

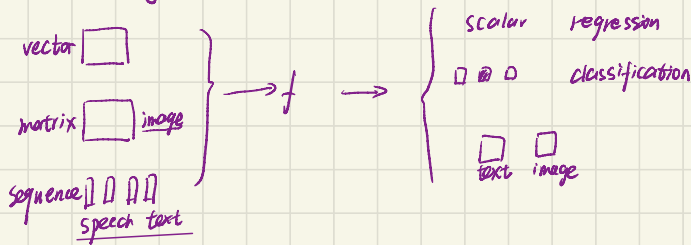


① 机器学习  $\rightarrow$  找一个函数

例: speech recognition:  $f(c) = \dots$

Image recognition:  $f(image) = \dots$

## ② Deep learning



## ③ 机器找 function

supervised learning: 搜集资料  $\rightarrow$  labels  $\rightarrow$  找 function

self-supervised learning: pre-train  $\rightarrow$  下游任务中取得好的结果  
 $\downarrow$   
(foundation model)  
develop general purpose knowledge (unlabeled images)

Generative Adversarial network:  $X \rightarrow$  function  $\rightarrow Y$

收集大量  $X, Y$ , 不需要  $X, Y$  间的关系. function 可判识

Reinforcement learning (RL): when challenging to label data hard. We can know the results are good or not.  $\rightarrow$  RL.

Anomaly Detection 异常检测

Explainable AI: why know? 可解释性 AI

Model Attack: 模型攻击: 比如在一张图片加入干扰因素, 机器学习会得出不同的结果

Domain Adaptation: 迁移学习

Network Compression: 模型压缩

life-long learning: 终身学习

Meta-learning:  $\square \rightarrow$  learning Algorithm  $\rightarrow \square$

$\downarrow$   
自己发明算法, 不需要手写算法

看一两个 example 学会任务

few-shot learning is usually achieved by meta-learning.