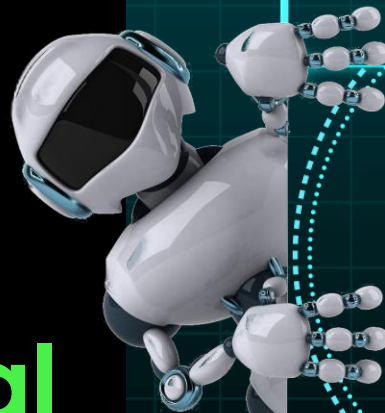


Introdução à Visão Computacional



Prof. Dr. Diego Renan Bruno

Education Tech Lead na DIO

Doutor em Robótica e *Machine Learning* pelo ICMC-USP



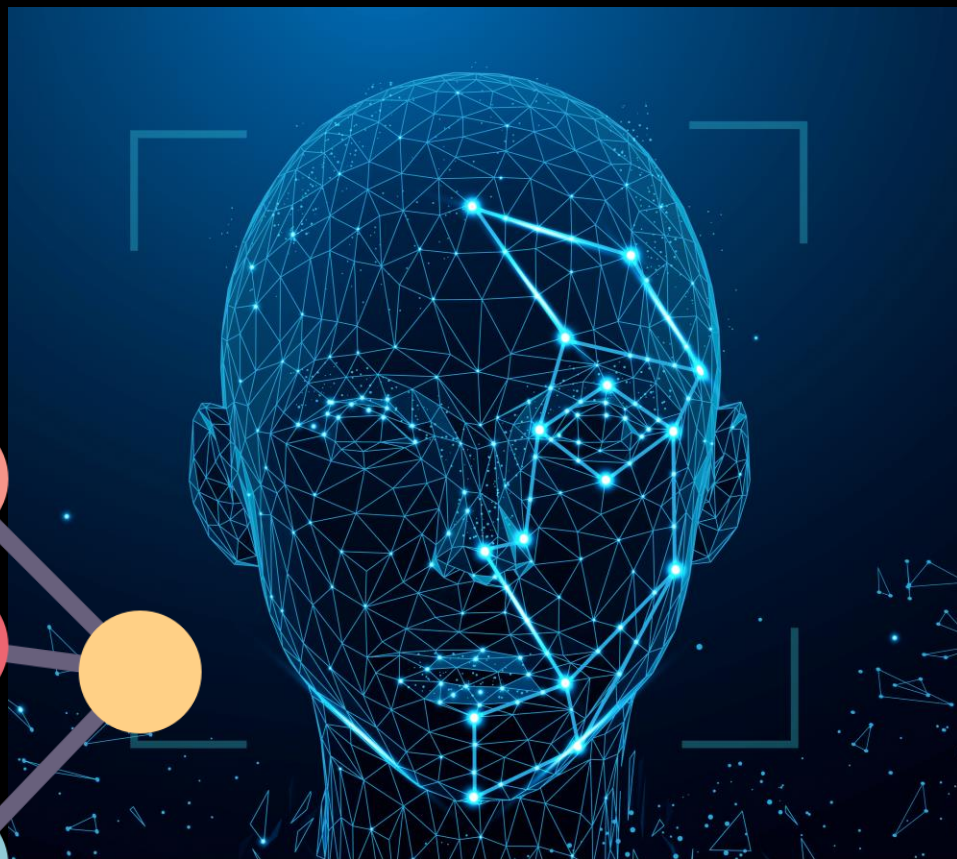
**MACHINE
LEARNING
DAY**



OpenCV

Detecção e Reconhecimento Facial com **Deep Learning**

Machine Learning



O mundo da IA...

IA Geral



IA Restrita



Machine Learning

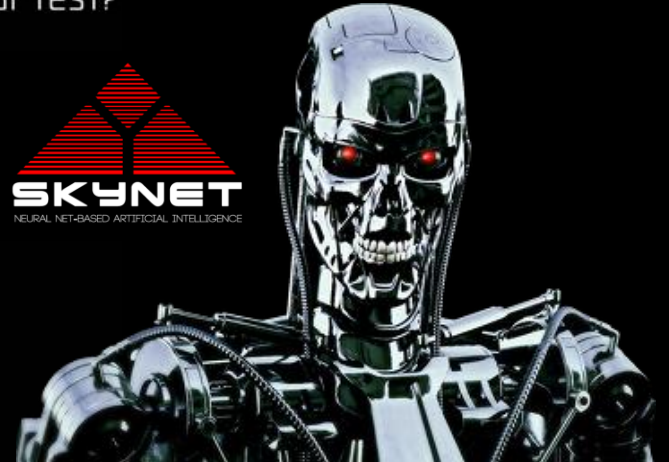
ex machina

WHAT HAPPENS TO ME IF I FAIL YOUR TEST?



ARTIFICIAL INTELLIGENCE


SKYNET
NEURAL NET-BASED ARTIFICIAL INTELLIGENCE



O que é Visão Computacional?



Sensoriamento:
Imagens



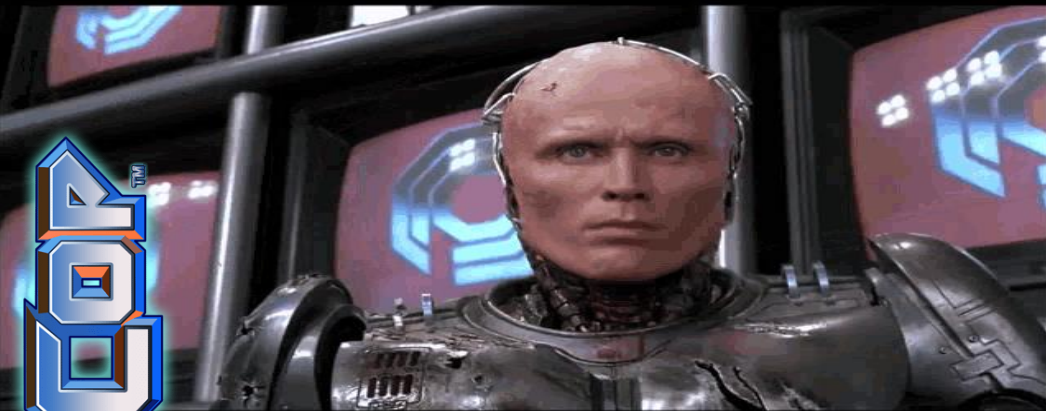
Processamento
De Imagens



Análise: *Machine Learning*

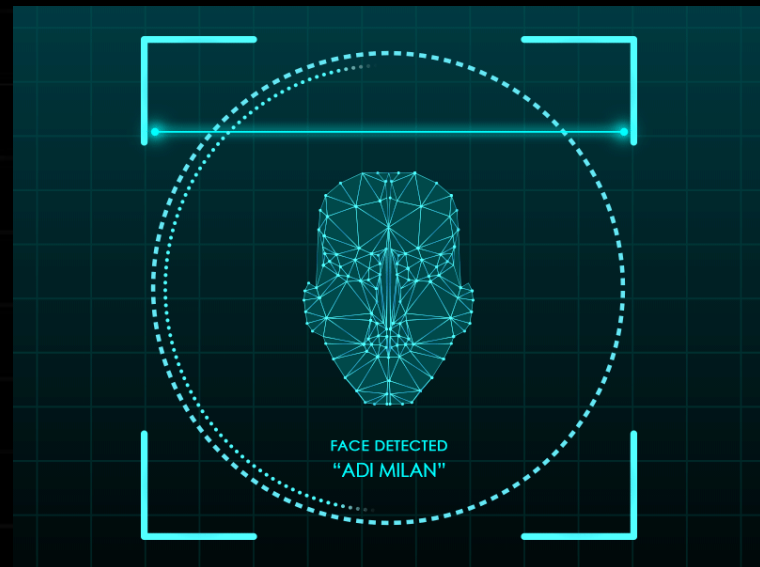


Reconhecimento de Pessoas



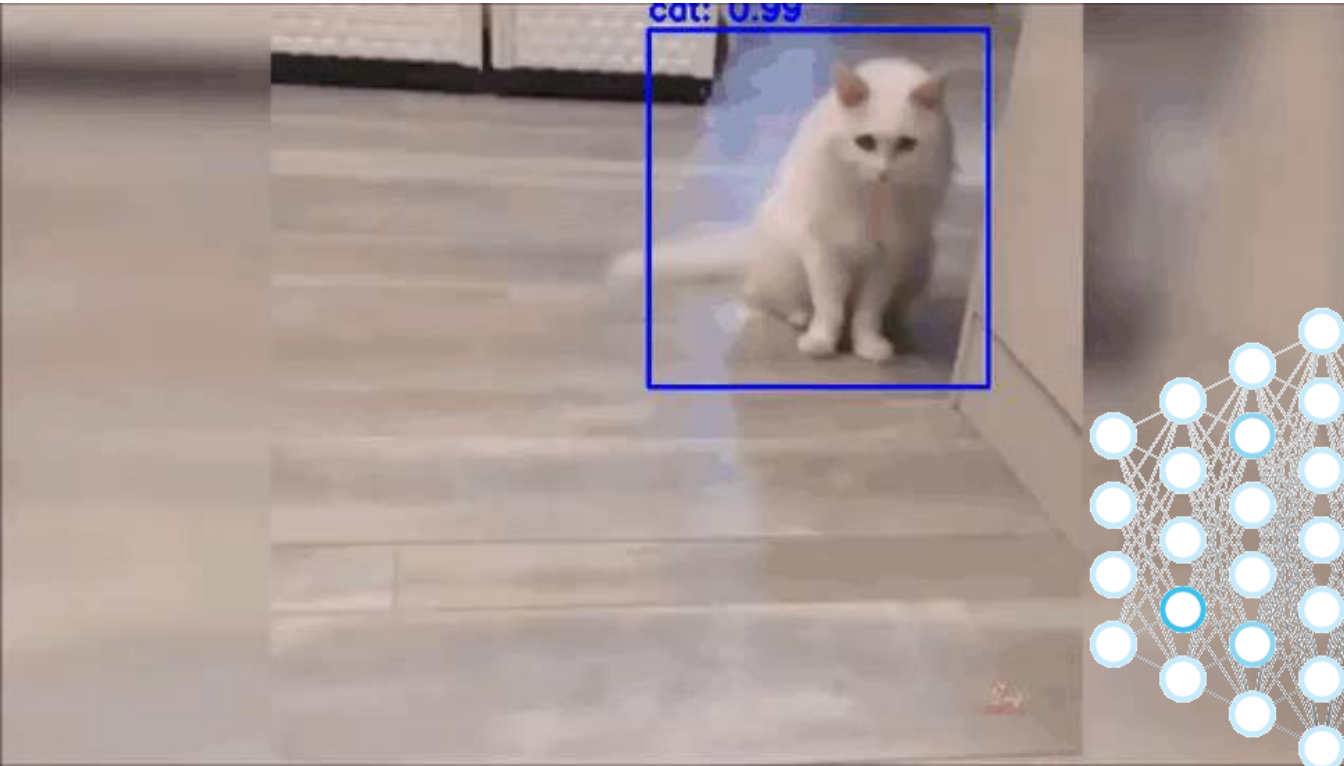
Posicionamento da câmera

Posição da captura da imagem:



Detecção em imagens

→ Detecção de objetos:



Detecção em imagens

→ Detecção de objetos:

Classification



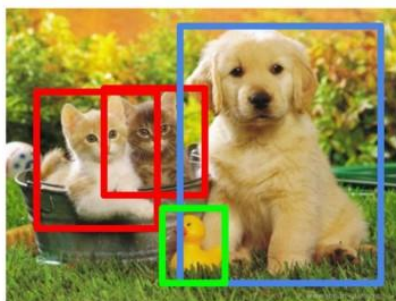
CAT

**Classification
+ Localization**



CAT

Object Detection



CAT, DOG, DUCK

**Instance
Segmentation**



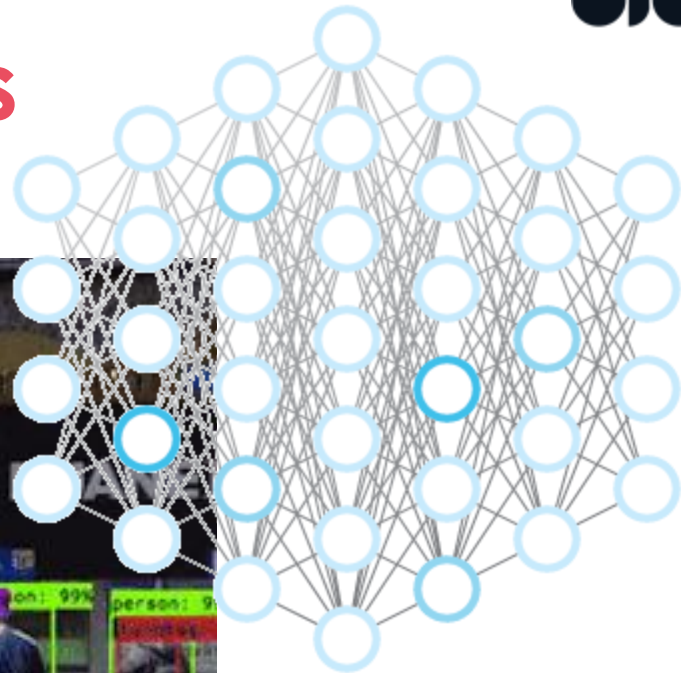
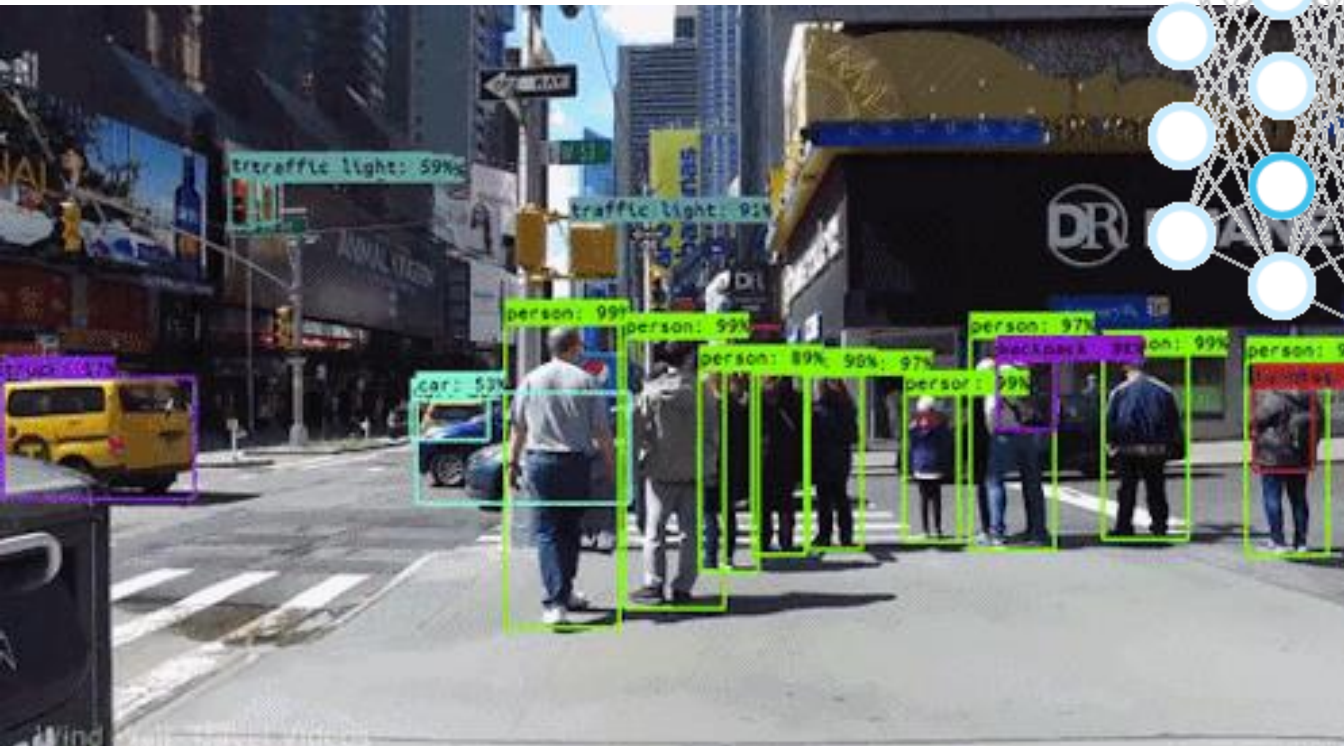
CAT, DOG, DUCK

Single object

Multiple objects

Detecção em imagens

→ Detecção de objetos:



Detecção de objetos em imagens

→ O objeto deve ser
detectado e classificado:



FACE RECOGNITION IS UNDER WAY...

Extração de *Features* da face humana



Imagem Original

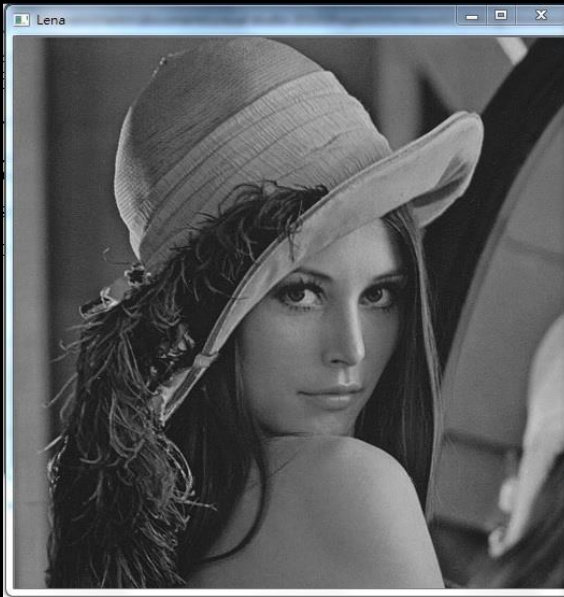
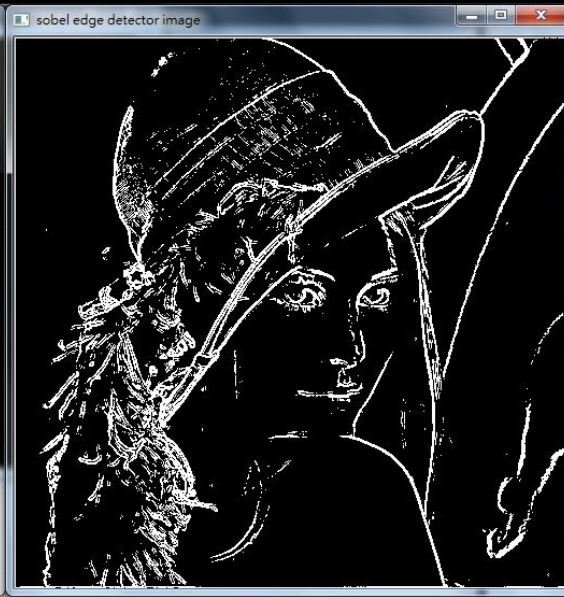


Imagem em tons de cinza



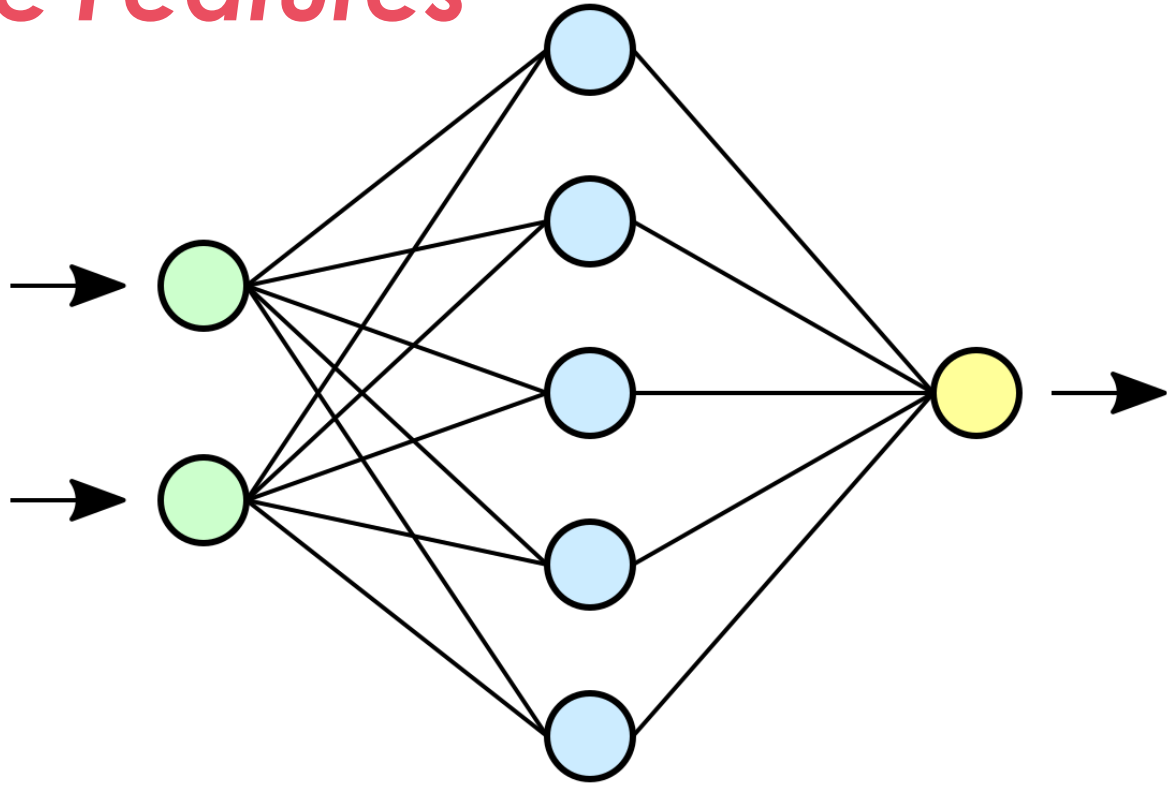
Detecção de bordas

Extração de *Features*

→ Filtro de bordas:



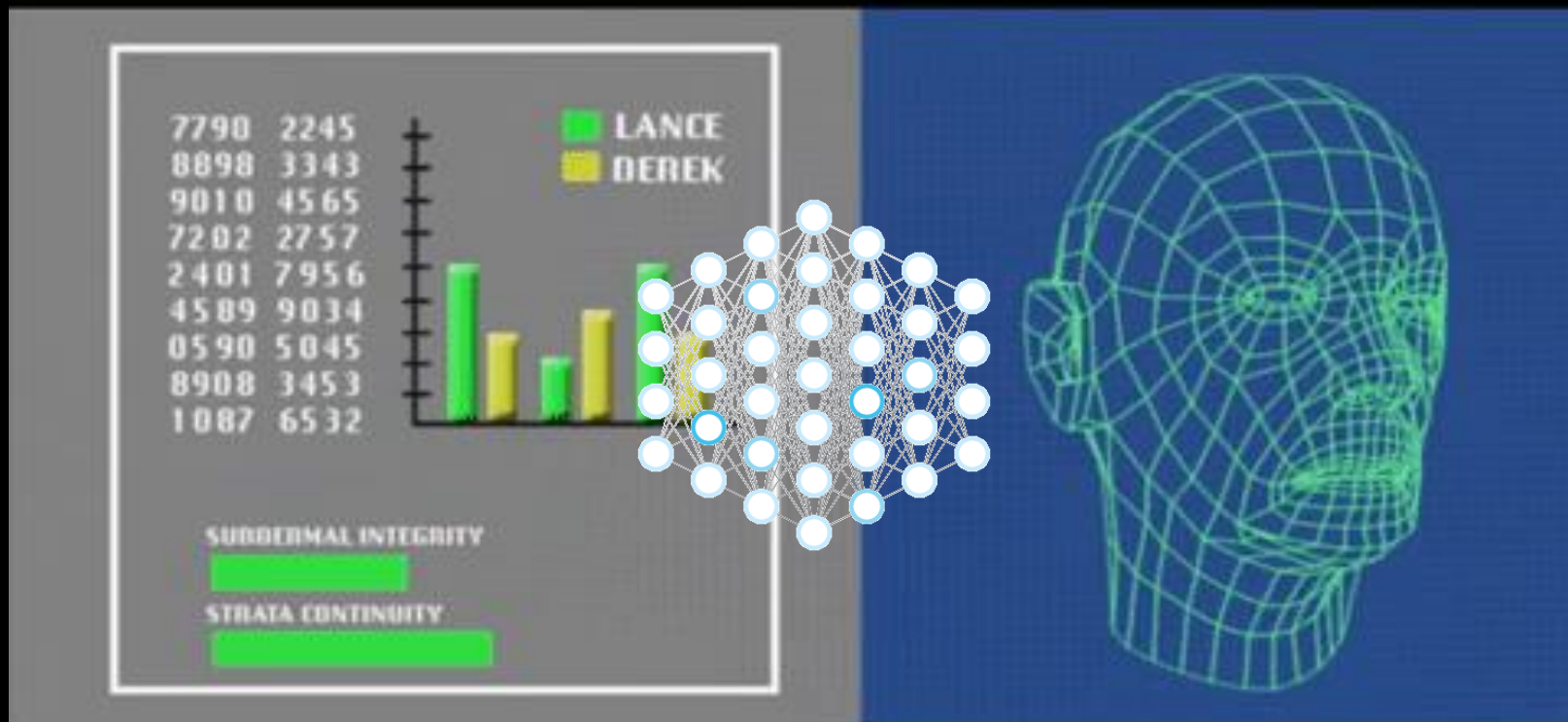
Features



Classificação

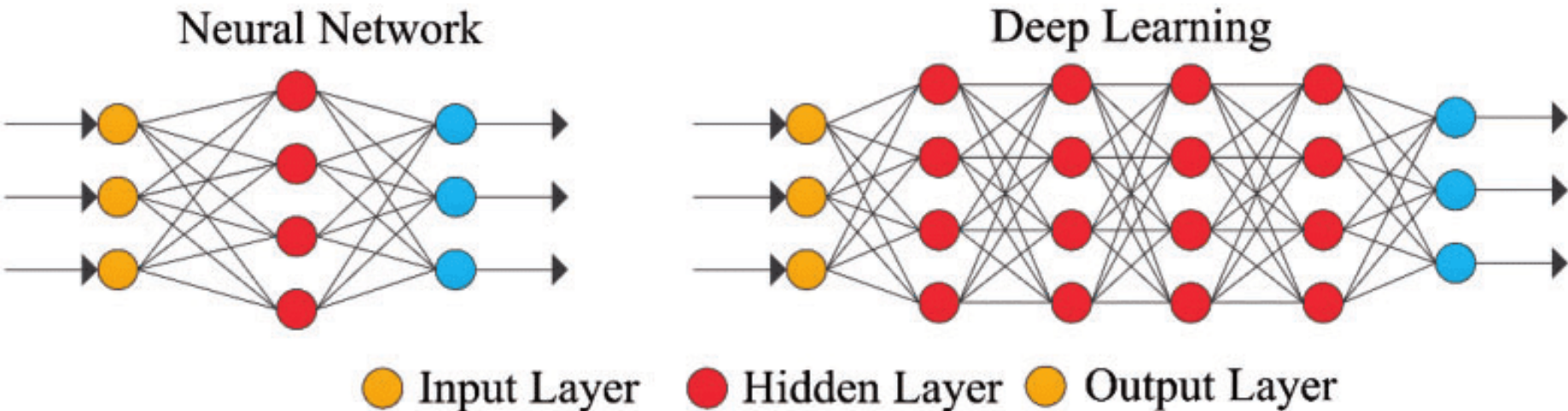
Extração de *Features* da face humana

Atualmente com redes de *Deep Learning*



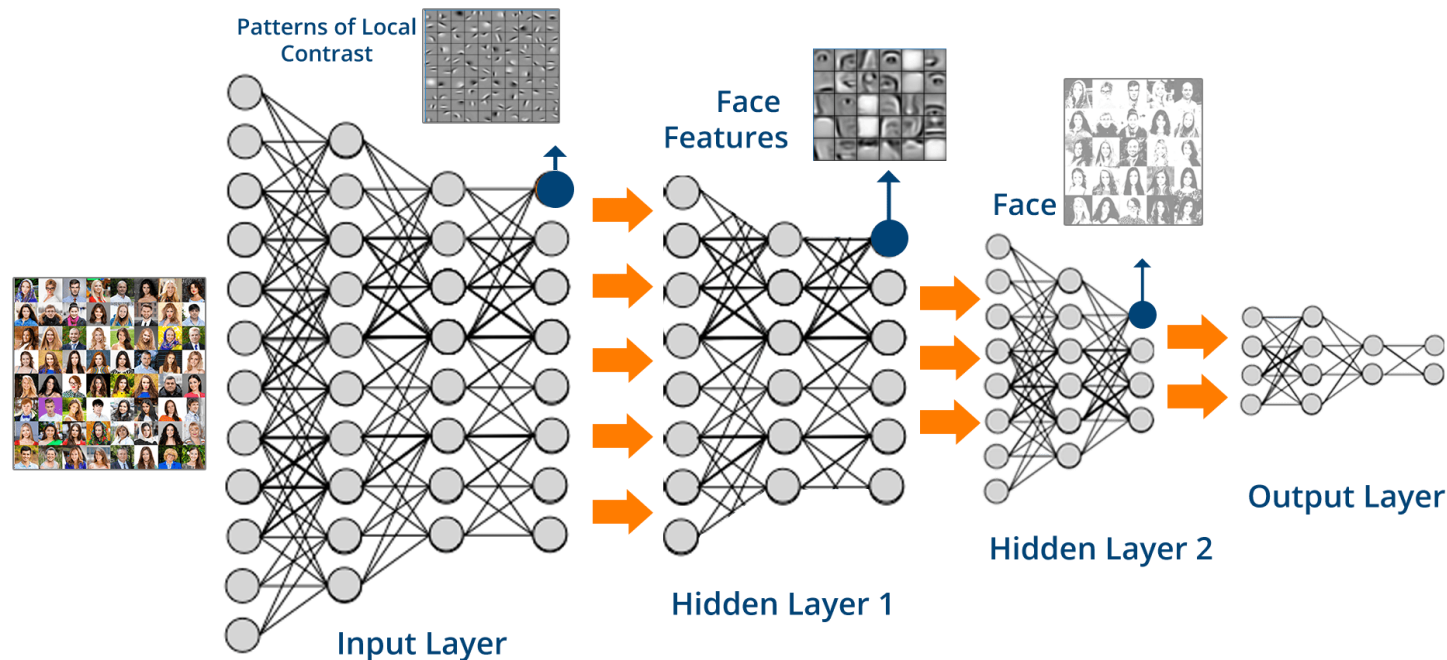
Aprendizado com *Deep Learning*

→ Extração de *features* automática:



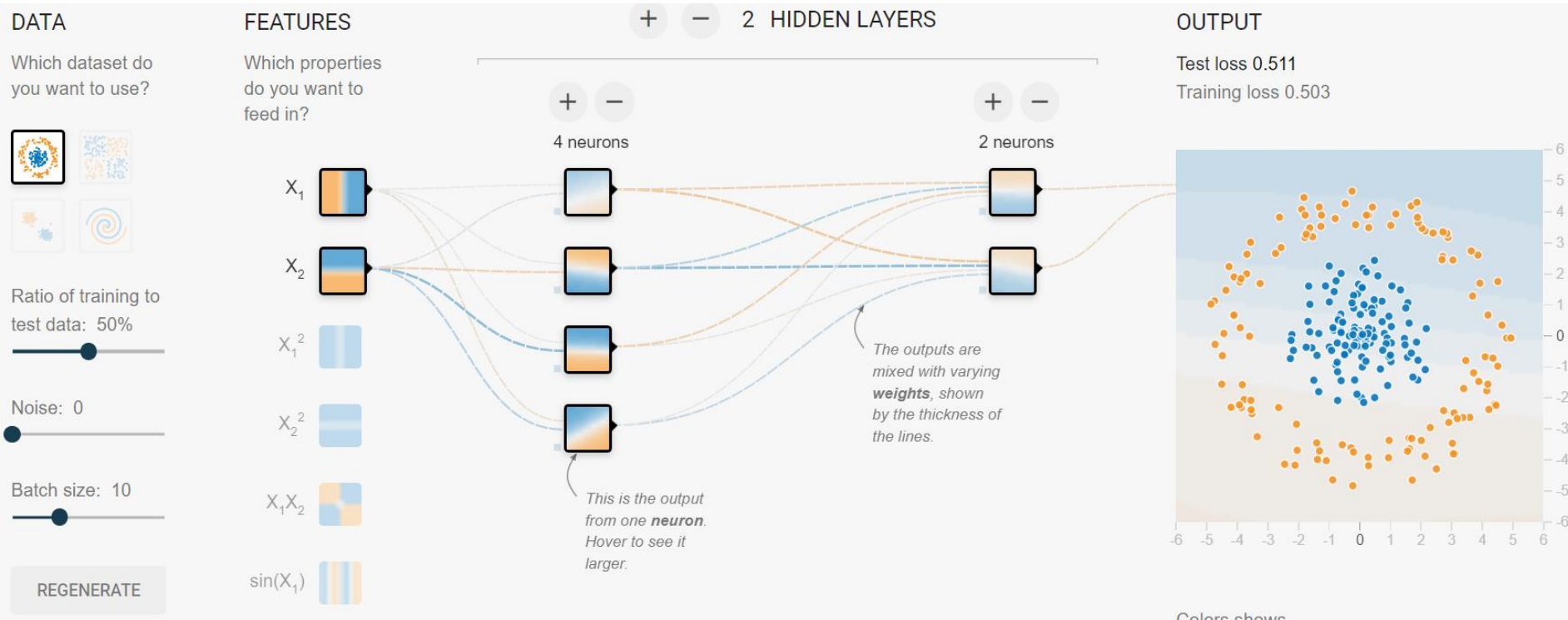
Aprendizado com *Deep Learning*

→ Extração de *features* automática:



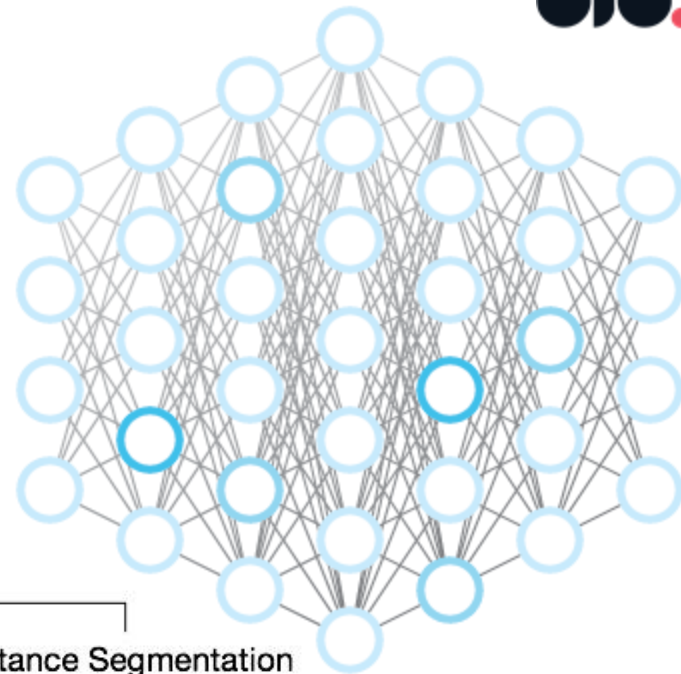
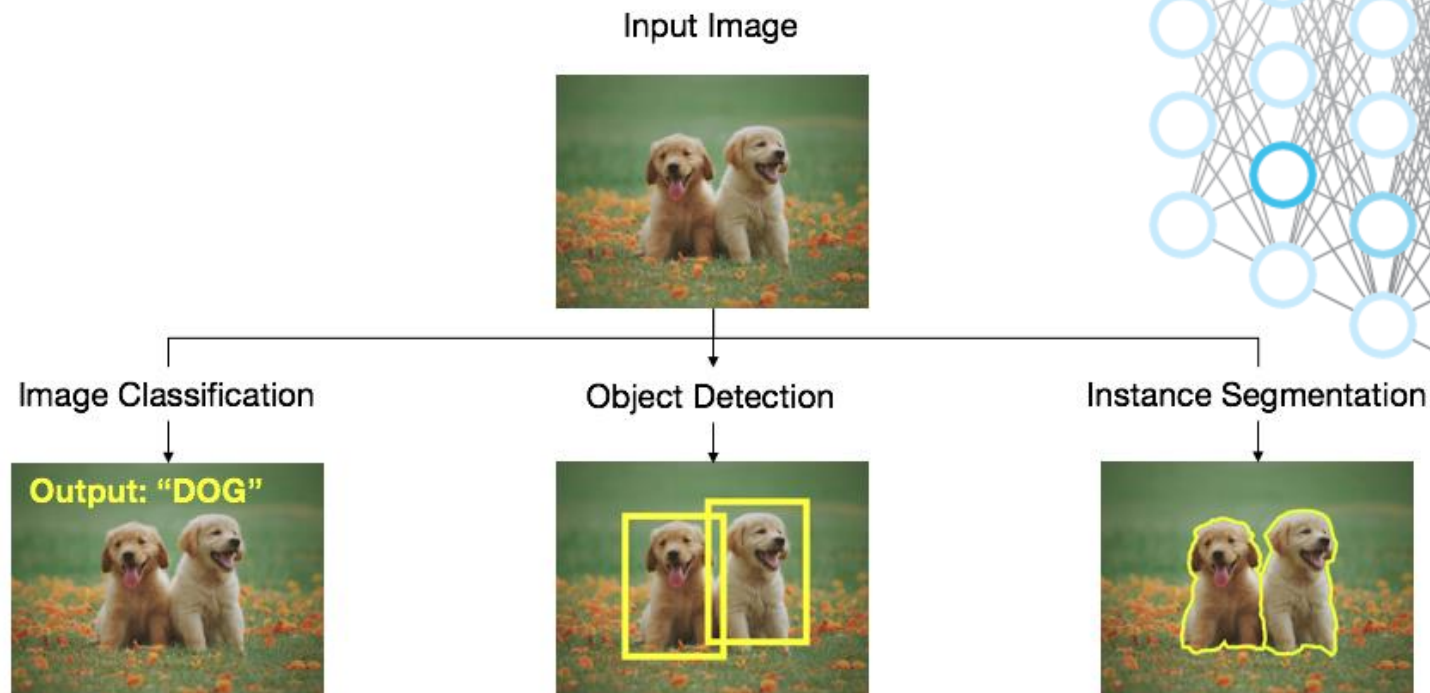
Playground TensorFlow

→ Estruturas de Redes de *Deep Learning*:



Detecção em imagens

→ Detecção de objetos:



→ Detecção

→ Classificação



Vamos aprender a detectar e reconhecer faces humanas...

Detecção de imagens

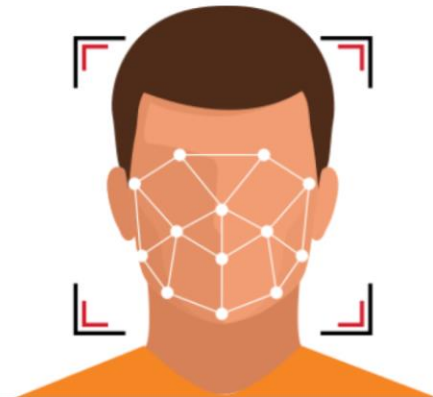
People with no idea about AI, telling me my AI will destroy the world

Me wondering why my neural network is classifying a cat as a dog..



Como criar o *Dataset*?

→ Criando sua base de dados:



Base de dados: Curiosidades

→ Rotulação de objetos:



Base de dados: Curiosidades

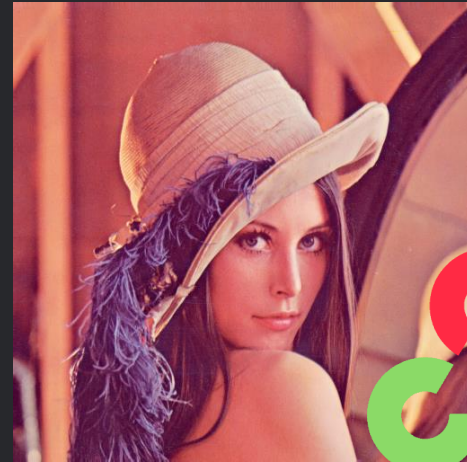
→ Rotulação de objetos:



Obrigado!

Machine Learning

Prof. Dr. Diego Bruno



OpenCV