



# 《初识计算机视觉》

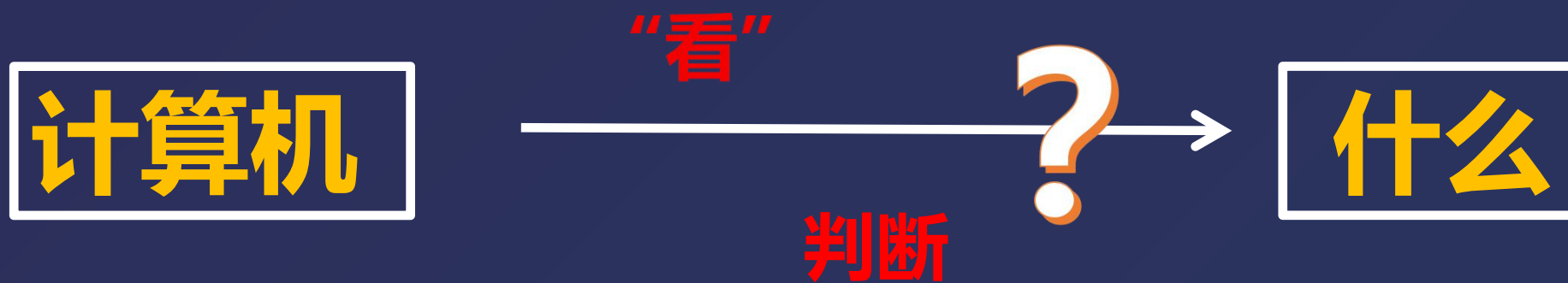
静安区 上海大学市北附属中学 毛程毅

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。



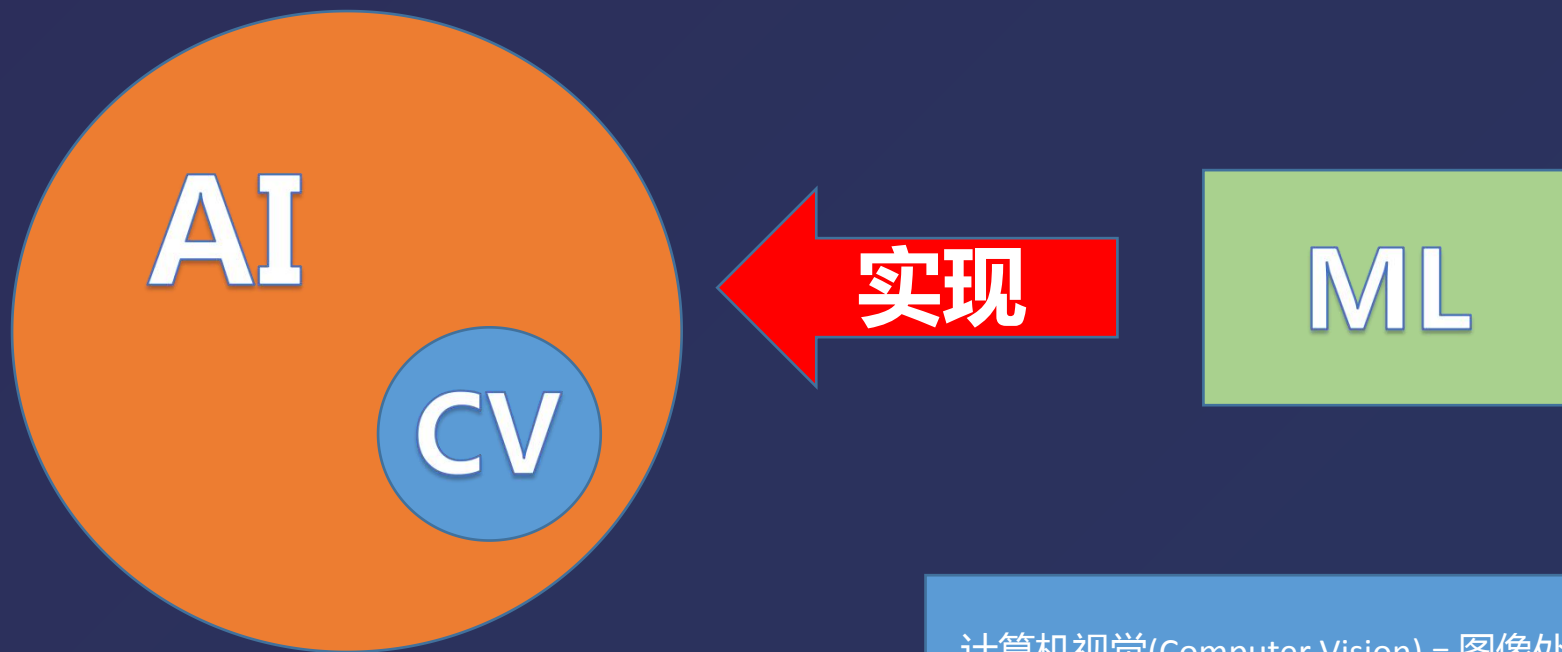
2018 世界人工智能大会

WORLD ARTIFICIAL INTELLIGENCE CONFERENCE

关键字：**机器、学习、计算、数据**

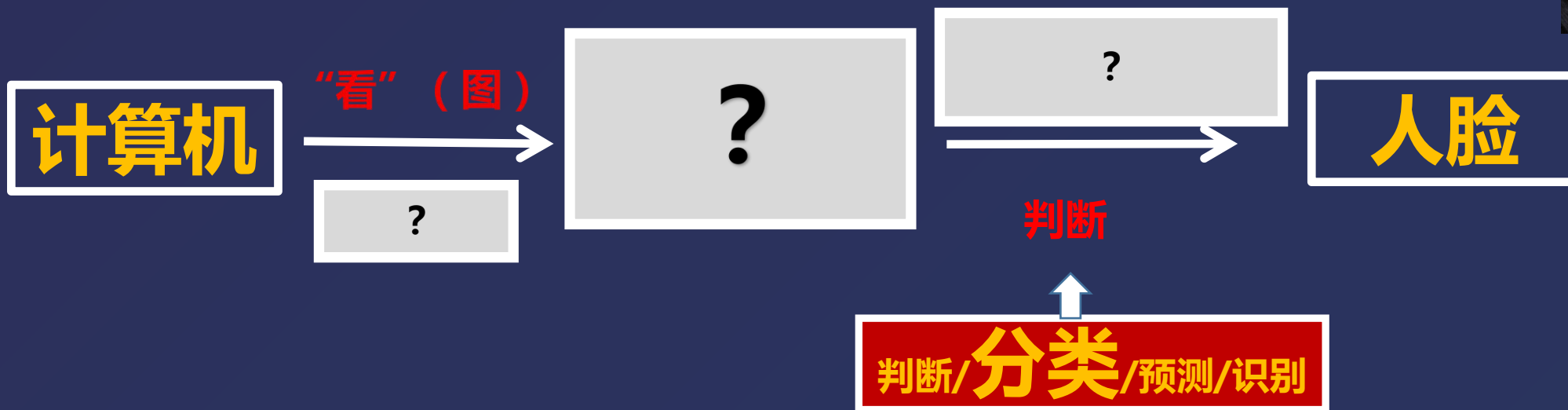
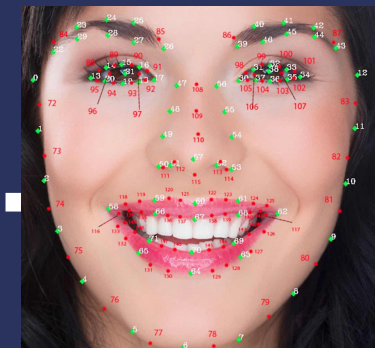
## 机器学习 (ML)

**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)

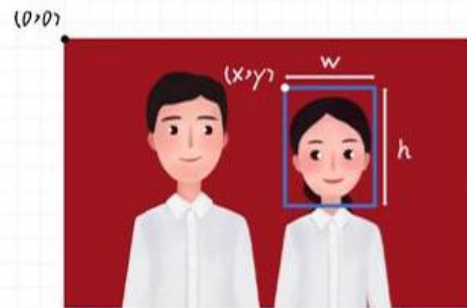
**机器学习**其本质是是一种通过**数据**的**计算**，**训练**出**模型**，然后使用模型，进行**预测**的一种方法。



# 体验任务1：人脸检测

工具：python扩展库，open-cv

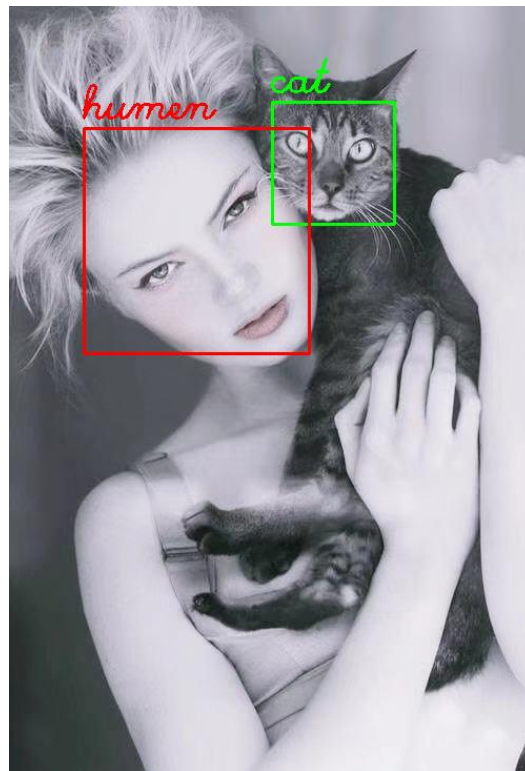
扩展库的安装：pip install numpy; pip install matplotlib; pip install opencv-python



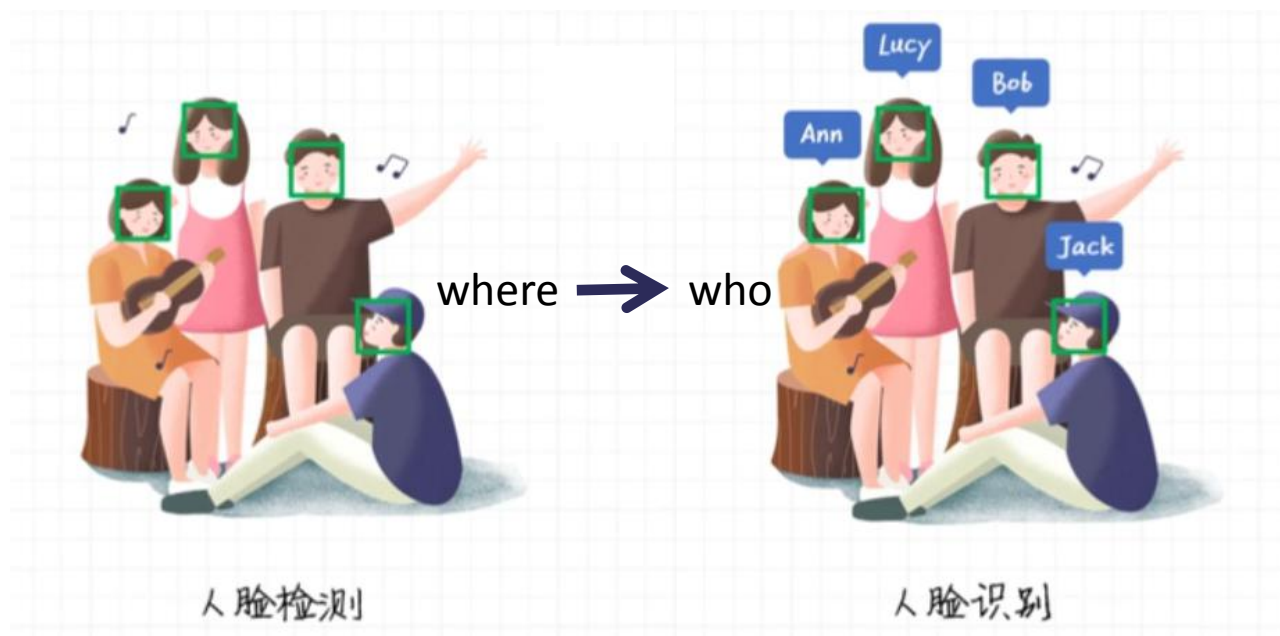
numpy.ndarray类型(多维数组类型), `[[x,y,w,h]]`



## 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]

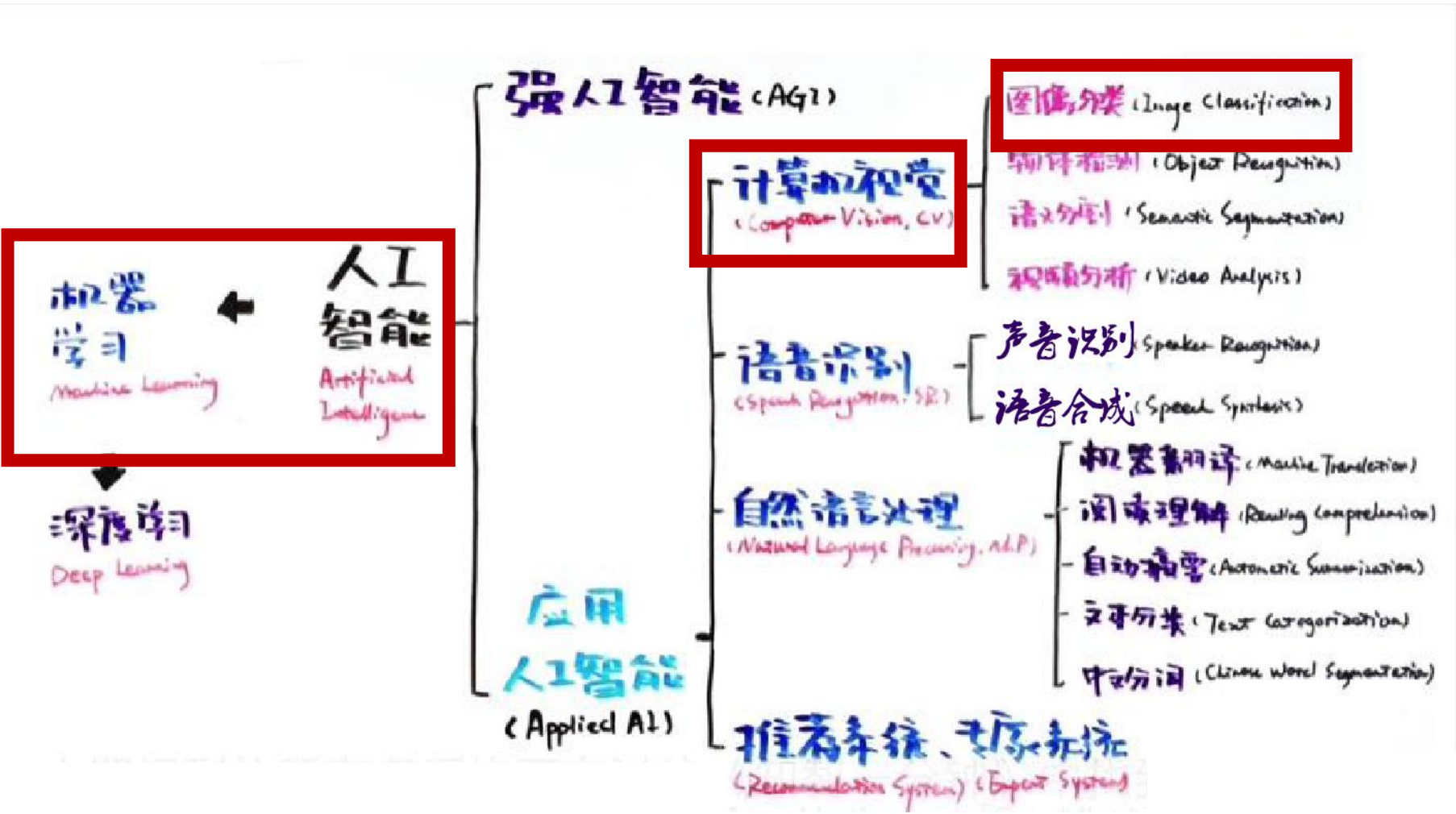
# Load a second sample picture and learn how to recognize it.
biden_image = face_recognition.load_image_file("maomao.jpg")
biden_face_encoding = face_recognition.face_encodings(biden_image)[0]

# 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
```





机器学习  
Machine Learning

人工智能  
Artificial Intelligence

深度学习  
Deep Learning

强人工智能 (AGI)

计算机视觉  
(Computer Vision, CV)

图像分类 (Image Classification)

物体检测 (Object Recognition)

语义分割 (Semantic Segmentation)

视频分析 (Video Analysis)

语音识别  
(Speech Recognition, SR)

声音识别 (Speaker Recognition)

语音合成 (Speech Synthesis)

自然语言处理  
(Natural Language Processing, NLP)

机器翻译 (Machine Translation)

阅读理解 (Reading Comprehension)

自动摘要 (Automatic Summarization)

文本分类 (Text Categorization)

中文分词 (Chinese Word Segmentation)

应用  
人工智能  
(Applied AI)

推荐系统、专家系统  
(Recommendation System) (Expert System)





AI

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