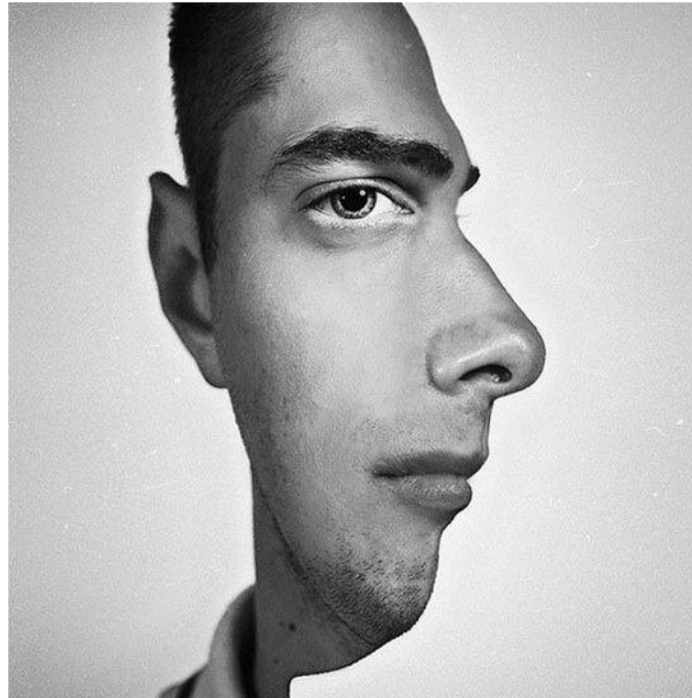


# Convolutional Neural Networks

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# Convolutional Neural Networks

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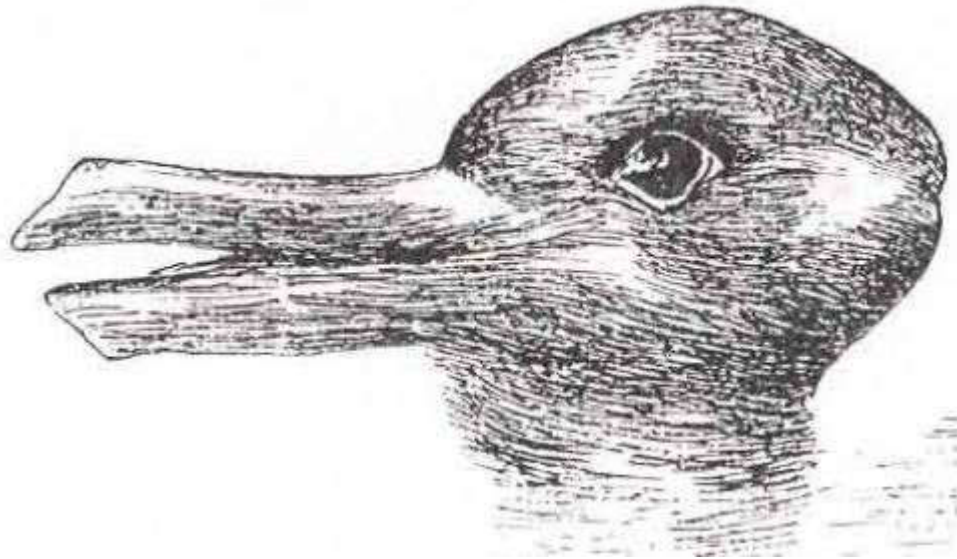
# Convolutional Neural Networks

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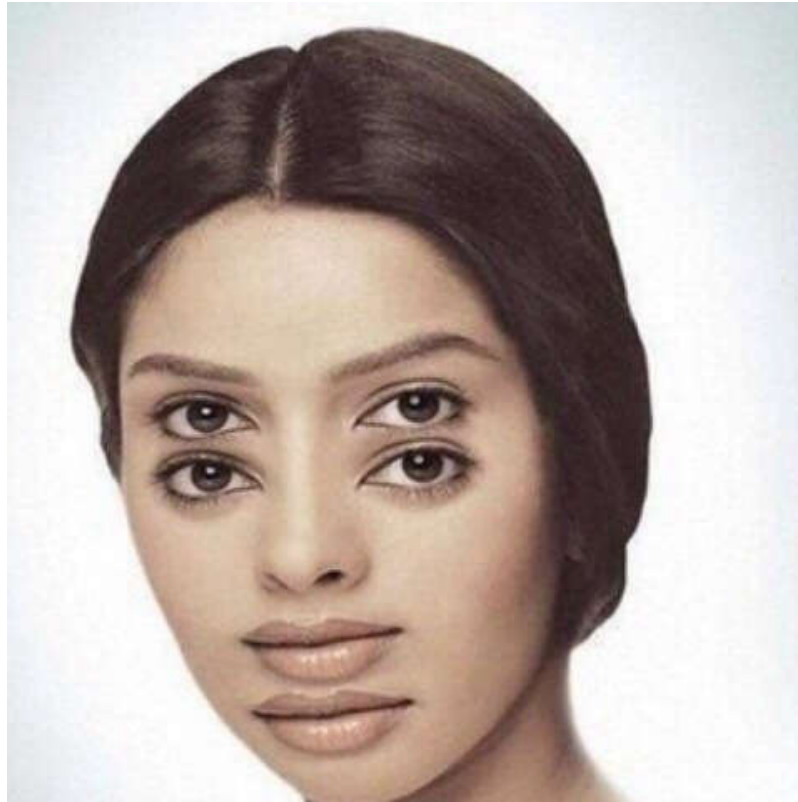
# Convolutional Neural Networks

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# Convolutional Neural Networks

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# Convolutional Neural Networks

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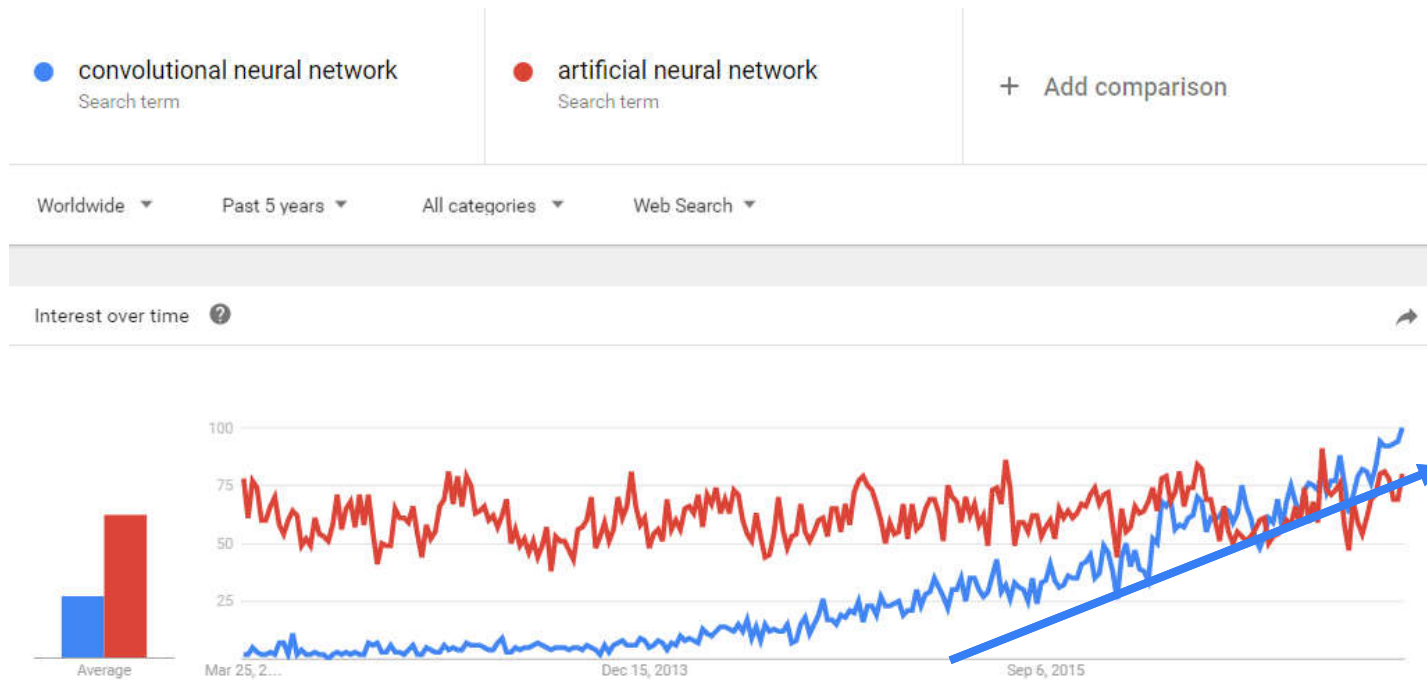
Examples from the test set  
(with the network's guesses)



*Fonte da imagem: palestra de Geoffrey Hinton*

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# Convolutional Neural Networks



Fonte: google trends

# Convolutional Neural Networks

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Yann Lecun

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# Convolutional Neural Networks

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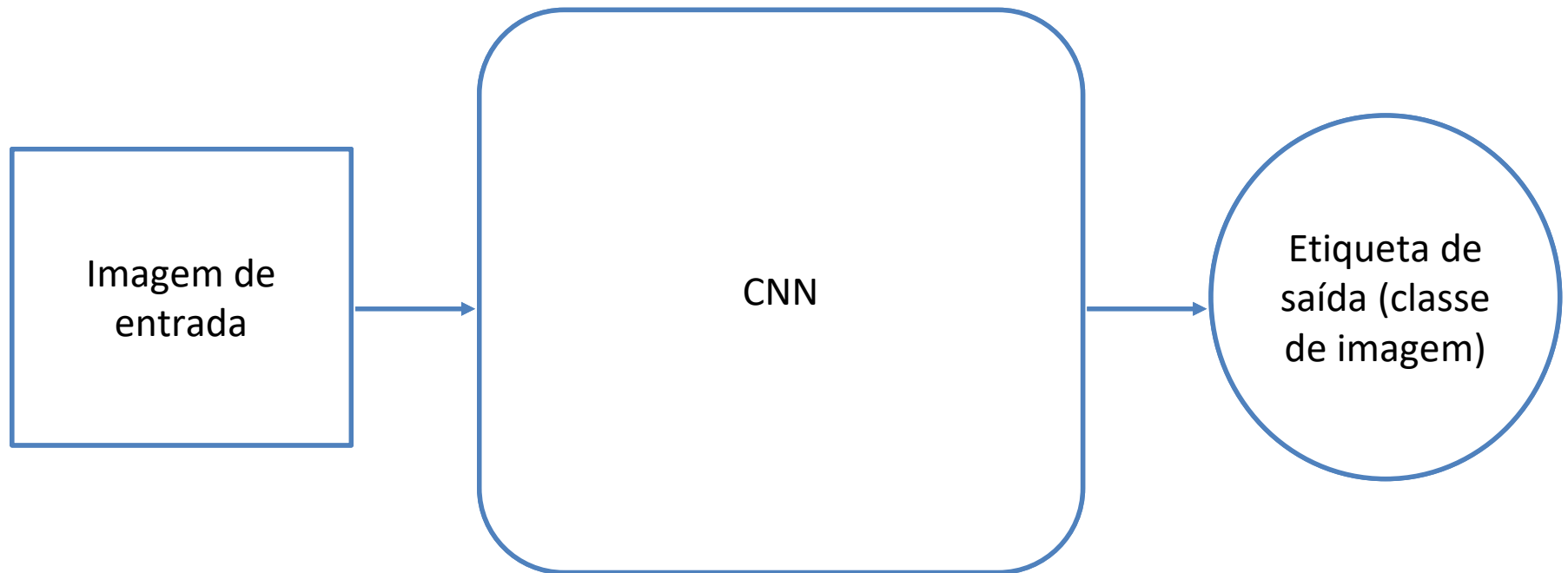
Google

Facebook



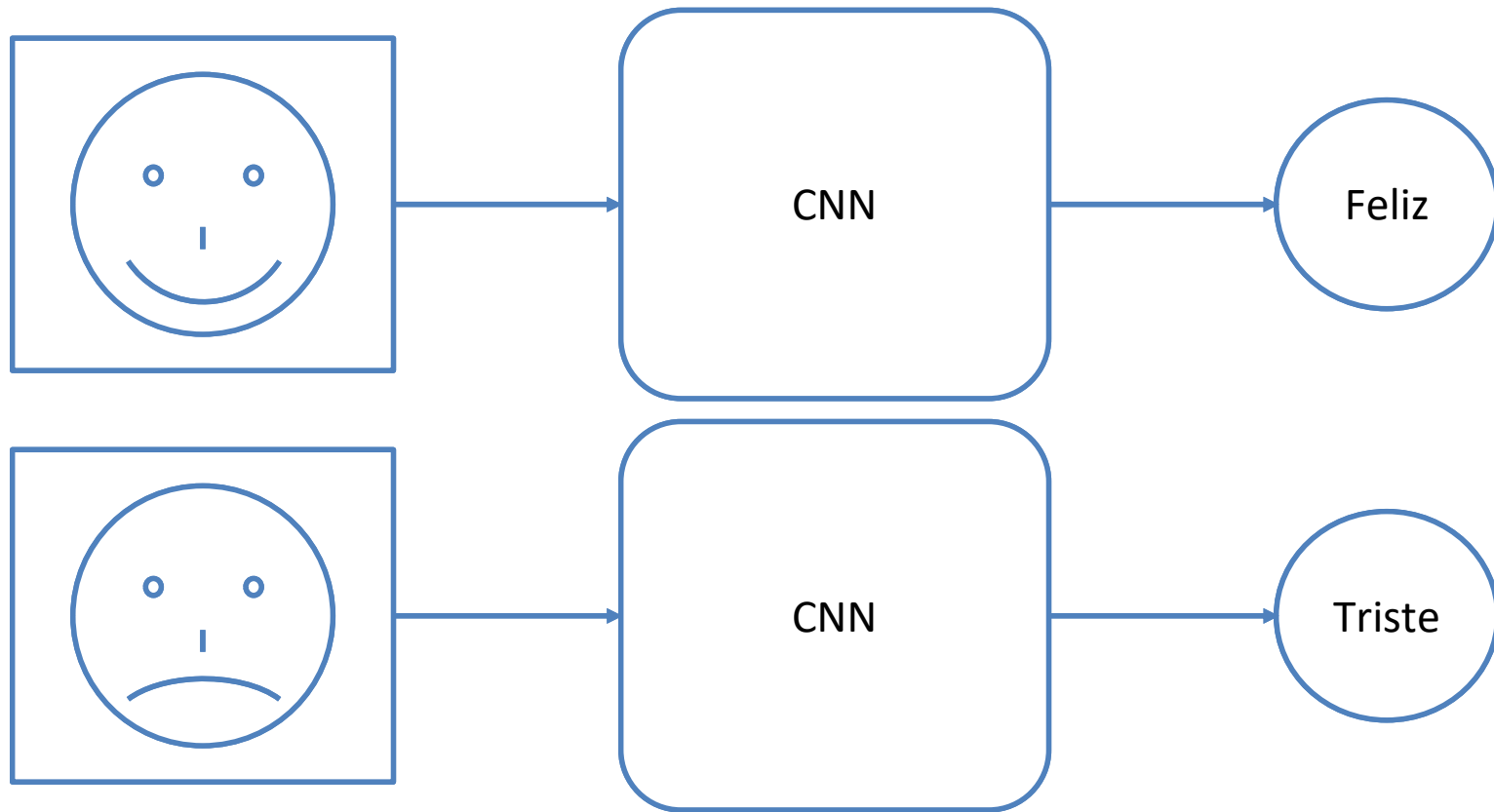
# Convolutional Neural Networks

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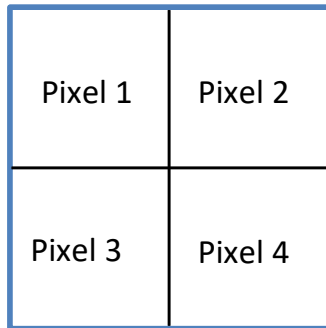
# Convolutional Neural Networks

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# Convolutional Neural Networks

Imagem P / B 2x2px



Matriz 2d

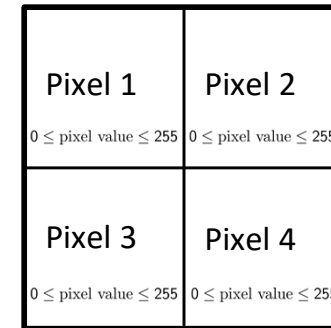
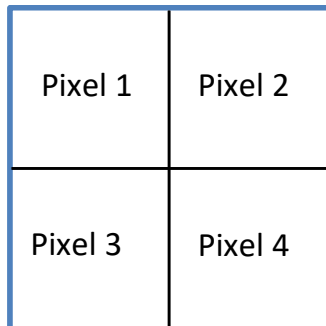


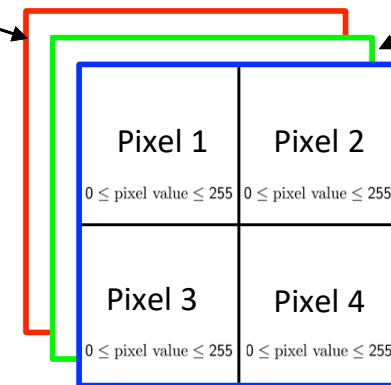
Imagem colorida 2x2px



Matriz 3d

Canal  
vermelho

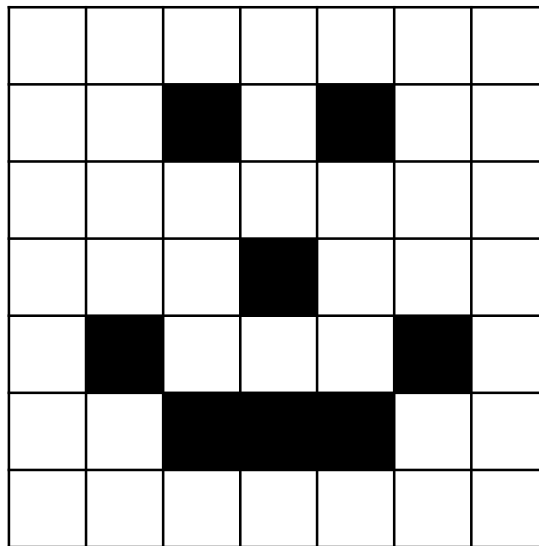
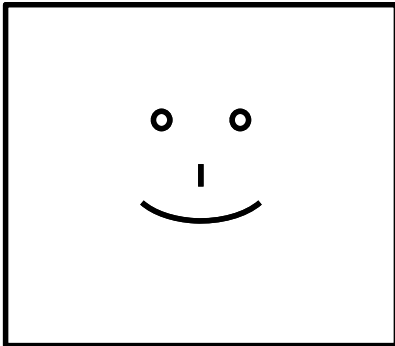
Canal verde



Canal azul

# Convolutional Neural Networks

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0	0	0	0	0	0	0
0	1	0	0	0	1	0
0	0	0	0	0	0	0
0	0	0	1	0	0	0
0	1	0	0	0	1	0
0	0	1	1	1	0	0
0	0	0	0	0	0	0

# Redes neurais convolucionais

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PASSO 1: Convolution



PASSO 2: Max Pooling



ETAPA 3: Flattening



PASSO 4: Full Connection



# Redes neurais convolucionais

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**Leitura adicional:**

*Gradient-Based Learning Applied to Document Recognition*

Por YannLeCun et al. (1998)

Link:

<http://yann.lecun.com/exdb/publis/pdf/lecun-01a.pdf>

