

Generative Adversarial Networks (GANs)

Jones Granatyr

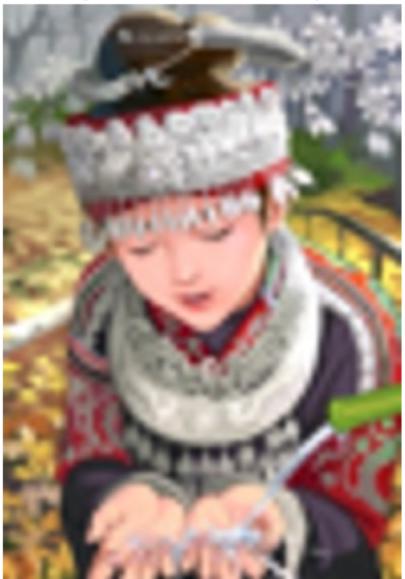


GANs

- Rede neural que pode criar por ela mesma
- Aprendem sobre os objetos do mundo e criam outras versões desses objetos que nunca existiram (como se fosse uma imaginação)
- Podem criar imagens a partir de textos

Aumento de resolução

bicubic
(21.59dB/0.6423)



SRResNet
(23.53dB/0.7832)



SRGAN
(21.15dB/0.6868)



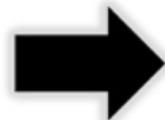
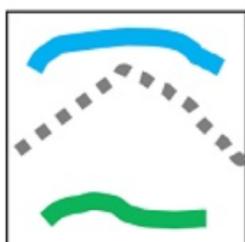
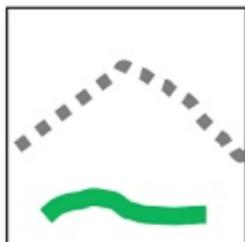
original



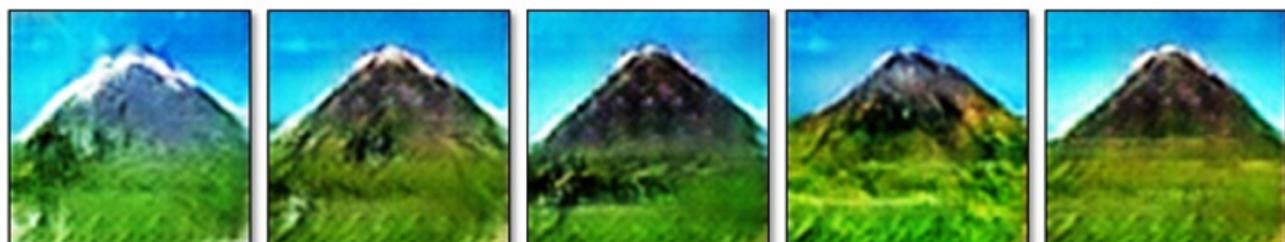
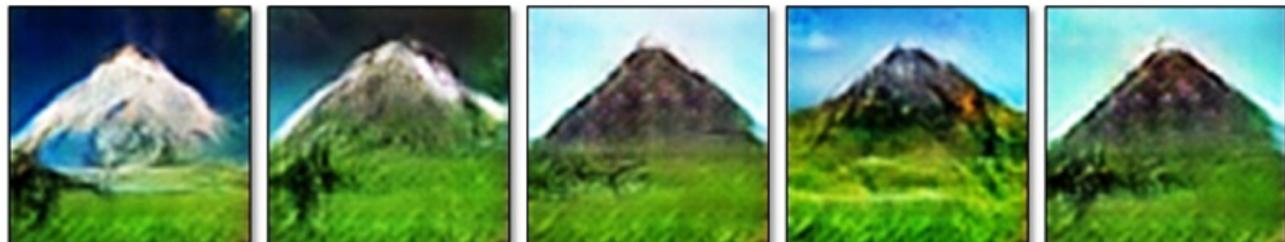
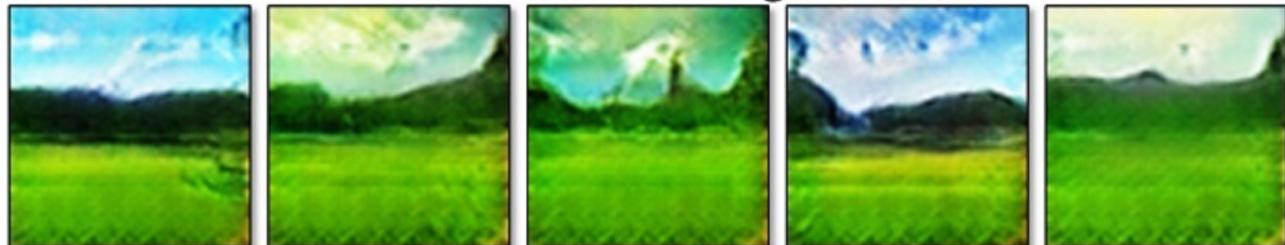
Fonte: <https://arxiv.org/pdf/1609.04802.pdf>

Desenho automático

User edits



Generated images



Texto para imagem

an all black bird
with a distinct
thick, rounded bill.



this small bird has
a yellow breast,
brown crown, and
black superciliary



a tiny bird, with a
tiny beak, tarsus and
feet, a blue crown,
blue coverts, and
black cheek patch



Tradução de imagem para imagem

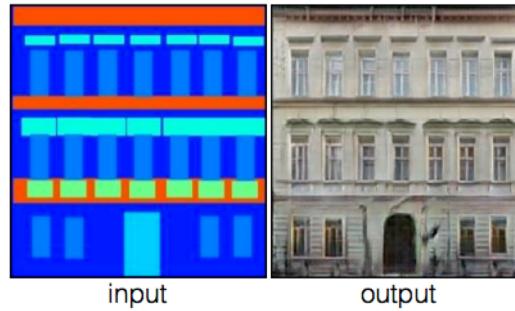
Labels to Street Scene



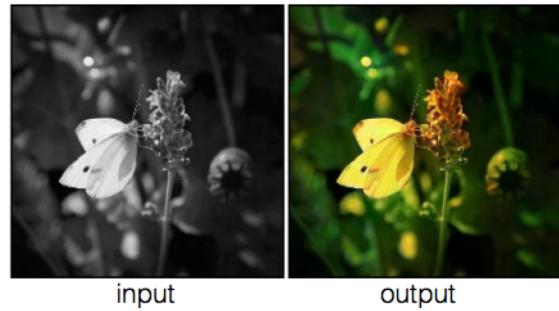
Aerial to Map



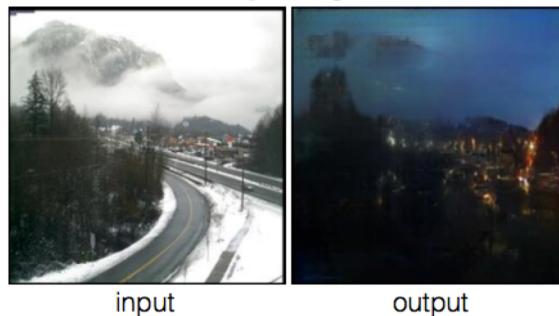
Labels to Facade



BW to Color



Day to Night



Edges to Photo



Geração de imagens (Google Deep Mind)



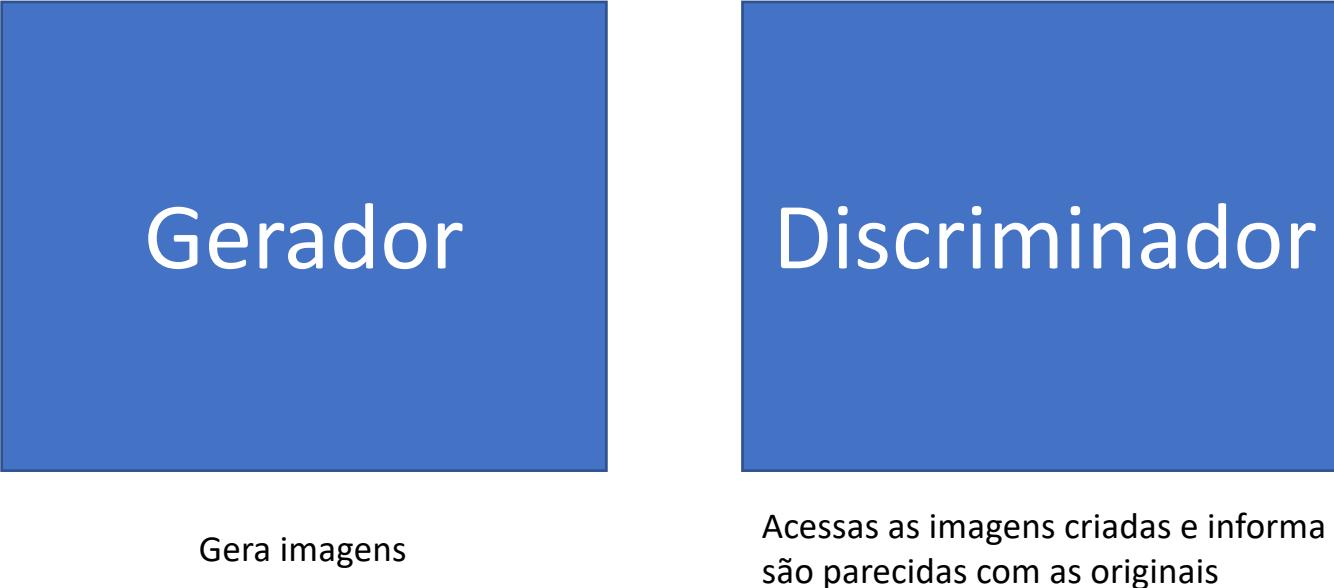
Criação de ambientes



Fonte: <https://arxiv.org/abs/1511.06434>

GANs

Começam do zero e aprendem sozinhos,
o gerador precisa aprender gerar imagens
e o discriminador precisa aprender a
avaliar as imagens



Gerador

Gera imagens

Discriminador

Acessas as imagens criadas e informa se elas
são parecidas com as originais



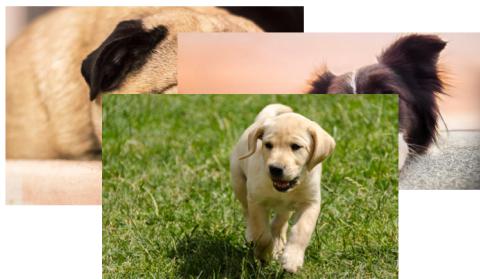
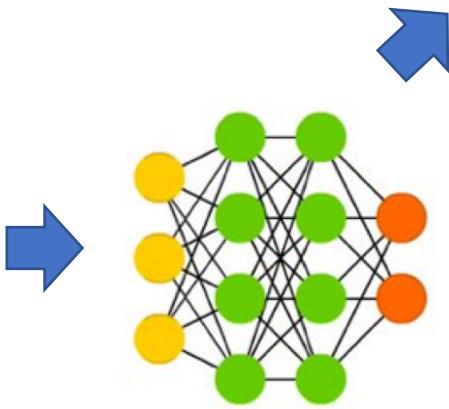
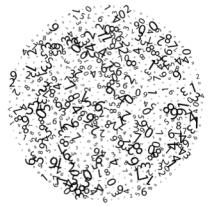
Gerador



Discriminador

Não
cachorro





Saída esperada = 0

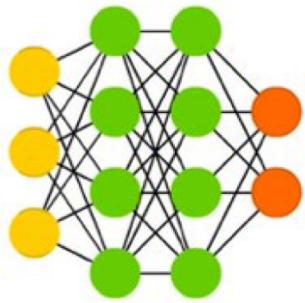
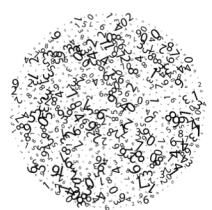
0.3
0.6
0.3

Saída esperada = 1

0.1
0.5
0.6

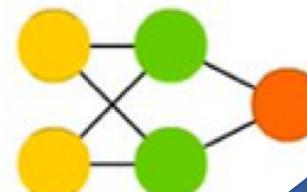
O discriminador não sabe o que são imagens de cachorros (não foi treinado)

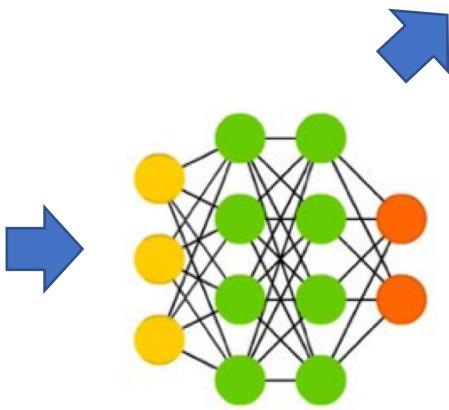
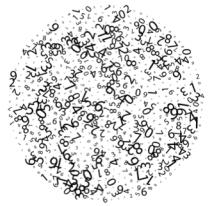
Retorna a probabilidade das imagens serem de cachorros



Compara com 1

0.3
0.6
0.3



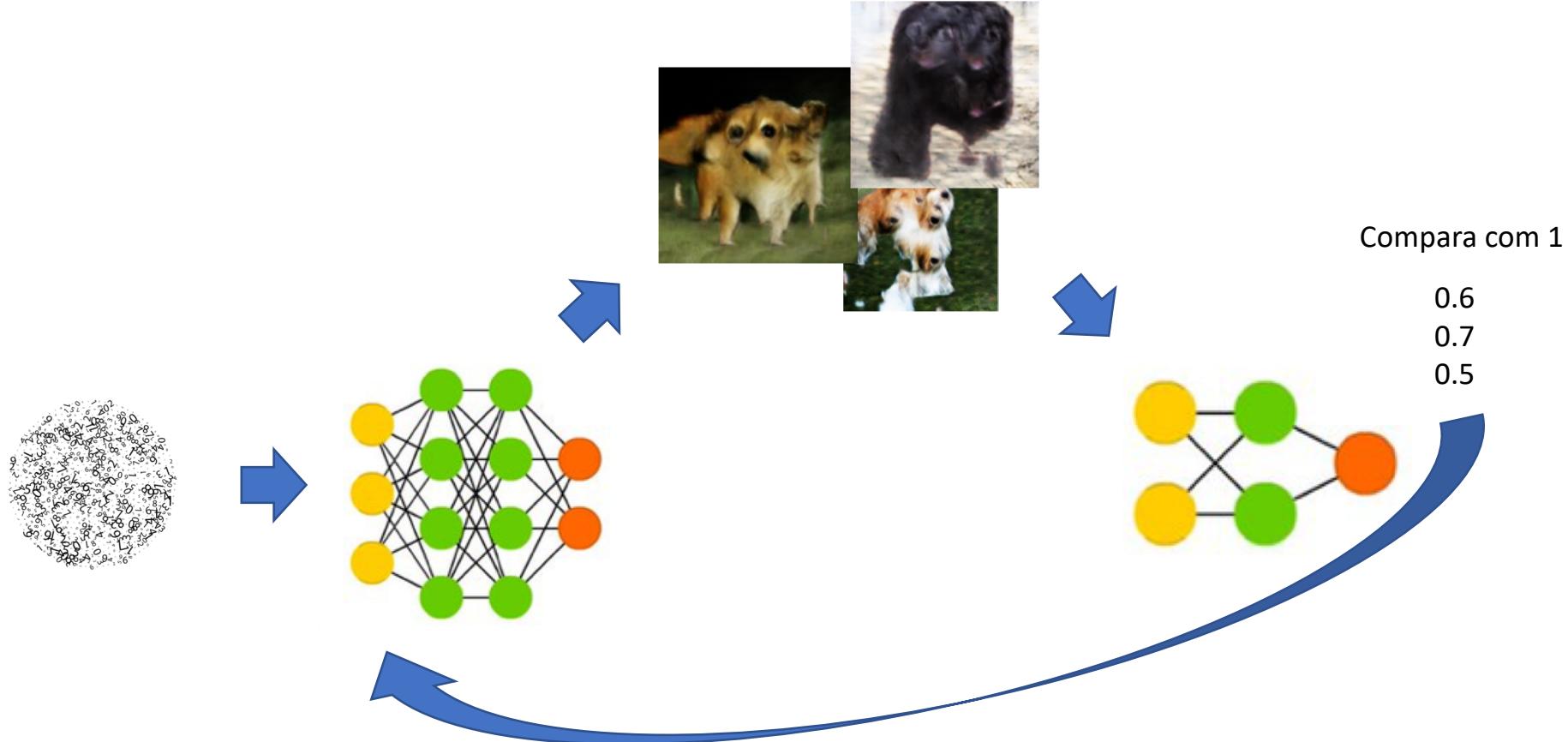


Saída
esperada = 0

0.1
0.5
0.2

Saída
esperada = 1

0.4
0.6
0.8



O gerador envia algumas imagens para o discriminador analisar, que indica o que deve ser melhorado para ser um cachorro

Conclusão

