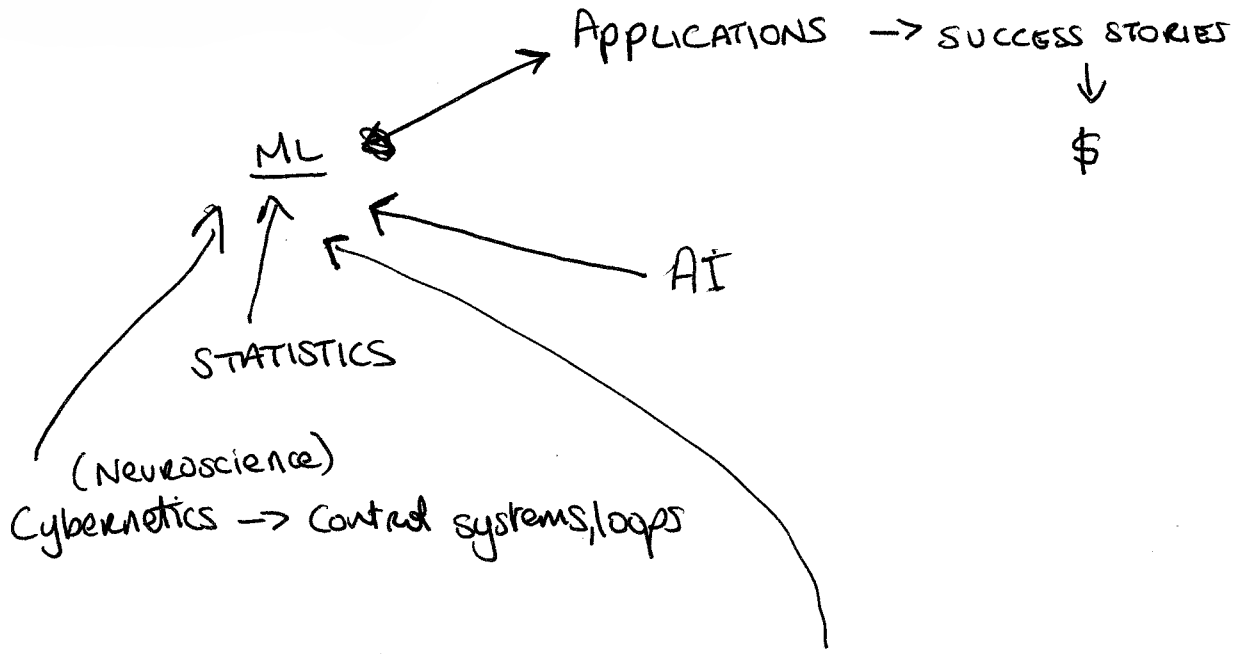


LECTURES FROM 20th & 21st SEPTEMBER

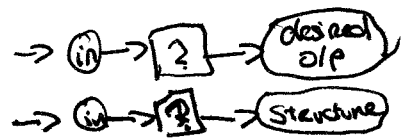


SCRUFFIES →
 VS
 NEATS
 ↓ entropy

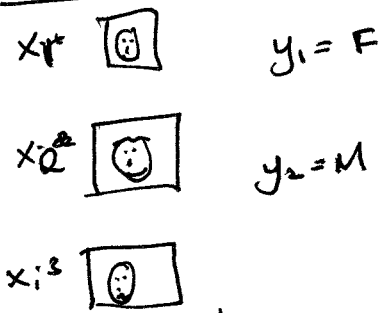
- increases in data
- computing power
 - storage
 - cycles (streaming)

CLASSES OF ML ALGORITHMS

- Supervised (regression/classification)
- Unsupervised (figure out structure)
- Reinforcement learning (agent)

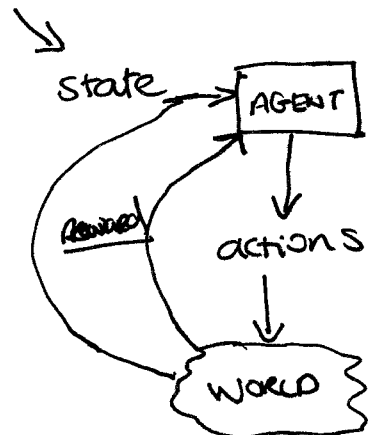


EXAMPLE



find w $x_i \xrightarrow{f(w)} y_i$

$$\min \sum_{i=1}^n |f(x_i; w) - y_i|$$

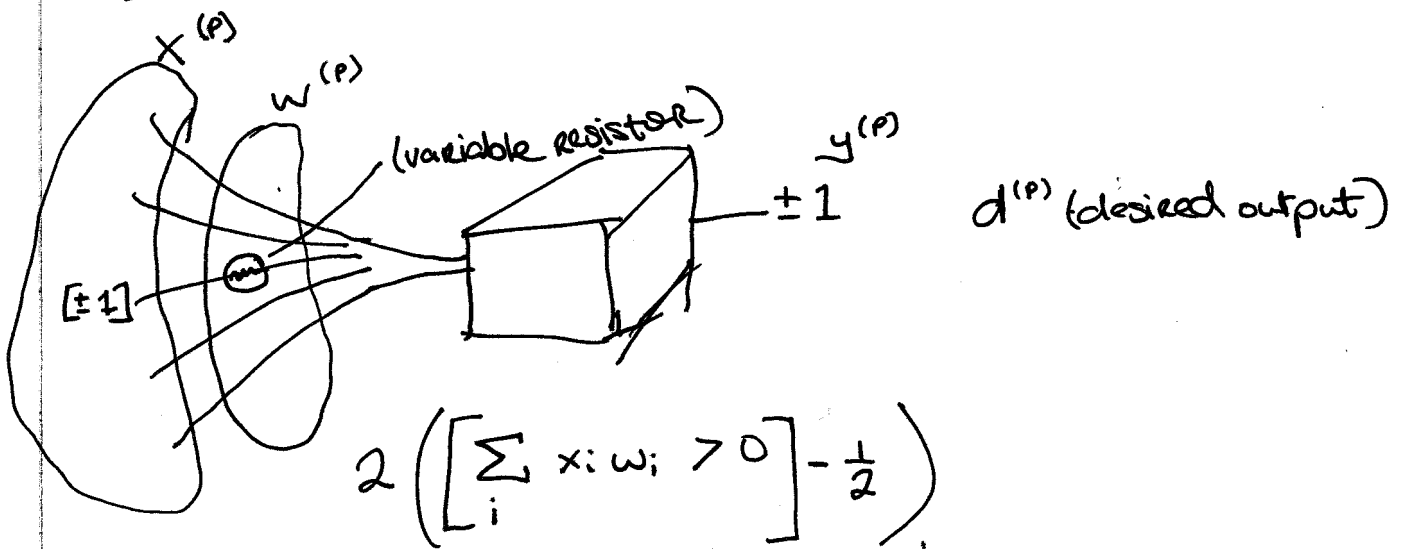


[reward is related to sequence of actions]

- 1) Quizzes
- 2) Projects
 - R (canned routines)
 - Matlab, Java...

R-project.org

PERCEPTRON



loop

get input x
 calc. $y = f(x; w)$

$\Delta = \underbrace{y - d}_{\text{error}}$

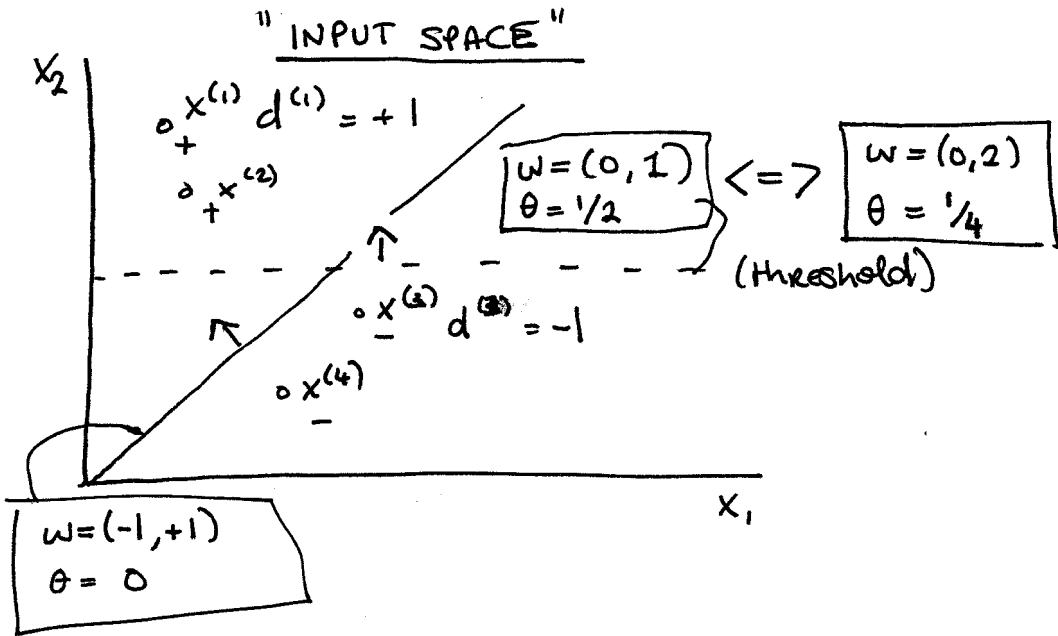
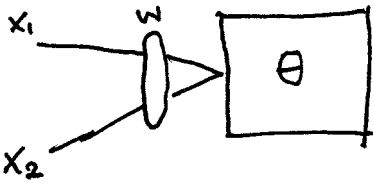
\forall_i

$w_i \leftarrow w_i + \eta \Delta x_i$
 $\theta \leftarrow \theta + \eta \Delta$

small number

PLR
 (Perceptron Learning Rule)

$f(x; w) = \begin{cases} +1 & \text{if } \sum_i w_i x_i > \theta \text{ (threshold)} \\ -1 & \text{else} \end{cases}$

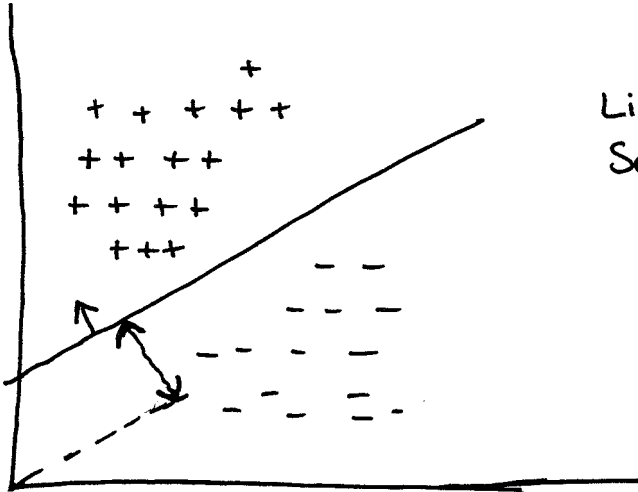


EXAMPLE:

$$w \cdot x = \theta$$

$$w_1 x_1 + w_2 x_2 = \theta$$

$$x_2 = \frac{\theta - w_1 x_1}{w_2}$$



Linearly
Separated

