



AI

# 《初识计算机视觉》

静安区 上海大学市北附属中学 毛程毅

2019年10月22日



**SHE  
OR HE !?**





计算机视觉  
(CV)

# 人工智能 (AI)

人工智能分为强人工智能 (AGI, 通用人工智能) 与弱人工智能 (Applied AI, 应用人工智能)。

弱人工智能包含计算机视觉、语言识别、自然语言理解、推荐系统与专家系统。

# 计算机视觉 (CV)

即用机器代替人眼“看”，使用摄影机和计算机代替人眼对目标进行识别、追踪和测量，并进一步进行图像处理，使图像更适合人眼观察或仪器检测的科学，帮助人们更好地从图像或多维数据中获得有价值的信息。



2018 世界人工智能大会

WORLD ARTIFICIAL INTELLIGENCE CONFERENCE

关键字：**机器、学习、计算、数据**

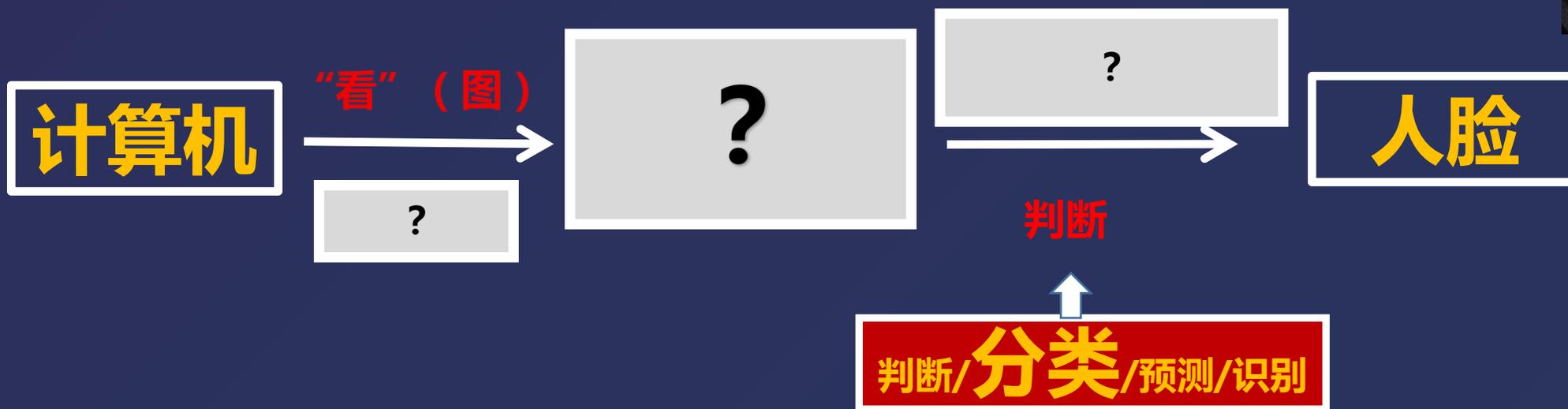
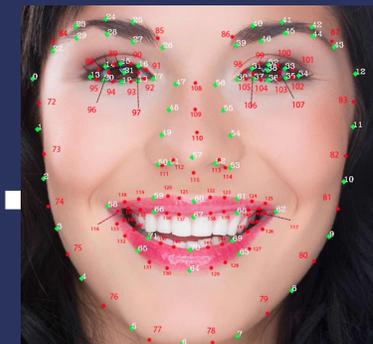
## 机器学习 (ML)

**机器学习**是实现**人工智能**的途径之一，即赋予机器学习的能力，其本质是一种通过**数据**的**计算**，**训练**出**模型**，然后使用模型，进行**预测**的一种方法。



计算机视觉(Computer Vision) = 图像处理(Image Processing)+机器学习(Machine Learning)

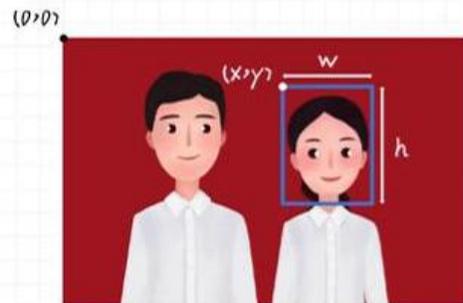
**机器学习**其本质是是一种通过**数据**的**计算**，**训练**出**模型**，然后使用模型，进行**预测**的一种方法。



# 体验任务1：人脸检测

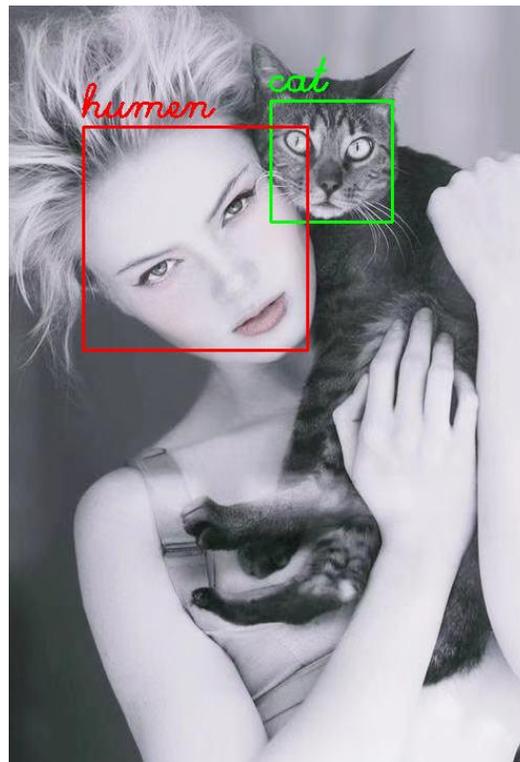
工具：python扩展库，open-cv

扩展库的安装：pip install numpy; pip install matplotlib; pip install opencv-python

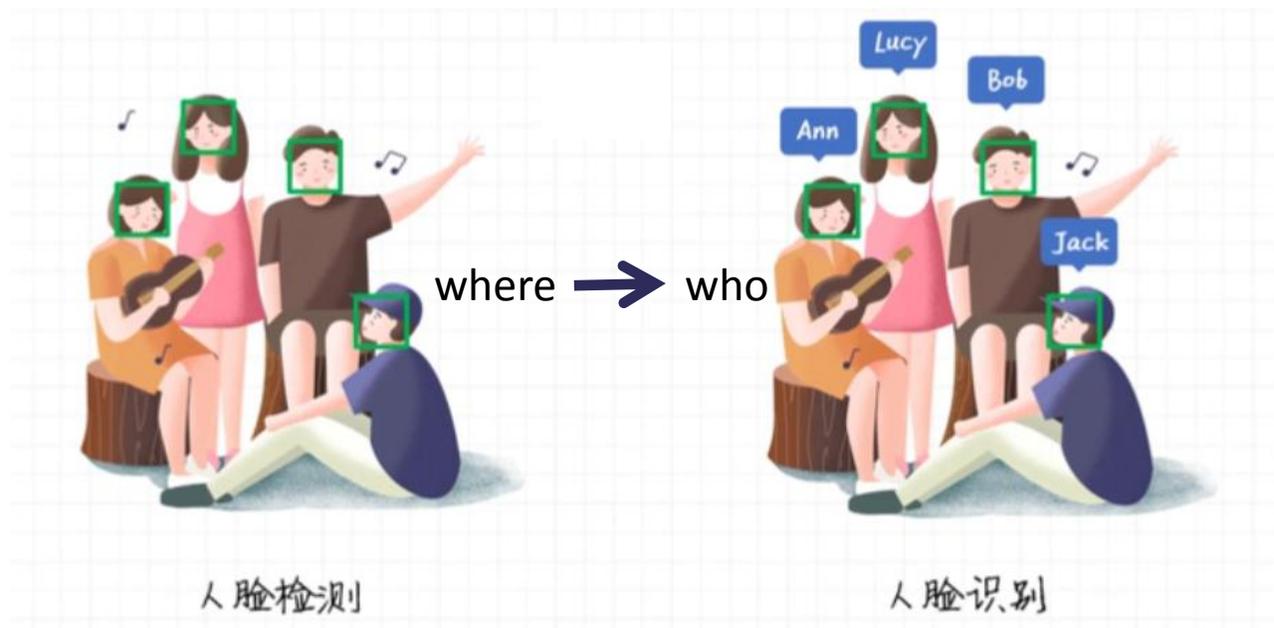


numpy.ndarray类型(多维数组类型), [[x,y,w,h]]

## 体验任务2：猫脸检测



# 人脸识别



计算机

“看”（脸）  
提取

特征值

“谁”的模型  
识别

谁

请说说人脸识别  
在生活中的应用





```
demo.py - C:\Users\Administrator\Desktop\demo.py (3.6.8)
File Edit Format Run Options Window Help

import face_recognition
import cv2
import numpy as np

# This is a demo of running face recognition on live video from your webcam. It'
# other example, but it includes some basic performance tweaks to make things ru
# 1. Process each video frame at 1/4 resolution (though still display it at fu
# 2. Only detect faces in every other frame of video.

# PLEASE NOTE: This example requires OpenCV (the `cv2` library) to be installed
# OpenCV is *not* required to use the face_recognition library. It's only requir
# specific demo. If you have trouble installing it, try any of the other demos t

# Get a reference to webcam #0 (the default one)
video_capture = cv2.VideoCapture(0)

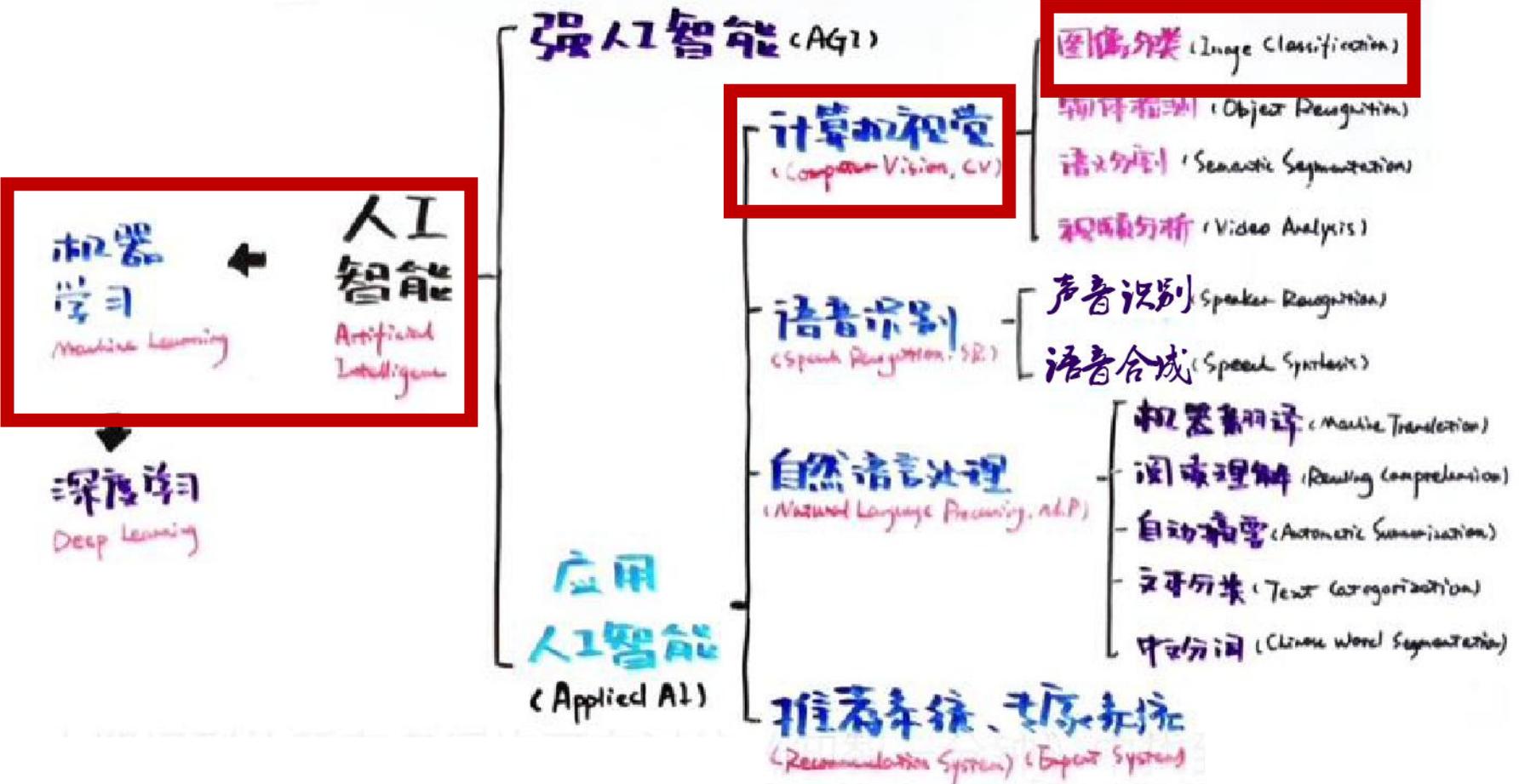
# Load a sample picture and learn how to recognize it.
obama_image = face_recognition.load_image_file("obama.jpg")
obama_face_encoding = face_recognition.face_encodings(obama_image)[0]

# Load a second sample picture and learn how to recognize it.
biden_image = face_recognition.load_image_file("maomao.jpg")
biden_face_encoding = face_recognition.face_encodings(biden_image)[0]

# Create arrays of known face encodings and their names
known_face_encodings = [
    obama_face_encoding,
    biden_face_encoding
]
known_face_names = [
    "Obama",
    "Mao"
]

# Initialize some variables
face_locations = []
face_encodings = []
face_names = []
process_this_frame = True

Ln: 1 Col: 0
```





# 《初识计算机视觉》

静安区 上海大学市北附属中学 毛程毅

2019年10月22日