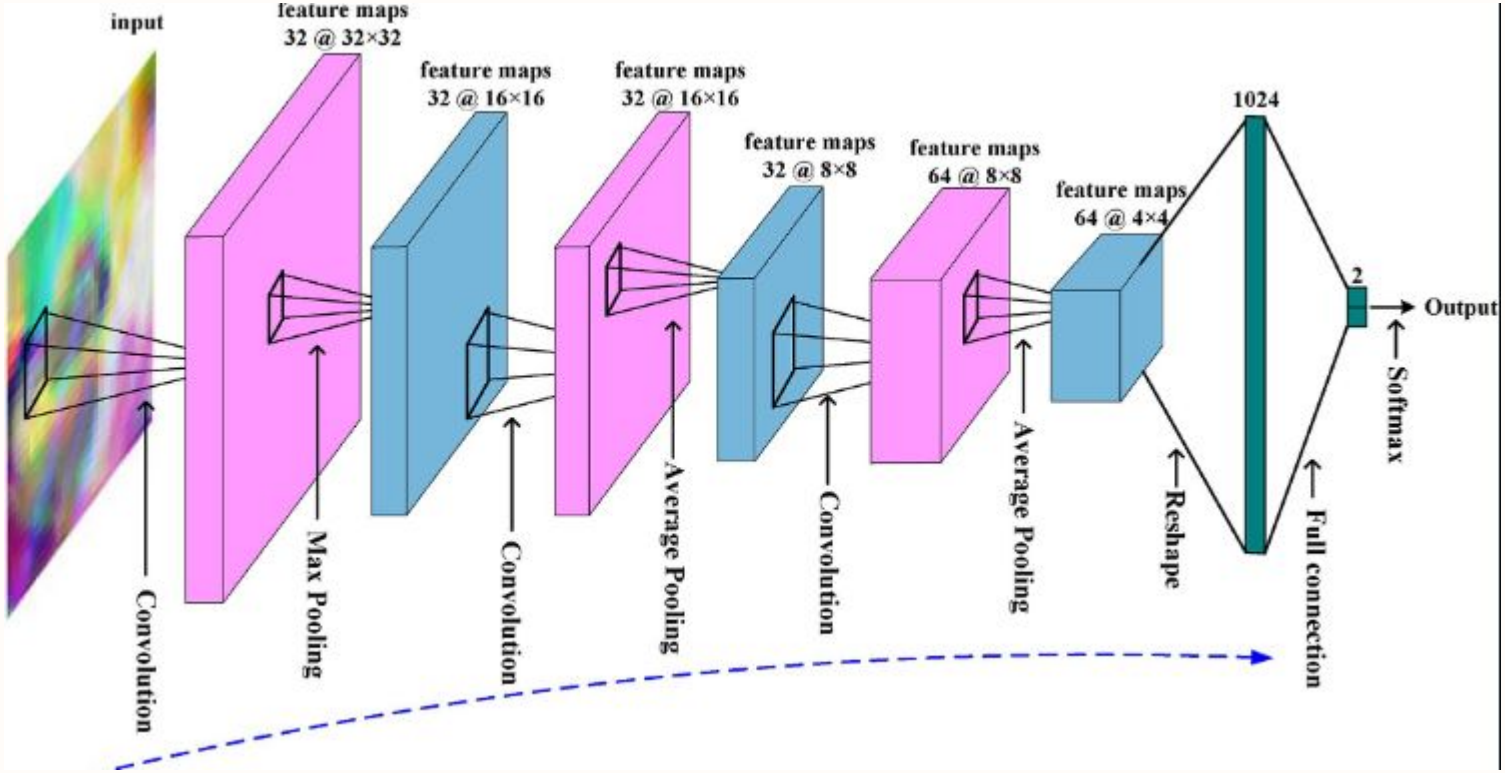
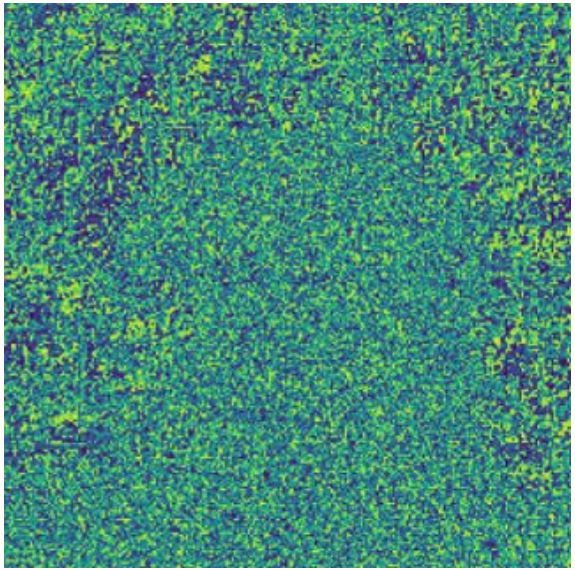
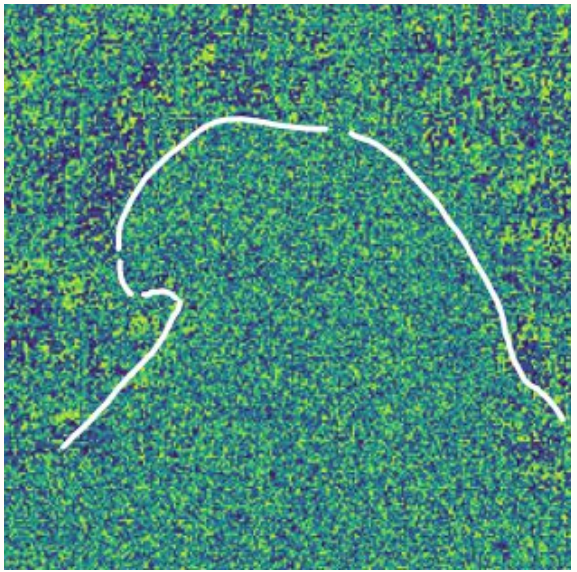


Imagem do artigo

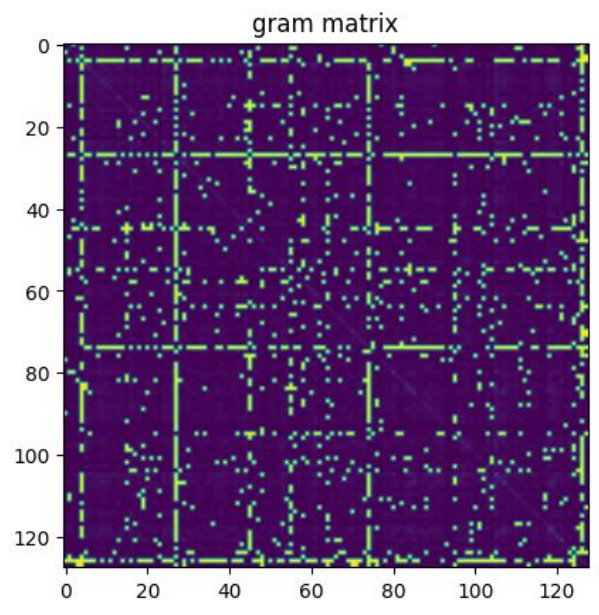
Conteúdo

Resultado após a 4° camada de convolução





Estilo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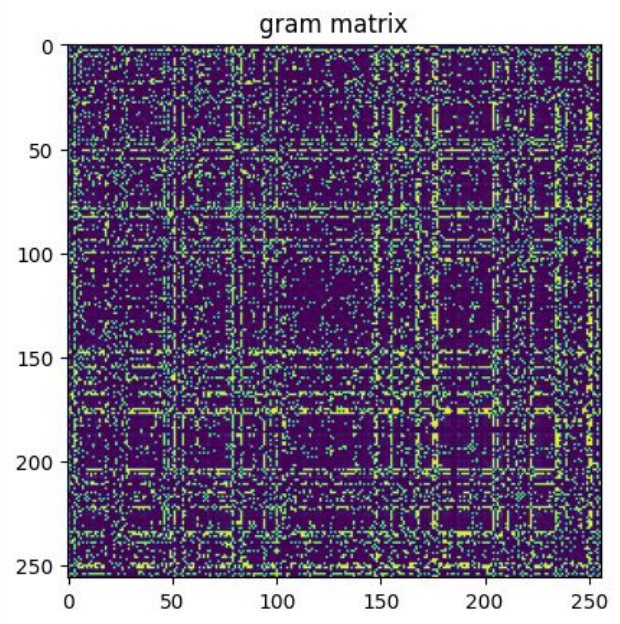
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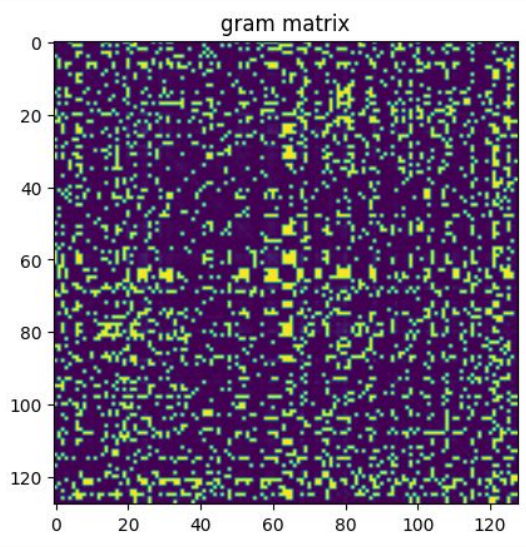
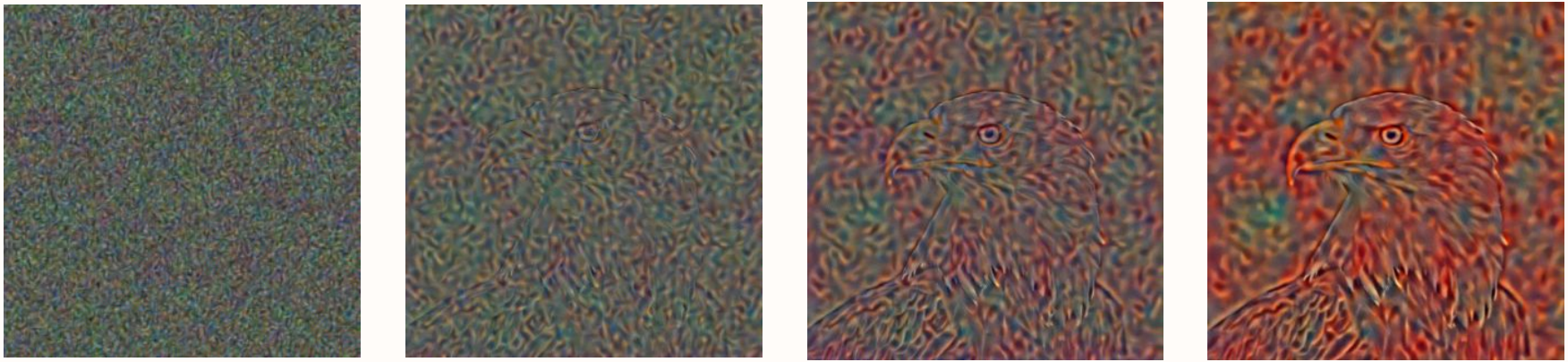
200
250


gram matrix
0
20
40
60
80
100
120
0
20
40
60
80
100
120

Função de Perda

$$L = \alpha L_{conteudo} + \beta L_{estilo}$$

Otimização



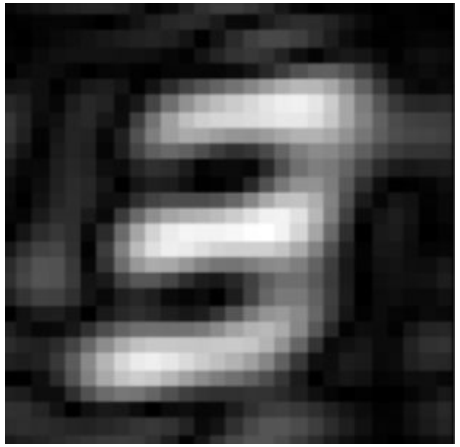
Otimização

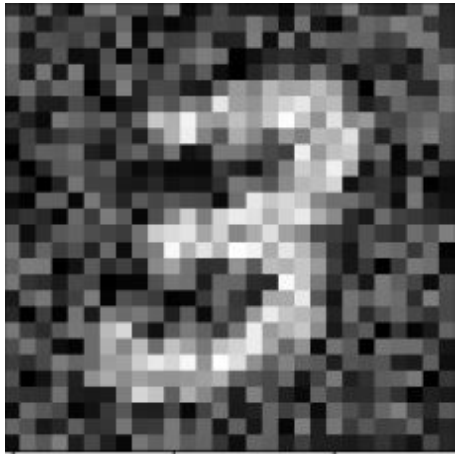



referencias

Gatys, Leon A., Alexander S. Ecker, and Matthias Bethge. "A neural algorithm of artistic style." *arXiv preprint arXiv:1508.06576* (2015).

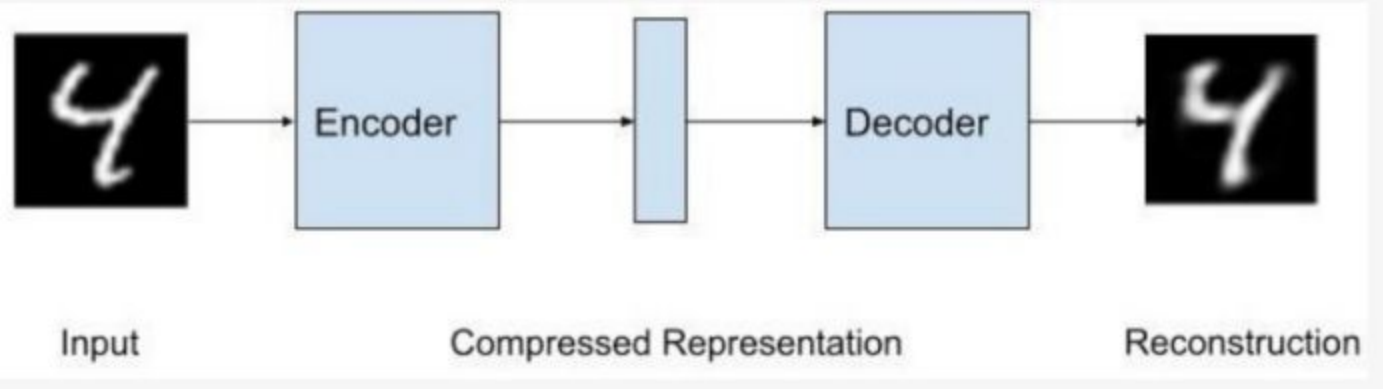
Image Deblurring and Image denoising



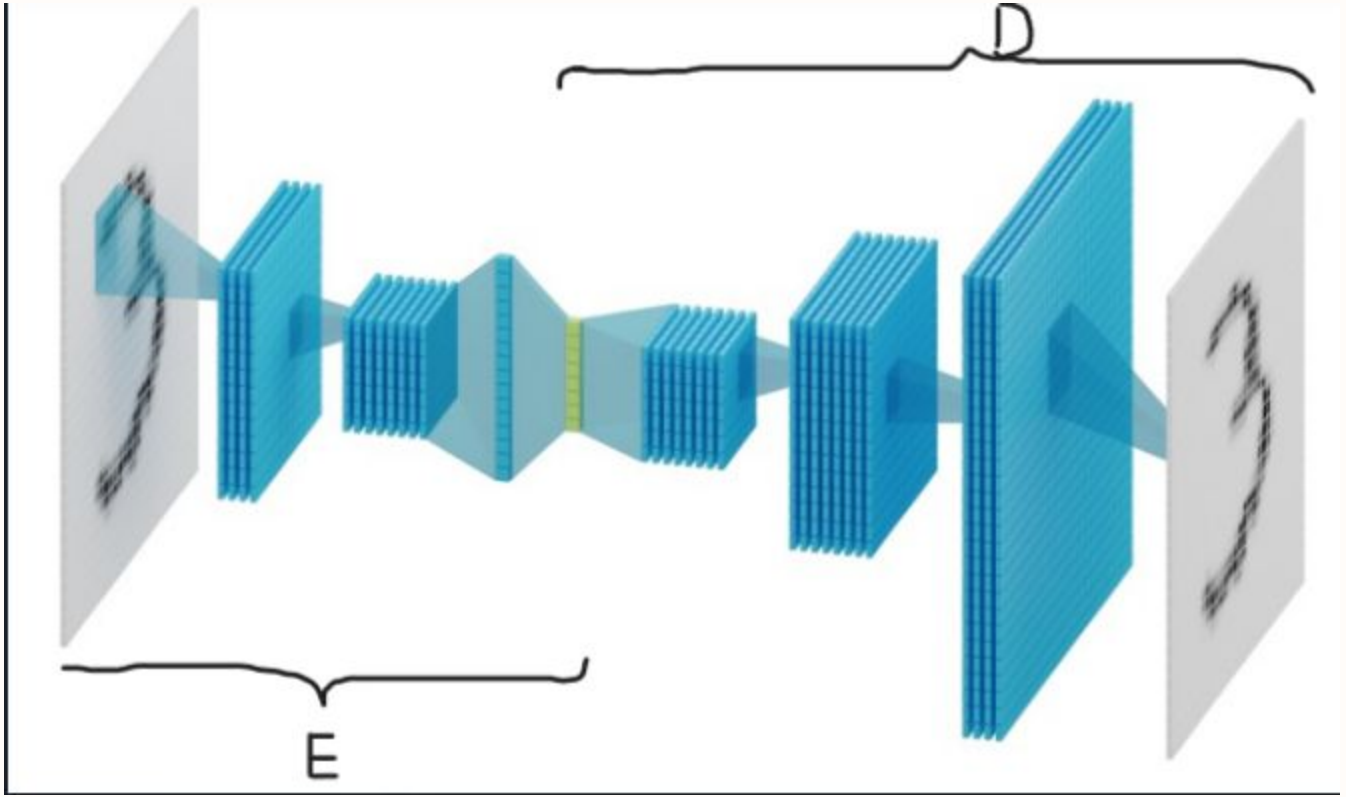


Autoencoders

$$E : X \longrightarrow Cod$$
$$D : Cod \longrightarrow X$$
$$D(E(x)) = x$$



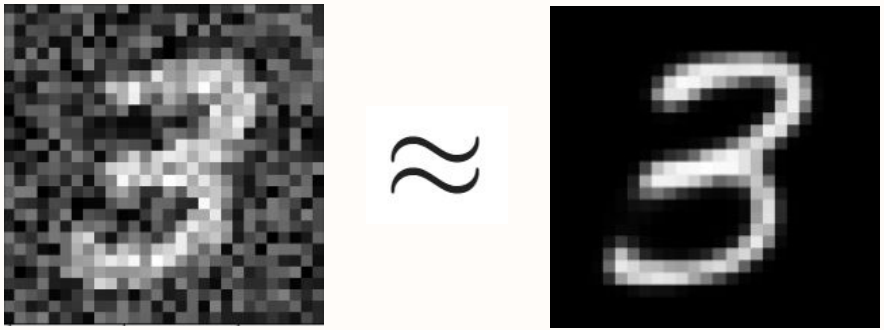
https://www.mdpi.com/1099-4300/24/1/55/htm

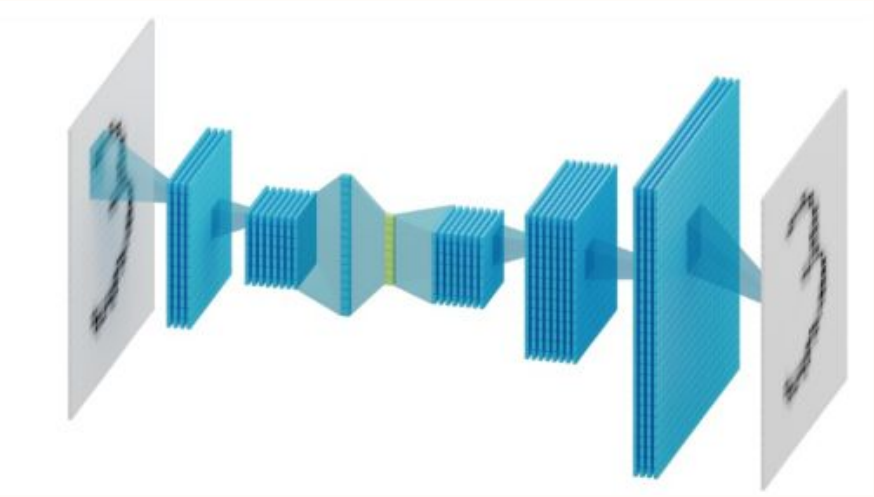


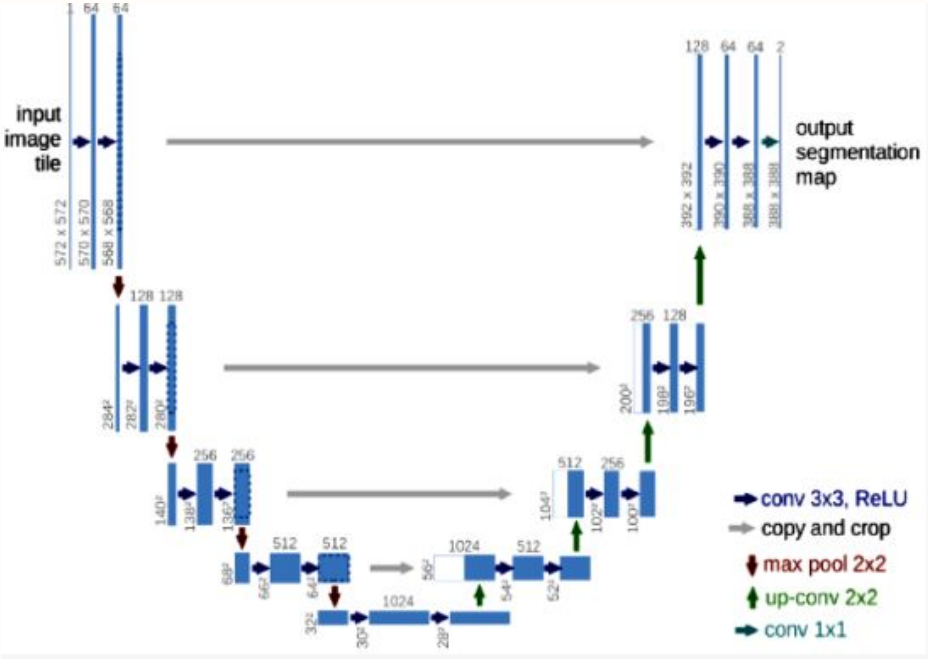
https://arxiv.org/pdf/2110.08386v1.pdf

Autoencoders

$$E : X \longrightarrow Cod$$
$$D : Cod \longrightarrow X$$
$$D(E(x)) \approx x$$



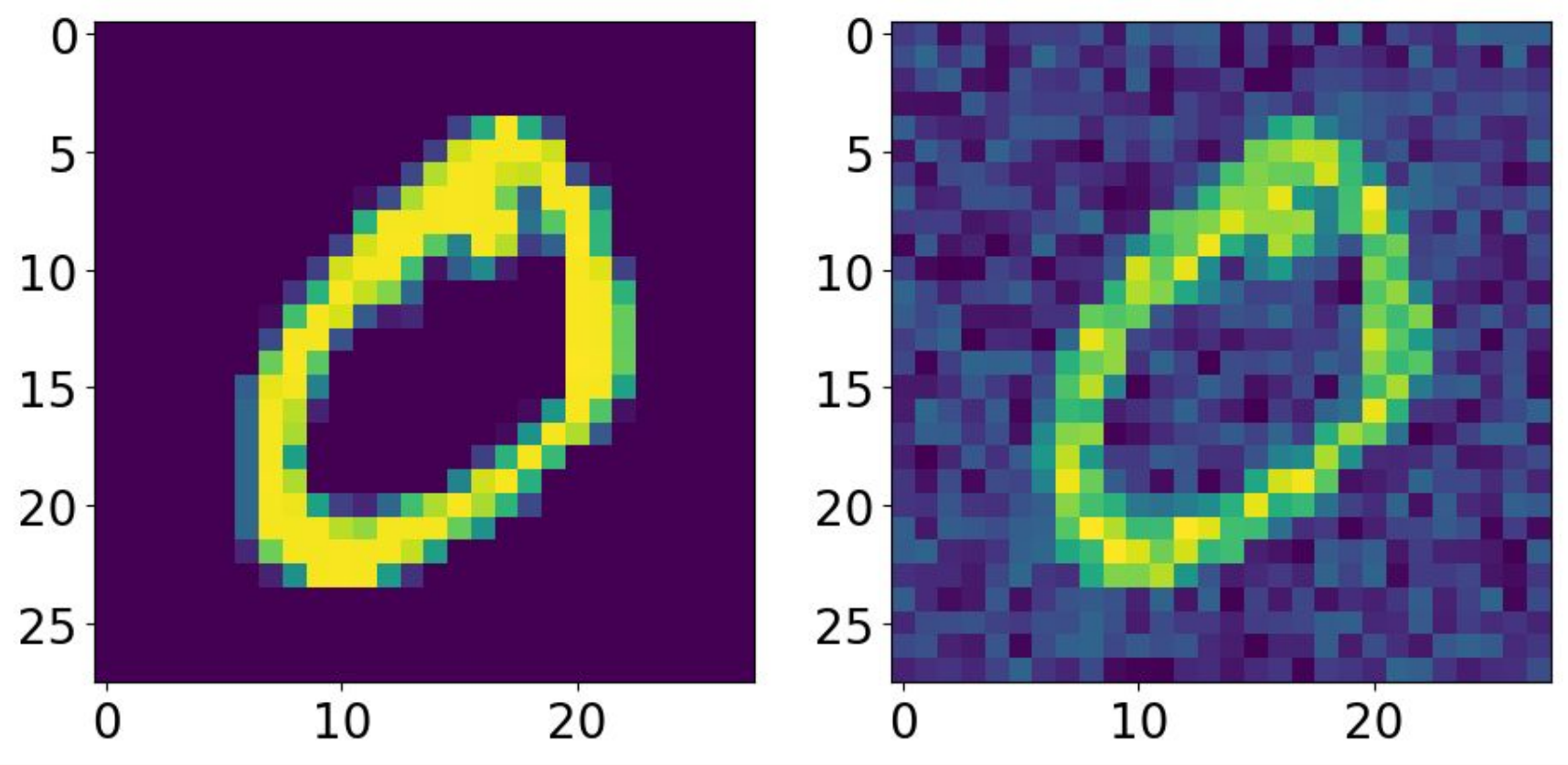




https://arxiv.org/pdf/2110.08386v1.pdf

https://www.mdpi.com/2075-4418/12/12/3064

Adicionar ruído



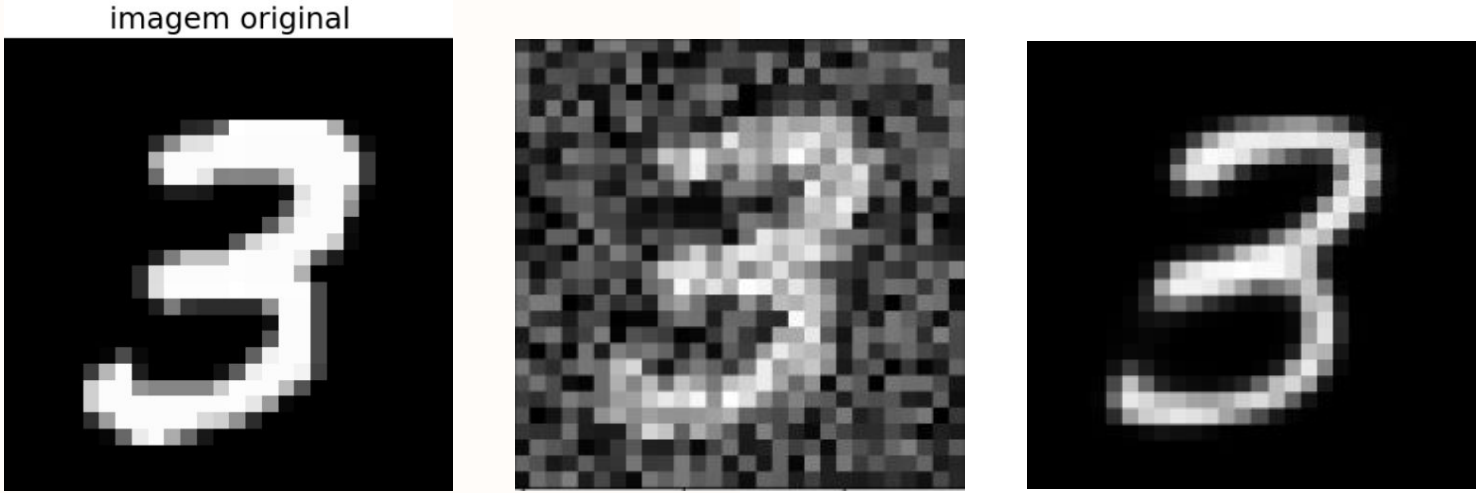
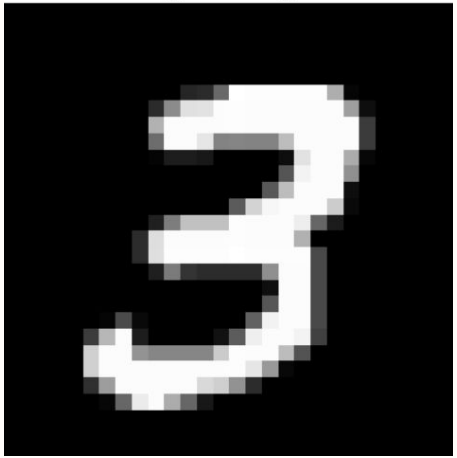
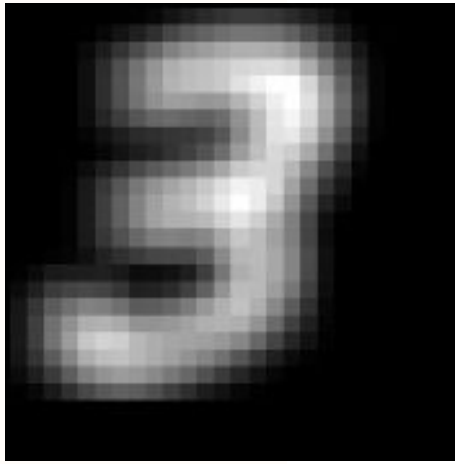
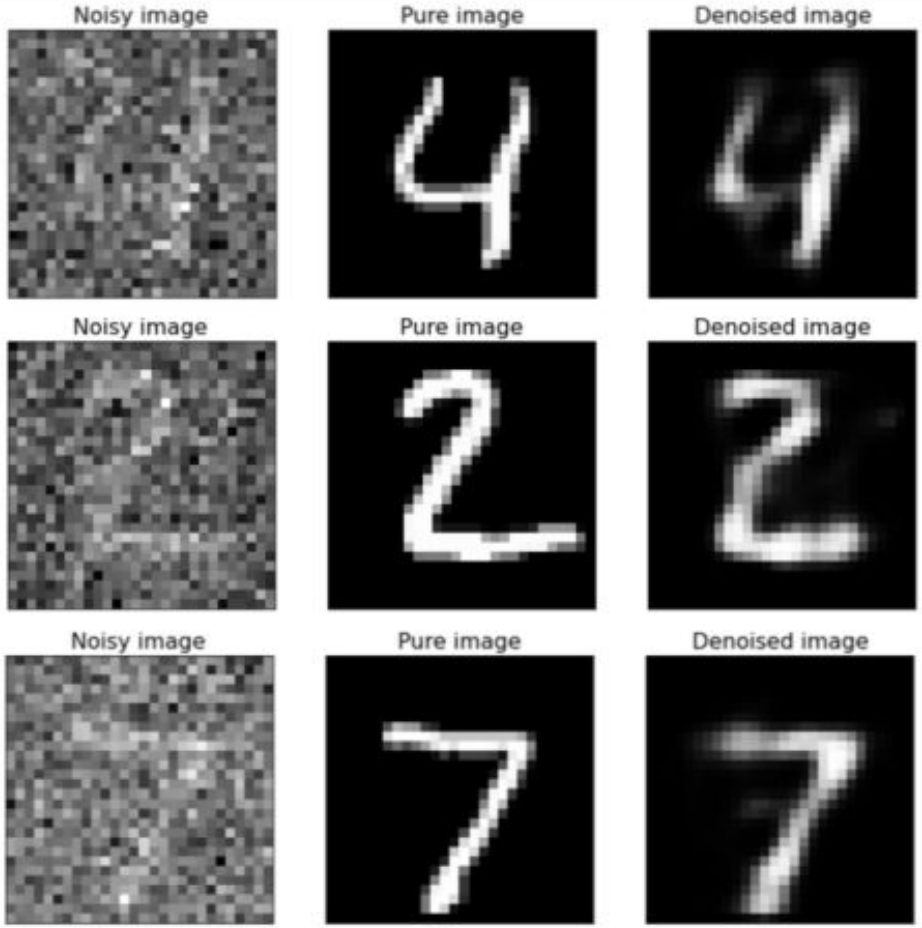


imagem original

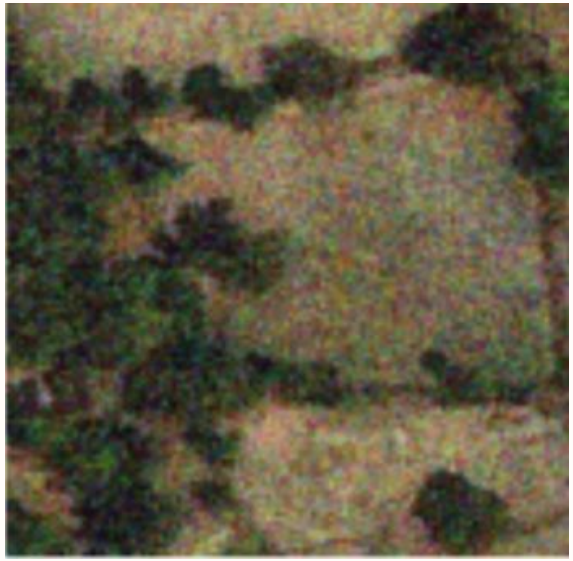
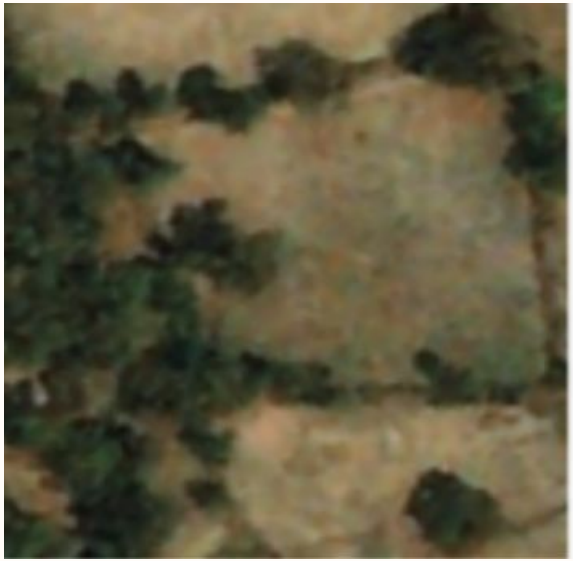
imagem original







https://arxiv.org/abs/2201.03898

Aerial Image Restoration

Outras técnicas

Desembaçar

$$I(u,v) = \mathscr{F}\{imagem(x,y)\}$$
$$B(u,v) = \mathscr{F}\{imagem\_borrada(x,y)\}$$
$$F(u,v) = \mathscr{F}\{filtro(x,y)\}$$
$$I(u,v) = \frac{B(u,v)}{F(u,v)}$$

Tirar ruído

Filtro passa baixa.