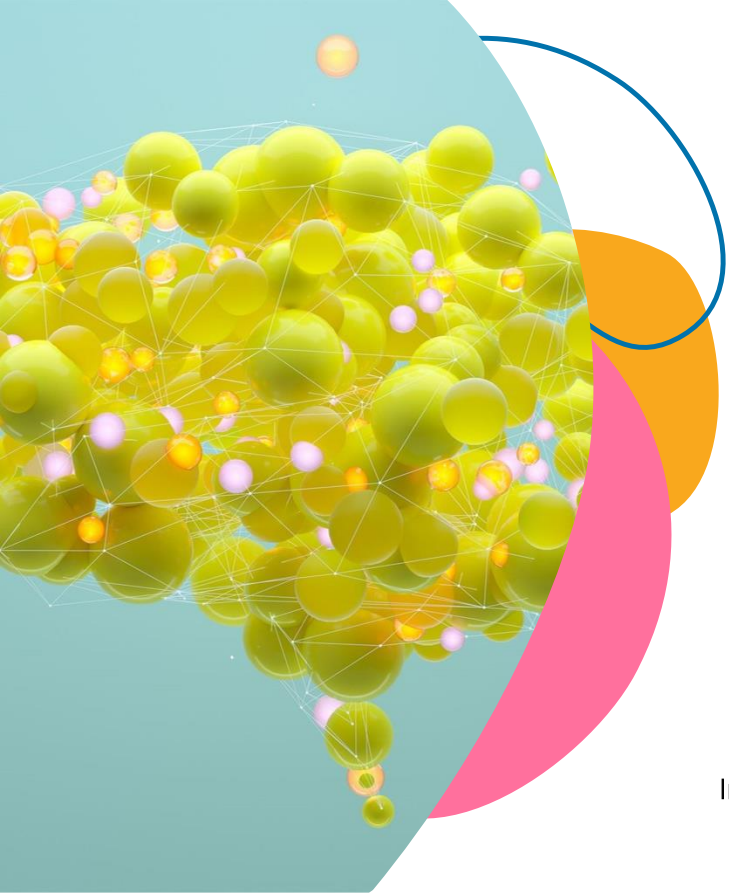

Introduction to Neural Network and Deep Learning

Instructor: 1. Asst. Prof. Dr. Jarunee Duangsuwan
2. Dr. Wannipa Panyasuphakul

344-461 Nueral Networks and Deep Learning 2/2568

https://www.facebook.com/share/g/19prNP7Ytu/

Overview

1. Introduction to this coursework
2. Real World Used Cases
3. Introduction to Neural Network and Deep Learning
4. Deep Learning Frameworks and Tool
5. Playground: Just Run the CODE!

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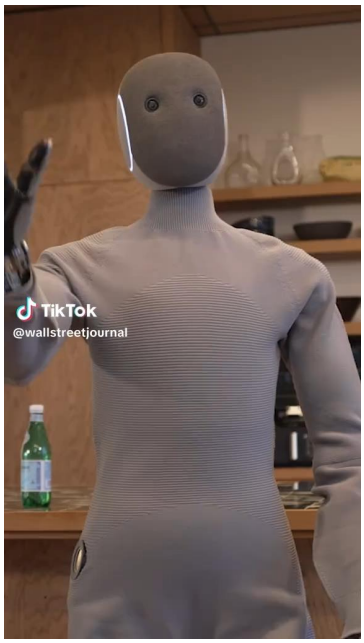
Real-World Used Cases

2025



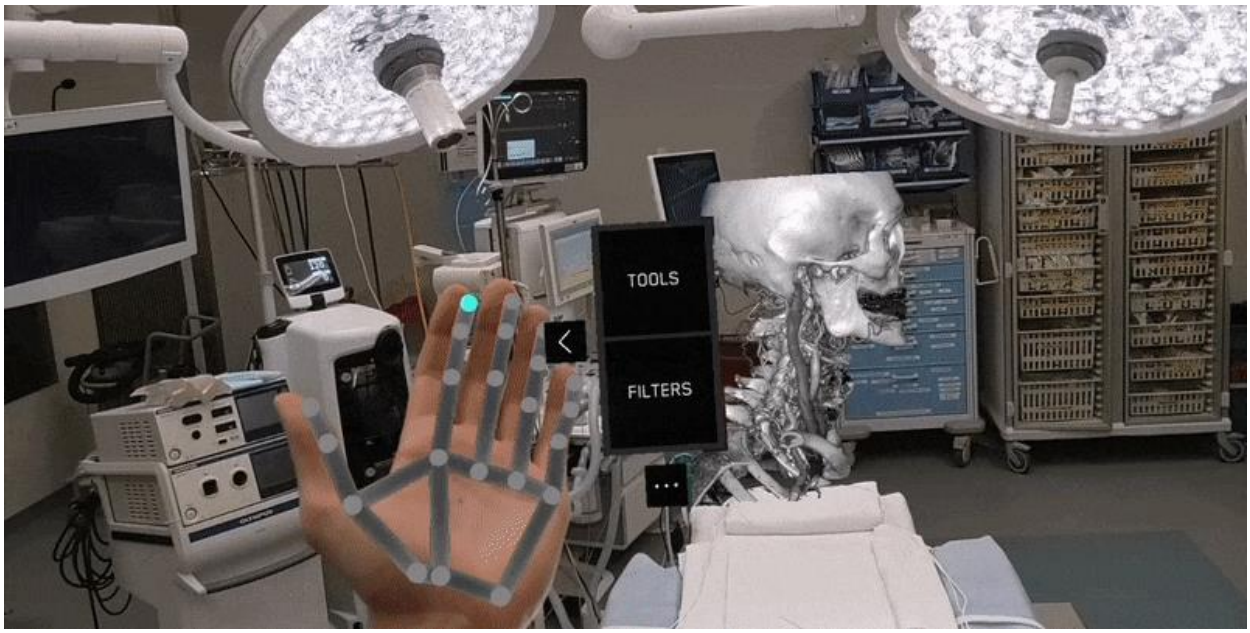
Humanoid
1X Neo

https://www.tiktok.com/@wallstreetjournal/video/7566398674587192631?q=humanoid%20neo&t=1763147962733

Real-World Used Cases

https://waymo.com/blog/2024/03/scaling-waymo-one-safely-across-four-cities-this-year/

Real-World Used Cases



https://www.anuflora.com/game/?author=8695
https://www.youtube.com/watch?v=qiyPBiLaDkU

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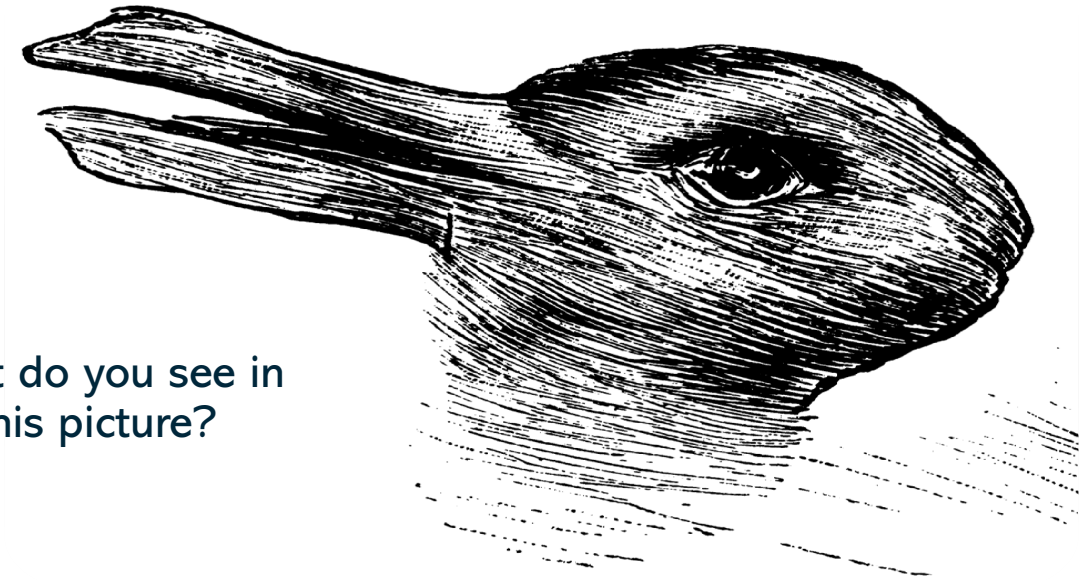
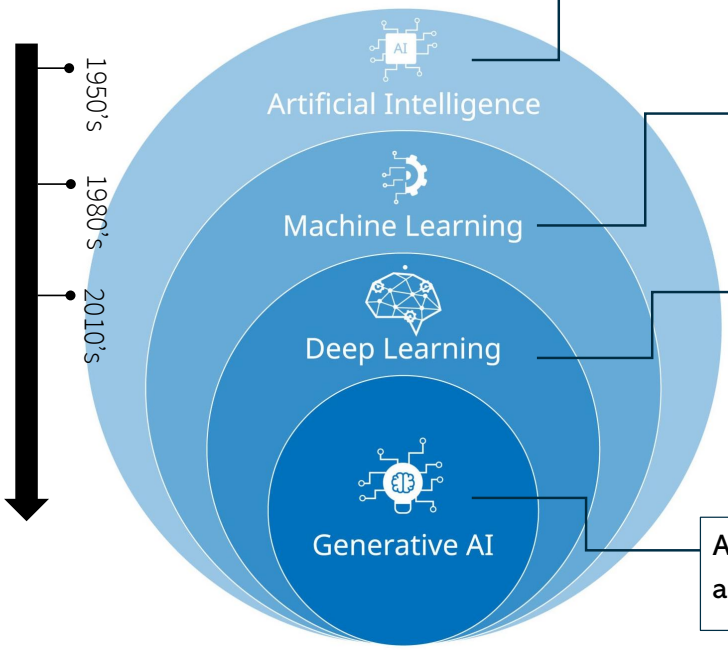
6. Next Class (^_^)/

Introduction to NN and DL



What do you see in this picture?

What is AI?



Making machines ***think*** and ***act*** like humans

Making machines ***learn from data*** *without* step-by-step instructions.

The machine builds its own "***brain***" (Artificial Neural Network model) by ***finding hidden patterns*** in the data.

AI that can ***generate new things***, not just analyze or classify.

Introduction to NN and DL

Deep learning for computer vision

Classification

https://www.freecodecamp.org/news/chihuahua-or-muffin-my-search-for-the-best-computer-vision-api-cbda4d6b425d/

Introduction to NN and DL

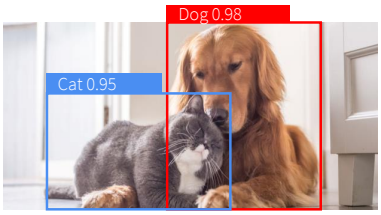
Deep learning for computer vision

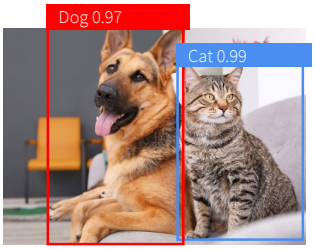
Classification

Cat

Dog

Object Detection





Segmentation

Introduction to NN and DL

Deep learning for computer vision

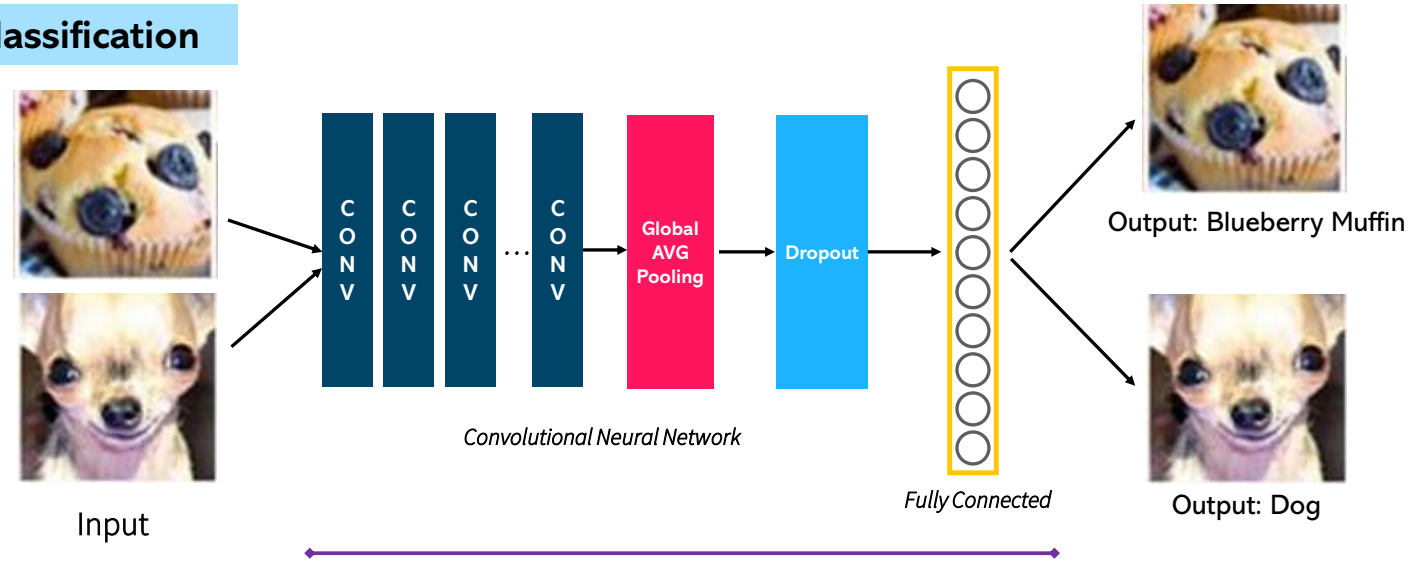
Classification

https://www.freecodecamp.org/news/chihuahua-or-muffin-my-search-for-the-best-computer-vision-api-cbda4d6b425d/

Introduction to NN and DL

Deep learning for computer vision

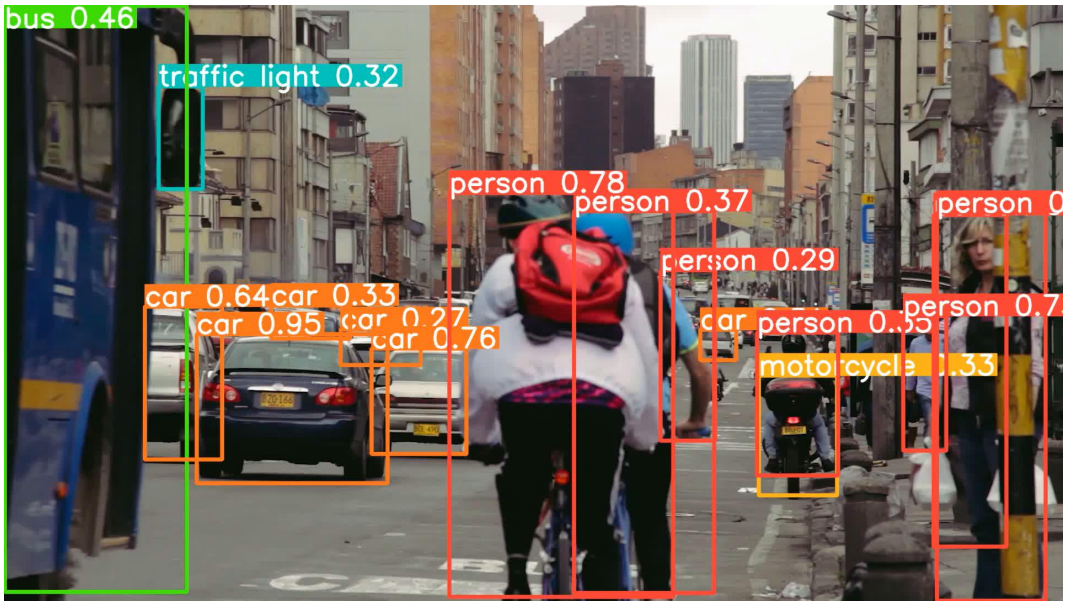
Classification



Introduction to NN and DL

Deep learning for computer vision

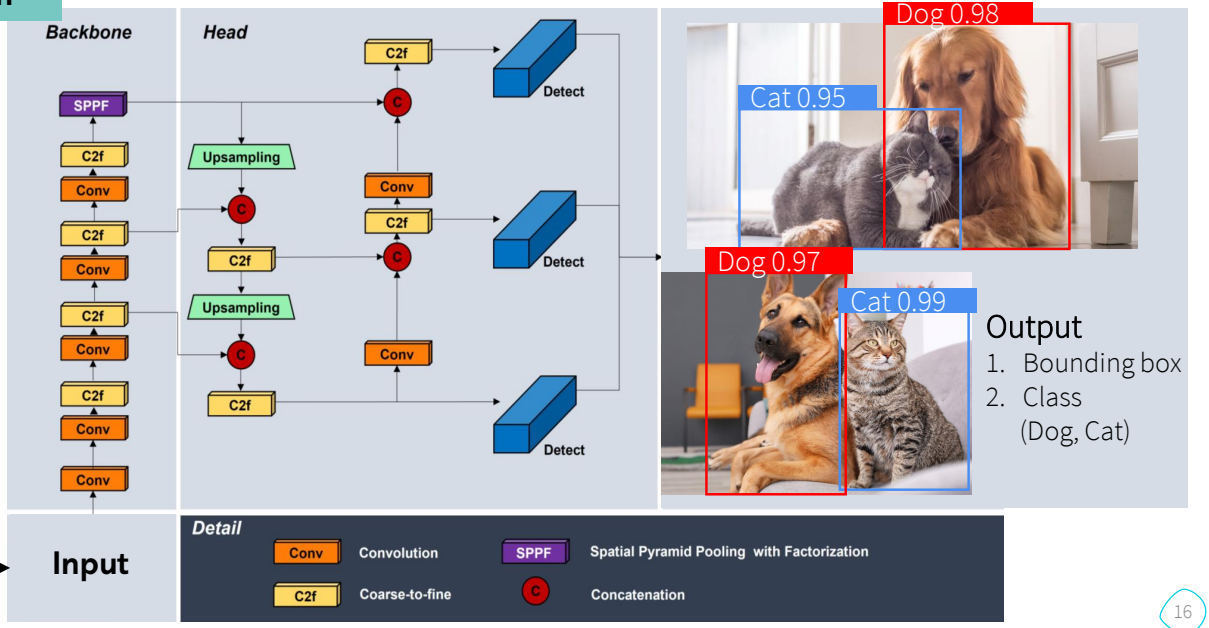
Object Detection



Introduction to NN and DL

Deep learning for computer vision

Object Detection



https://cats.com/how-to-get-a-dog-and-cat-to-bond

Deep Learning (Detection) model

Introduction to NN and DL

Deep learning for computer vision

Segmentation

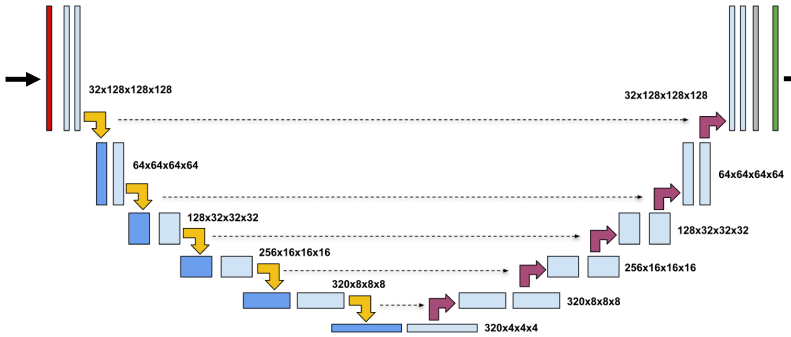
https://www.youtube.com/watch?v=ATlcEDSPWXY

Introduction to NN and DL

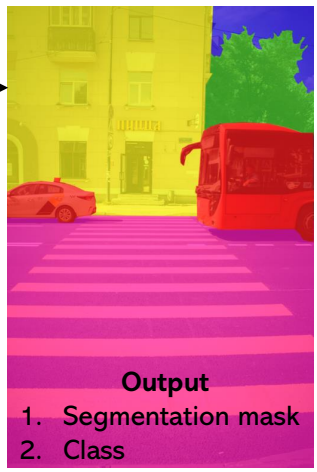
Deep learning for computer vision

Segmentation

Input



Deep Learning (Segmentation) model



Output

1. Segmentation mask
2. Class

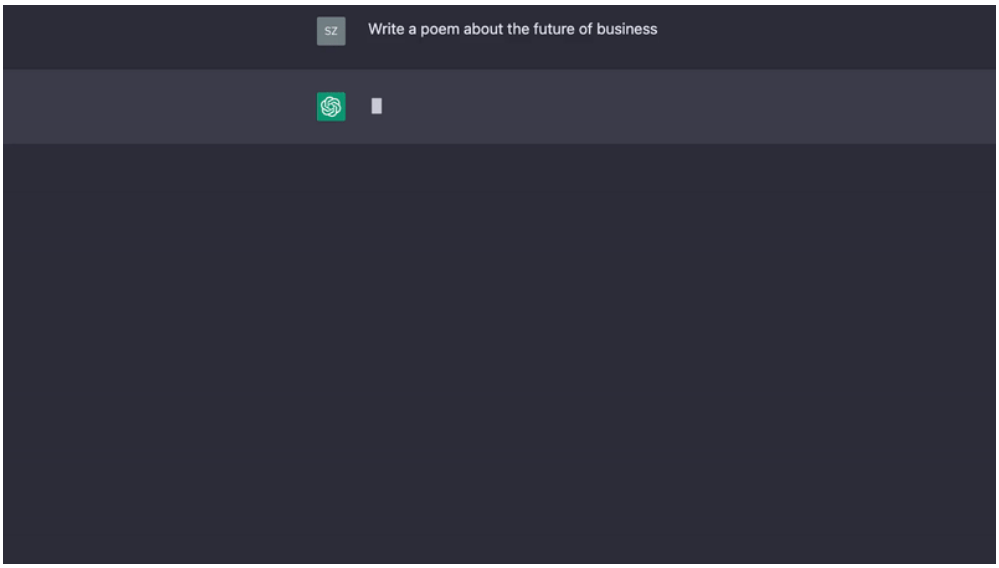
(Car, Building, Sky, Tree, Bus, Road)

Introduction to NN and DL

Generative AI

Large Language Model

Text to Text



https://bcghendersoninstitute.com/what-chatgpt-really-means-for-the-future-of-business/

Introduction to NN and DL

Generative AI

Large Language Model

Text to VDO

https://sora.chatgpt.com/explore

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Deep Learning Framework

TensorFlow

PyTorch

Deep Learning Framework

TensorFlow

```
[ ]
#TensorFlow
import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Conv2D, MaxPooling2D, Flatten, Dense

# Define the model
model_tf = Sequential([
    Conv2D(32, (3, 3), activation='relu', input_shape=(28, 28, 1)),
    MaxPooling2D((2, 2)),
    Flatten(),
    Dense(64, activation='relu'),
    Dense(10, activation='softmax')
])

# Compile the model
model_tf.compile(optimizer='adam',
                 loss='sparse_categorical_crossentropy',
                 metrics=['accuracy'])

# Model summary
model_tf.summary()

```

PyTorch

```
#Pytoch
import torch
import torch.nn as nn
import torch.nn.functional as F

# Define the model
class CNNModelPyTorch(nn.Module):
    def __init__(self):
        super(CNNModelPyTorch, self).__init__()
        self.conv1 = nn.Conv2d(1, 32, 3)
        self.pool = nn.MaxPool2d(2, 2)
        self.fc1 = nn.Linear(32 * 13 * 13, 64)
        self.fc2 = nn.Linear(64, 10)

    def forward(self, x):
        x = self.pool(F.relu(self.conv1(x)))
        x = x.view(-1, 32 * 13 * 13)
        x = F.relu(self.fc1(x))
        x = self.fc2(x)
        return x

# Create the model
model_pytorch = CNNModelPyTorch()

# Print model
print(model_pytorch)

```

Tool for write and execute python

https://colab.google/

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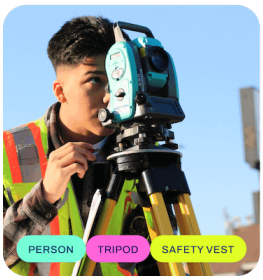
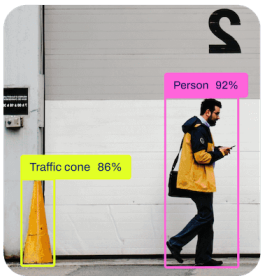
Playground
Gentle Lab {Just RUN!}

ultralytics
YOLO11

Classify

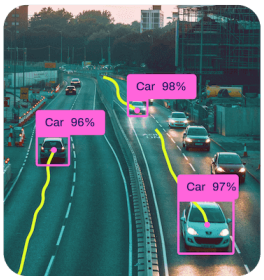


Detect

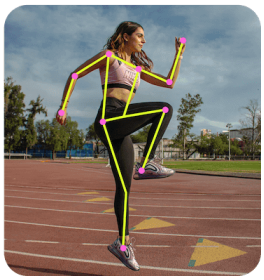


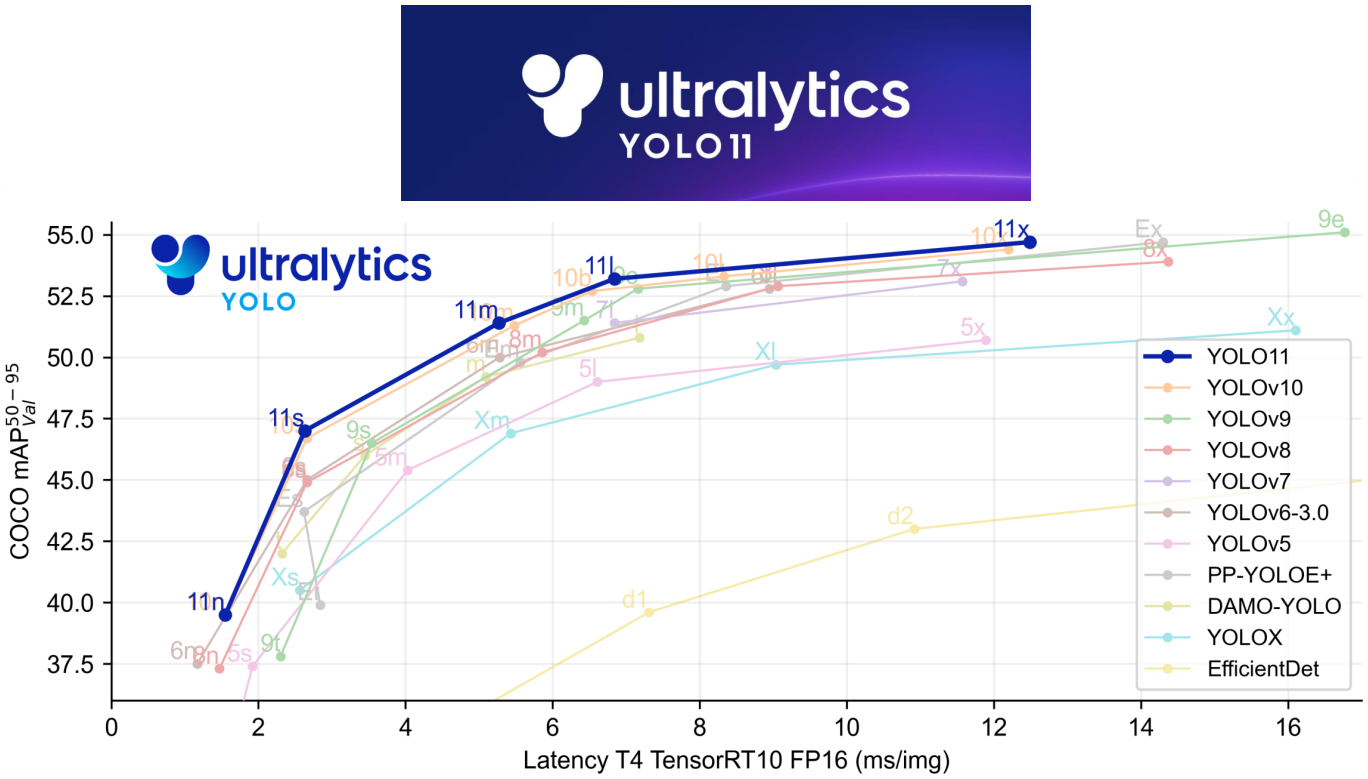
Segment

Track



Pose




ultralytics
YOLO11
ultralytics
YOLO
COCO mAP$^{50-95}_{val}$
Latency T4 TensorRT10 FP16 (ms/img)
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
0
2
4
6
8
10
12
14
16
YOLO11
YOLOv10
YOLOv9
YOLOv8
YOLOv7
YOLOv6-3.0
YOLOv5
PP-YOLOE+
DAMO-YOLO
YOLOX
EfficientDet

Playground
Gentle Lab {Just RUN!}

Link for Colab Notebook #1
Name: NN_DL_Lab1_18Nov2025_Yolov11.ipynb

https://colab.research.google.com/drive/11RmYTzts11VQ6ZgEf7cTp5DpXhpHiY4V?usp=sharing

Recap Keyword

Artificial Intelligence (AL)

Machine Learning (ML)

Deep Learning (DL)

Classification

Object Detection

Segmentation

Generative AI

Large Language Model

TensorFlow

PyTorch

ultralytics YOLO11

Google Colab

Well Done!

https://sora.chatgpt.com/p/s_69135b22fda48191b0cdc533a2149a1b