L#GEEK

An overview on Machine & Deep Learning

Zakaria El bazi


1945
Alan Turing


1997
Man Vs Machine
GARRY
KASPAROV
DEEP
BLUE


2018
Sophia *


Google DeepMind
OpenAI
Man Vs Machine
LEAGUE OF LEGENDS
STARCRAFT

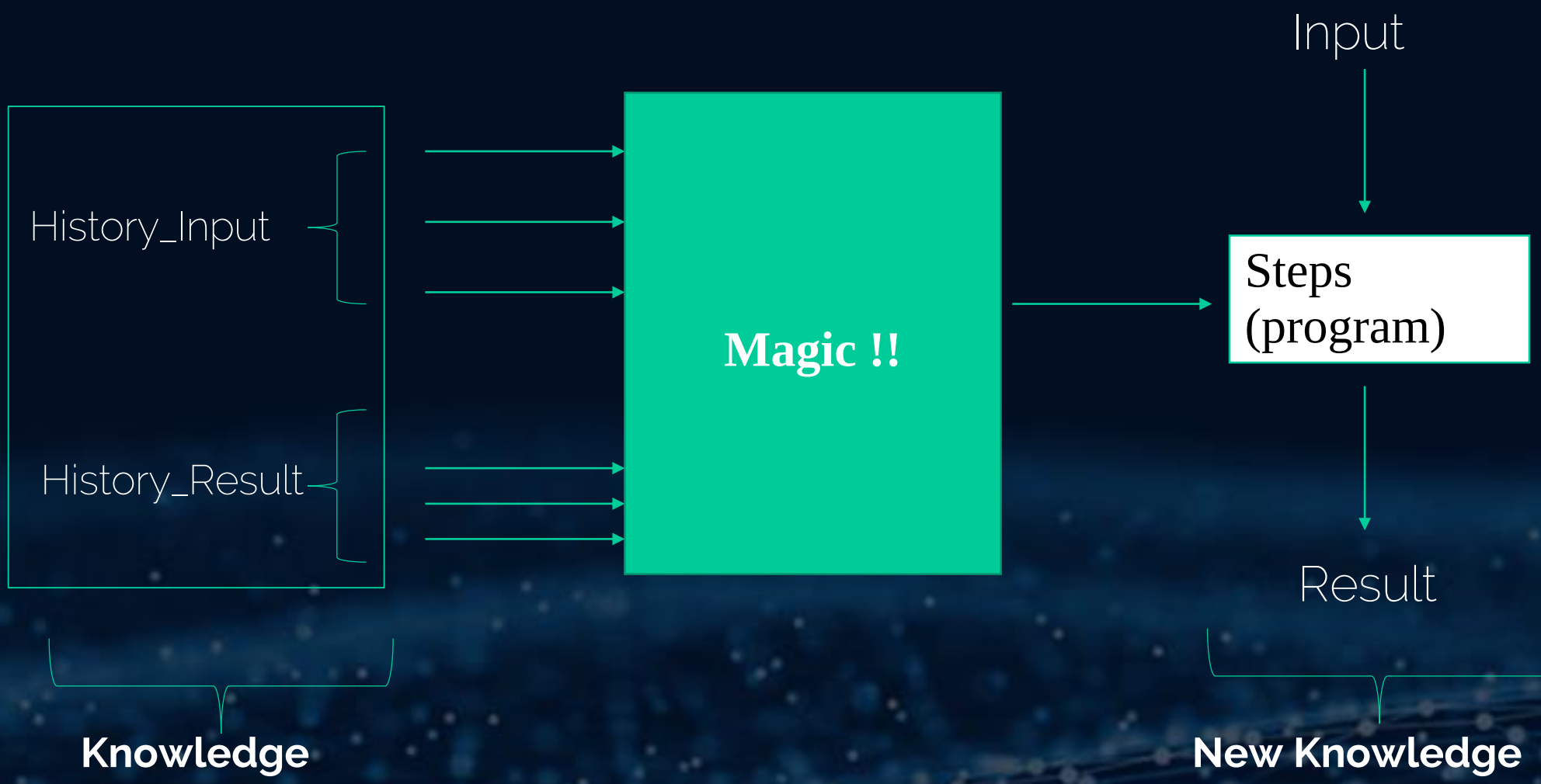
Intelligent Assistants

Classical Programming

Artificial Intelligence _ AI

- Artificial Intelligence (AI) is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with **intelligent beings** that can adapt to changing circumstances in their environment which means giving machines the ability to learn from experience , adjust to new inputs and perform human-like tasks .
    - **Symbolic AI** : knowledge could be obtained by operating on symbols (signs that stand for a certain meaning or event) and deriving rules from them
    - **Connectionist AI**: simulating biological neurons and using them to solve some specific problems(Deep learning)
    - **Statistical AI**: using statistical methods to extract hidden patterns in the data (Machine Learning) …

AI


Input
History_Input
History_Result
Magic !!
Steps
(program)
Result
Knowledge
New Knowledge

Why_ AI ?

- Develop systems that can automatically adapt to users/contexts.
- Discover new knowledge from data (insights).
- Develop systems that can automatically adapt to users/contexts
- Mimic human mind to replace some repetitive tasks that requires intelligences (object recognition,…).
- Develop systems that can automatically adapt to users/contexts
- Develop complex systems that needs some “expert level” knowledge to construct manually .
- High accuracy in doing some specific task (image processing ,voice recognition).

fils(brahim,idir).

fils(jawad,idir).

fils(Youssef,brahim).

fils(Youssef,brahim).

femme(aicha).

homme(youssef).

homme(idir).

homme(jawad).

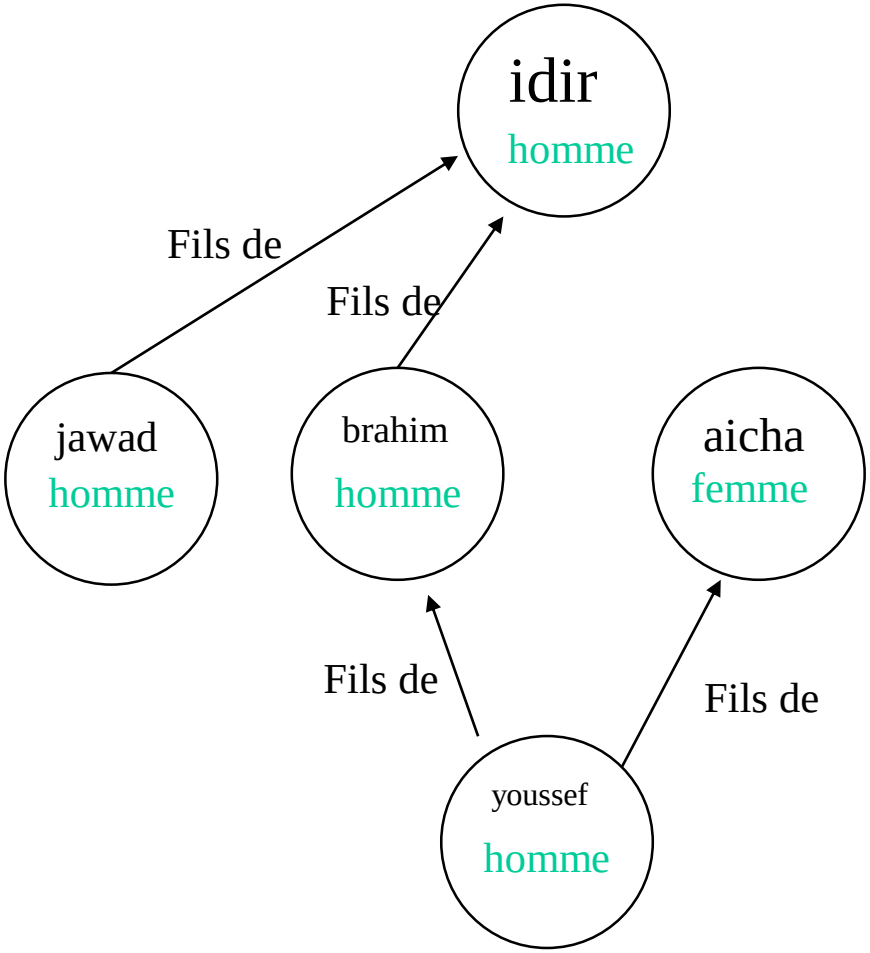
homme(brahim).

antecedant(Y,X) :- fils(X,Y).

pere(Y,X) :- fils(X,Y), homme(Y).

mere(Y,X) :- fils(X,Y), femme(Y).

grand_father(X,Z) :- father(X,Y), antecedant(Y,Z).



Natural Language processing _PROLOG

Branch: master ▾ prolog / NLPF.pl Find file Copy path

Z4ck404 Update NLPF.pl c1c4ae5 on May 13, 2018

1 contributor

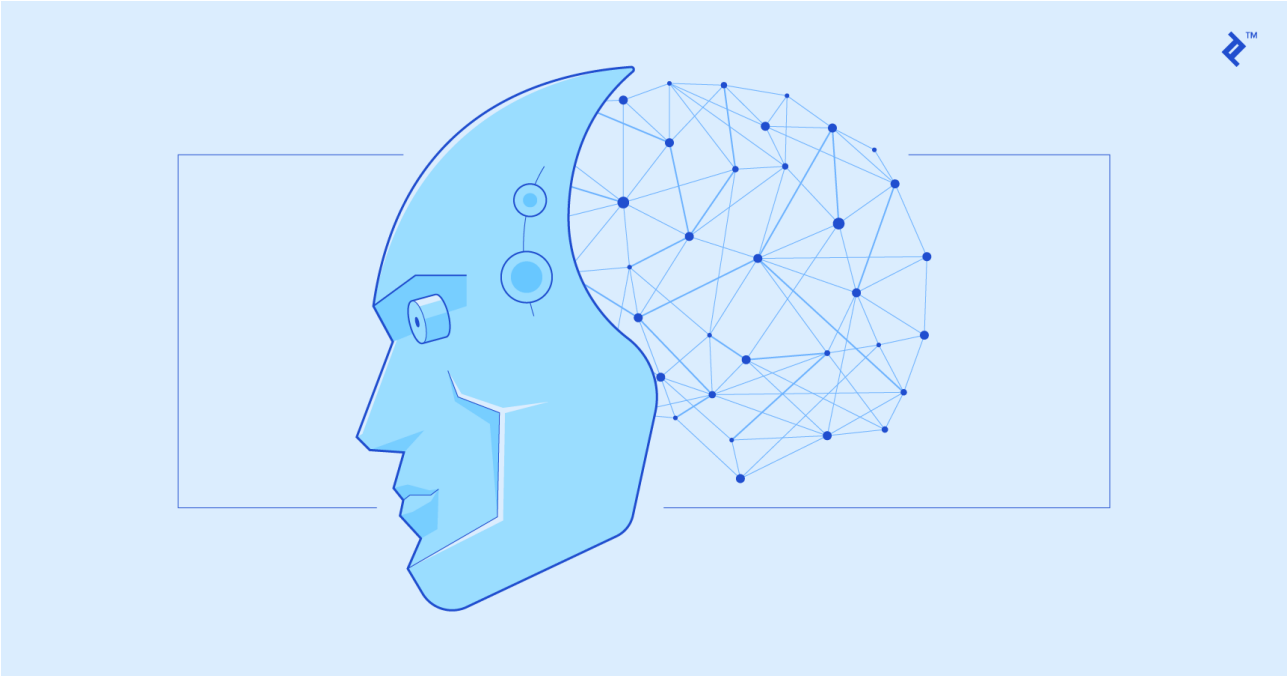
59 lines (47 sloc) 2.38 KB Raw Blame History

```
%ce programme prolog recoaanit la structure languistique d'une phrase
%et corrige aussi les fautes d'orthographe.
%La grammaire que les phrases doivent respectées :
ph(P,R,_,_):-gn(P,S,_,_),gv(S,R,_,_).
ph([],[],_,_).
%le groupe nominal :
gn(P,S,G,N):-sn(P,S,G,N).
gn(P,S,G,N):-pps(P,S,G,N).%pps : prenon personnel sujet
%G pour le genre , N pour le nombre .
pps([P|S],S,G,N):-member(P,["je","tu","il"]),G=m,N=s,write(pren_perso__).
pps([P|S],S,G,N):-member(P,["je","tu","elle"]),G=f,N=s,write(pren_perso__).
pps([P|S],S,G,N):-member(P,["nous","vous","ils"]),G=m,N=p,write(pren_perso__).
%syntagme_nominal :
sn(P,S,_,_):-det(P,R1,G,N),adjs(R1,R2,G,N),nom(R2,R3,G,N),adjs(R3,R4,G,N),cnom(R4,S,G,N).
nom([R|S],S,G,N):-member(R,["ali","jawad","steve","chat"]),G=m,N=s,write(nom__).
nom([R|S],S,G,N):-member(R,["hajar","pomme","table"]),G=f,N=s,write(nom__).
gv(P,S,_,_):-verbeetat(P,R1,_,_),attribut(R1,R2,_,_),ccir(R2,S,_,_).
gv(P,S,G1,N1):-verbe(P,R1,G1,N1),cod(R1,R2,_,_),coi(R2,R3,_,_),ccir(R3,S,_,_).
verbe([P|R],R,m,s):-member(P,["mange","prend"]),write(verbe__).
verbeetat([V|R],R,m,s):-member(V,["suis","es","est"]),write(verbe_etat__).
verbeetat([V|R],R,m,p):-member(V,["sommes","etes","sont"]),write(verbe_etat__).
```

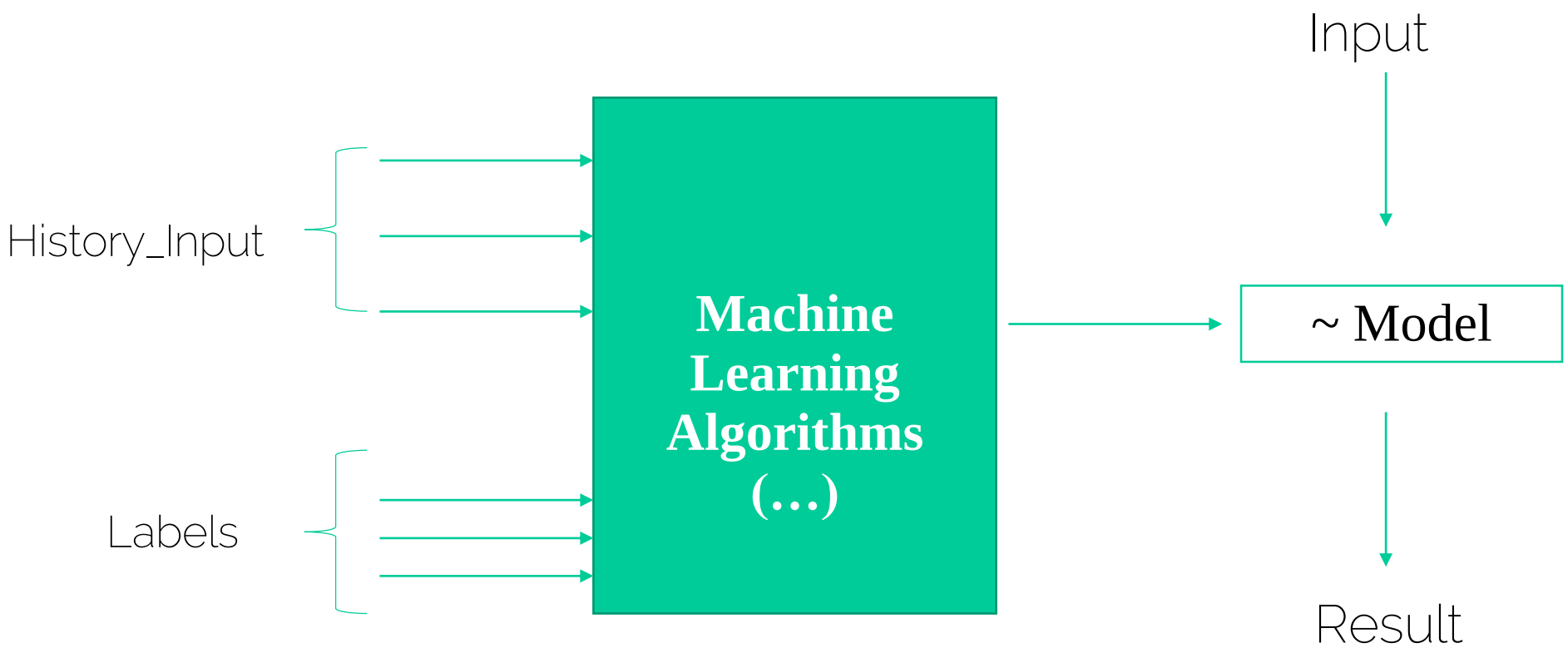
Statistical _AI

- Machine Learning (Apprentissage Automatique)

  Set of methods that gives “computers the ability to learn without being explicitly programmed” by discovering and formalizing the principals that underlie the data it sees.



Machine Learning



Machine Learning

Supervised Learning

Labels we are trying to predict are known
predicting label y based on features x
Y = f(x) where f is the model

Unsupervised Learning

Labels we are trying to predict are not known
-Separating input data based on feature x into different communities but we dont know exactly the label y ,

Machine Learning

- Supervised Learning -

Example : Spam filtering (scams , unwanted emails , ….)

Input : features (X)

Label Y

Number of new Recipients	Email Length (K)	Country (IP)	Customer Type	Email Type
0	2	Germany	Gold	Ham
1	4	Germany	Silver	Ham
5	2	Nigeria	Bronze	Spam
2	4	Russia	Bronze	Spam
3	4	Germany	Bronze	Ham
0	1	USA	Silver	Ham
4	2	USA	Silver	Spam

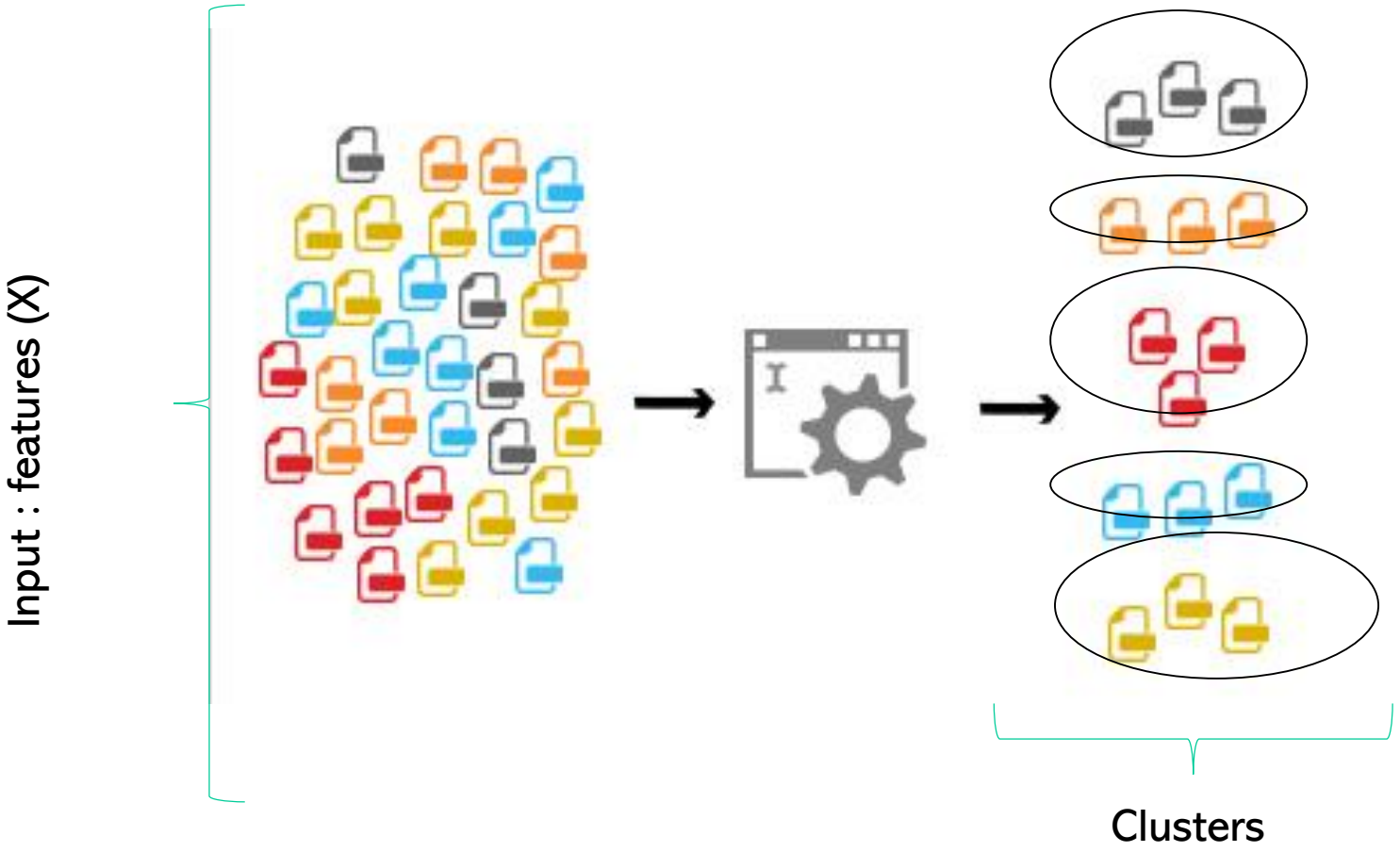
Ham or Spam ?

New input	2	3	Morocco	Gold

Machine Learning

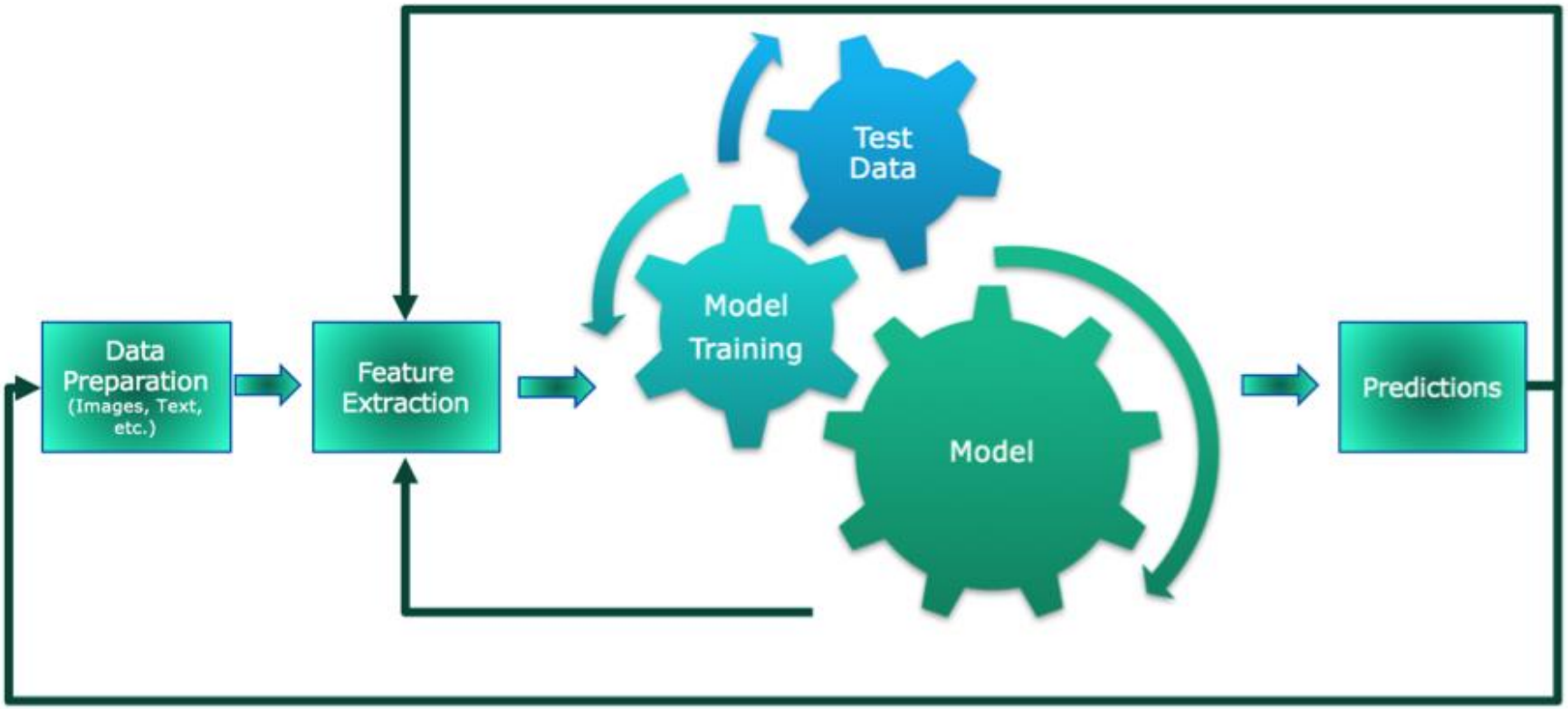
- Unsupervised Learning -

Example : Clustering



Machine Learning

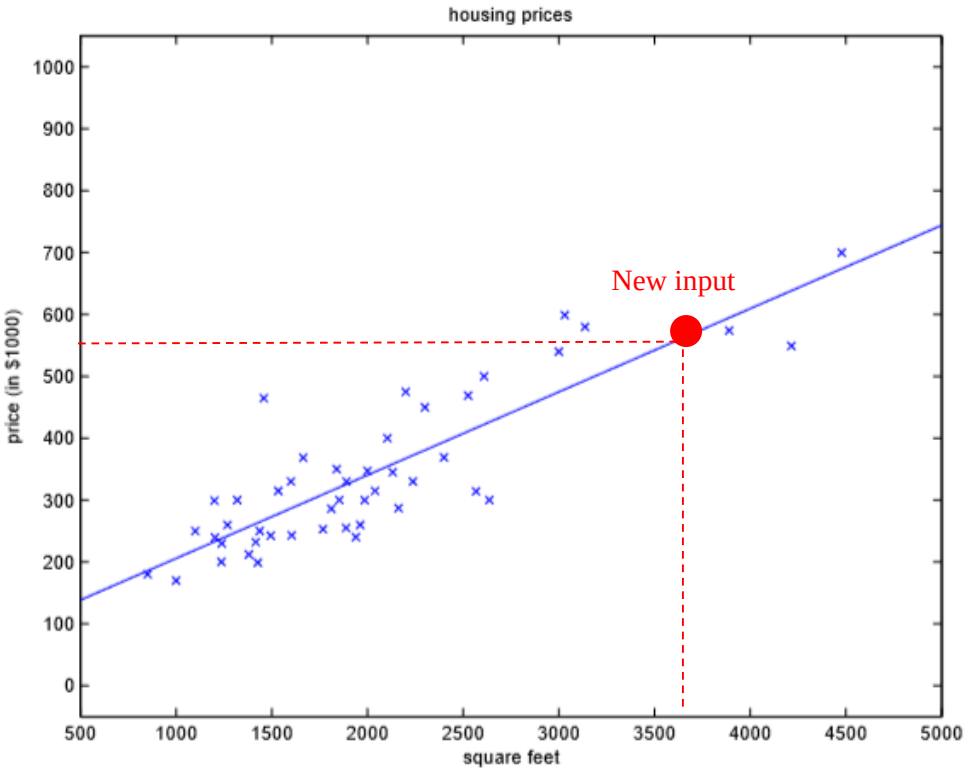
- Project life cycle : pipeline -



Machine Learning

- Learning algorithms -

Linear and multiple regression



The model :

$$h_\theta(x) = \theta_0 + \theta_1 x_1 + \theta_2 x_2$$

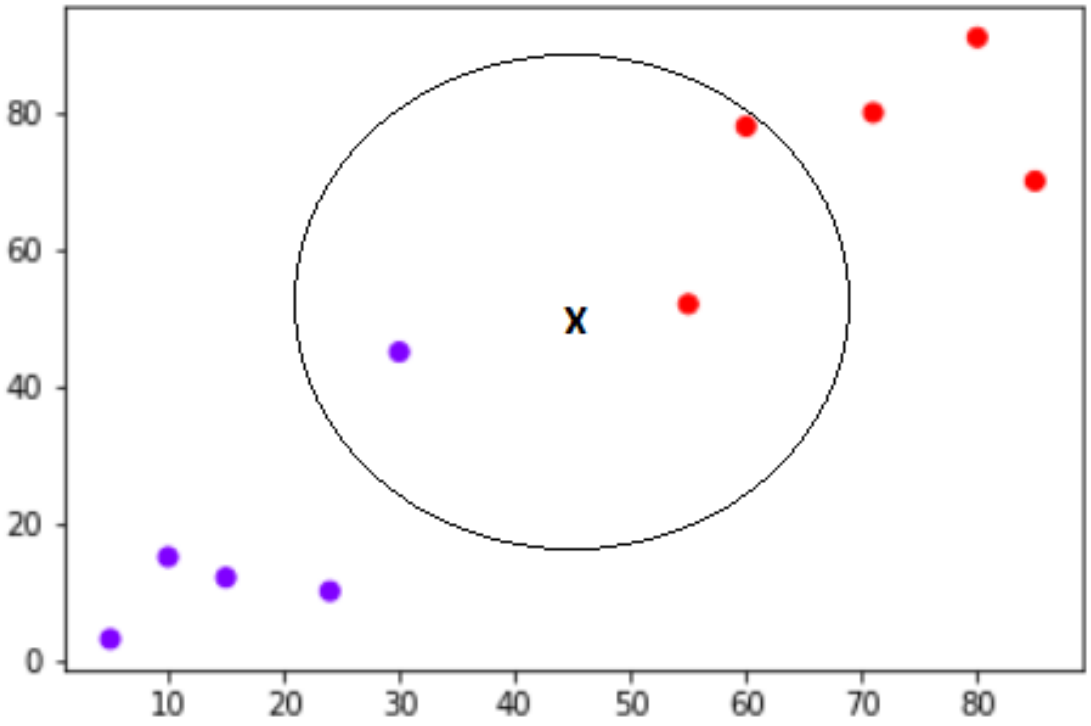
The problem : Finding « theta » !

We use algorithms like :

- Gradient decent .

Machine Learning
- Learning algorithms -

K-NN : The K nearest Neighbors



Bad

Good

The algorithm :
Assign to the new input the popular behavior among its neighbors

Machine Learning

- Learning algorithms –

github.com/z4ck404

Z4ck404 / **recommender-system**

Watch 0 | Star 0 | Fork 1

Code | Issues 0 | Pull requests 0 | Projects 0 | Wiki | Insights | Settings

Recommendation System Using K-Nearest Neighbors .

Edit

machine-learning | knn-classification | knn-algorithm | javascript | recommender-system | machine-learning-algorithms | knearest-neighbors | Manage topics

12 commits | 1 branch | 0 releases | 1 contributor

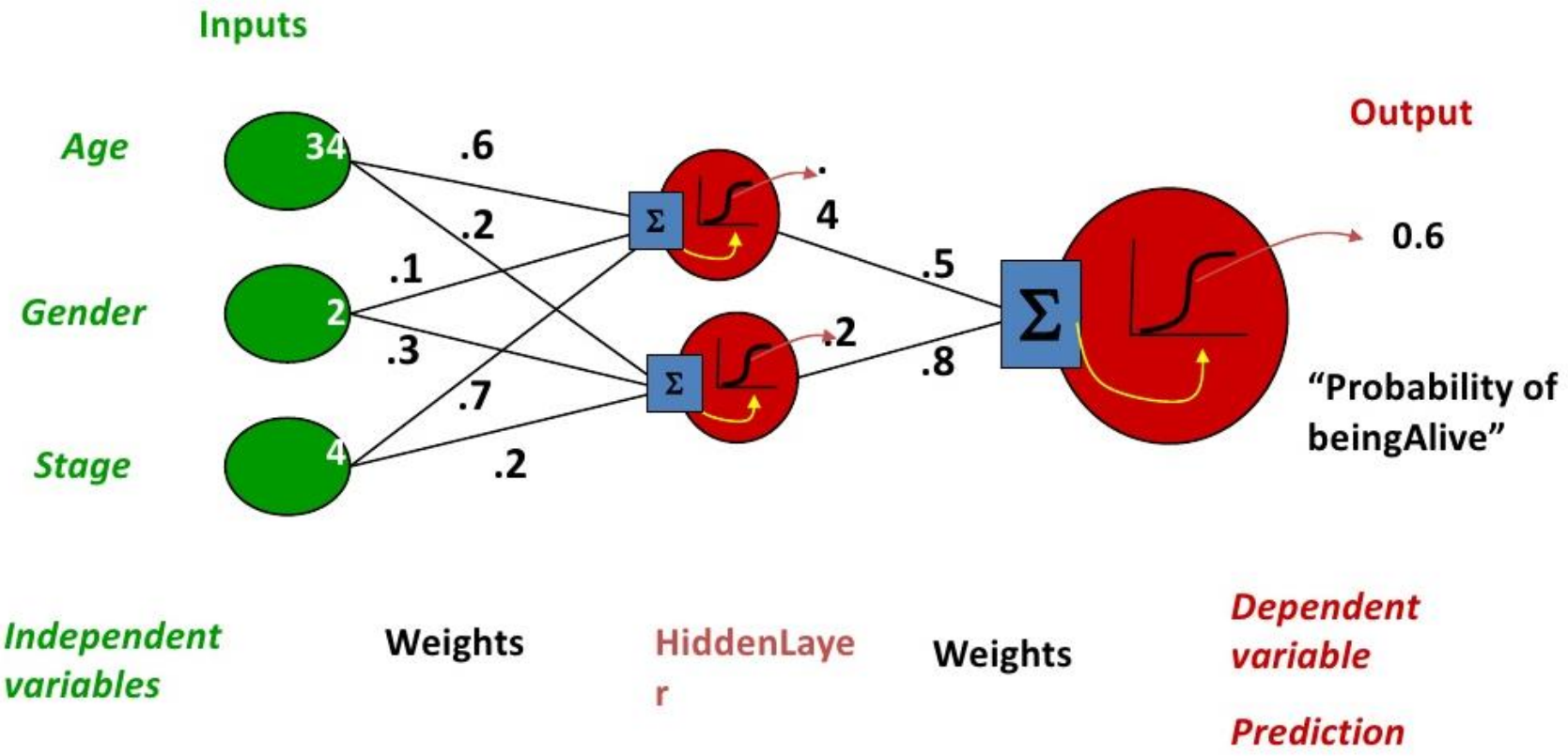
Branch: master | New pull request | Create new file | Upload files | Find file | Clone or download

Z4ck404 Update README.md — Latest commit 68beee2 on Oct 11, 2018

KNN_Recommender.js	updated version that can be executed via cmd	4 months ago
README.md	Update README.md	4 months ago
data_users.json	data to train the model	4 months ago
index.html	edited the location file for the codes	4 months ago
init.js	Update init.js	4 months ago
jquery.js	Add files via upload	4 months ago
k-nearest.js	Add files via upload	4 months ago

Machine Learning
- Learning algorithms -

Neural Networks

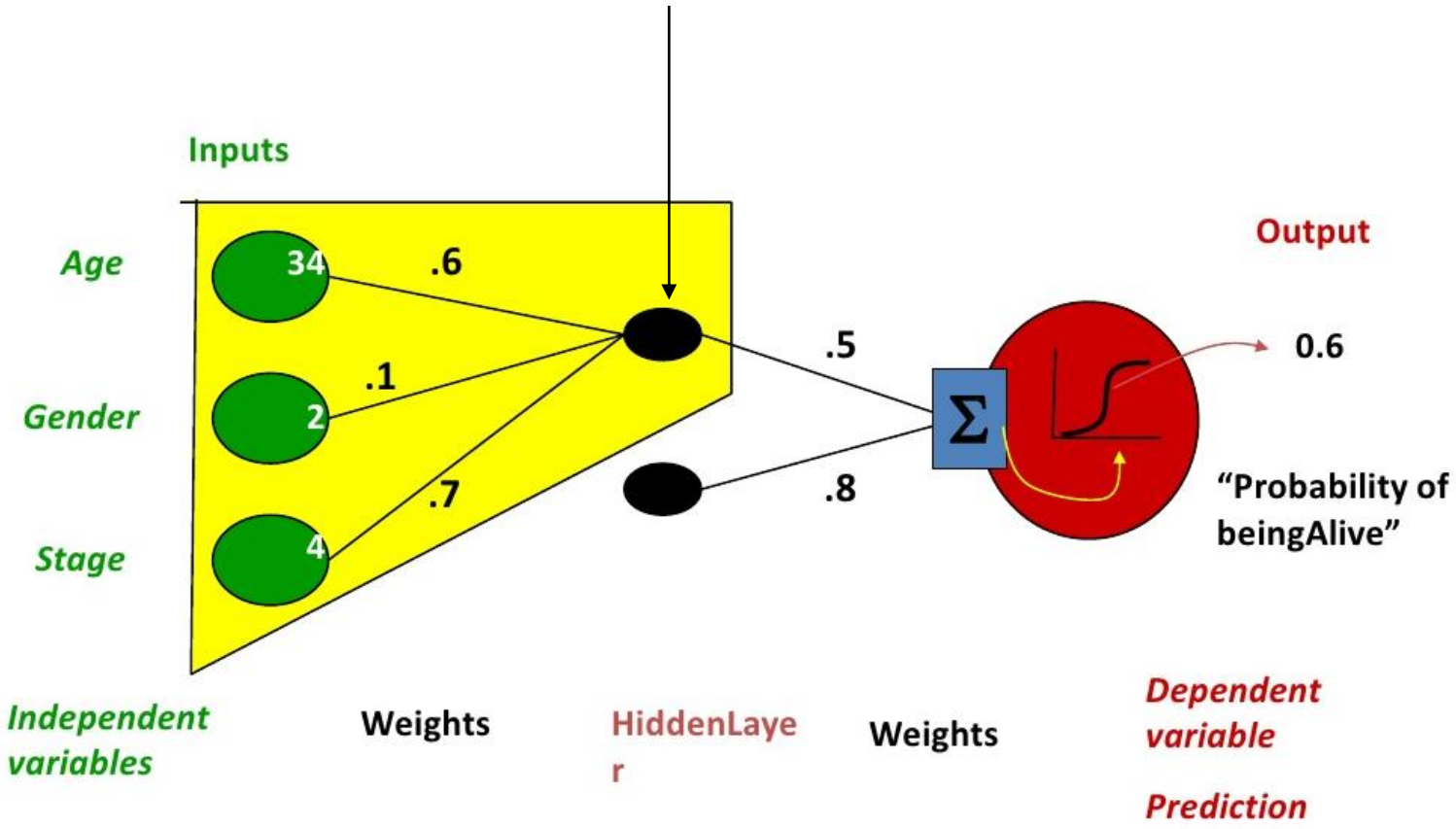


Machine Learning

- Learning algorithms -

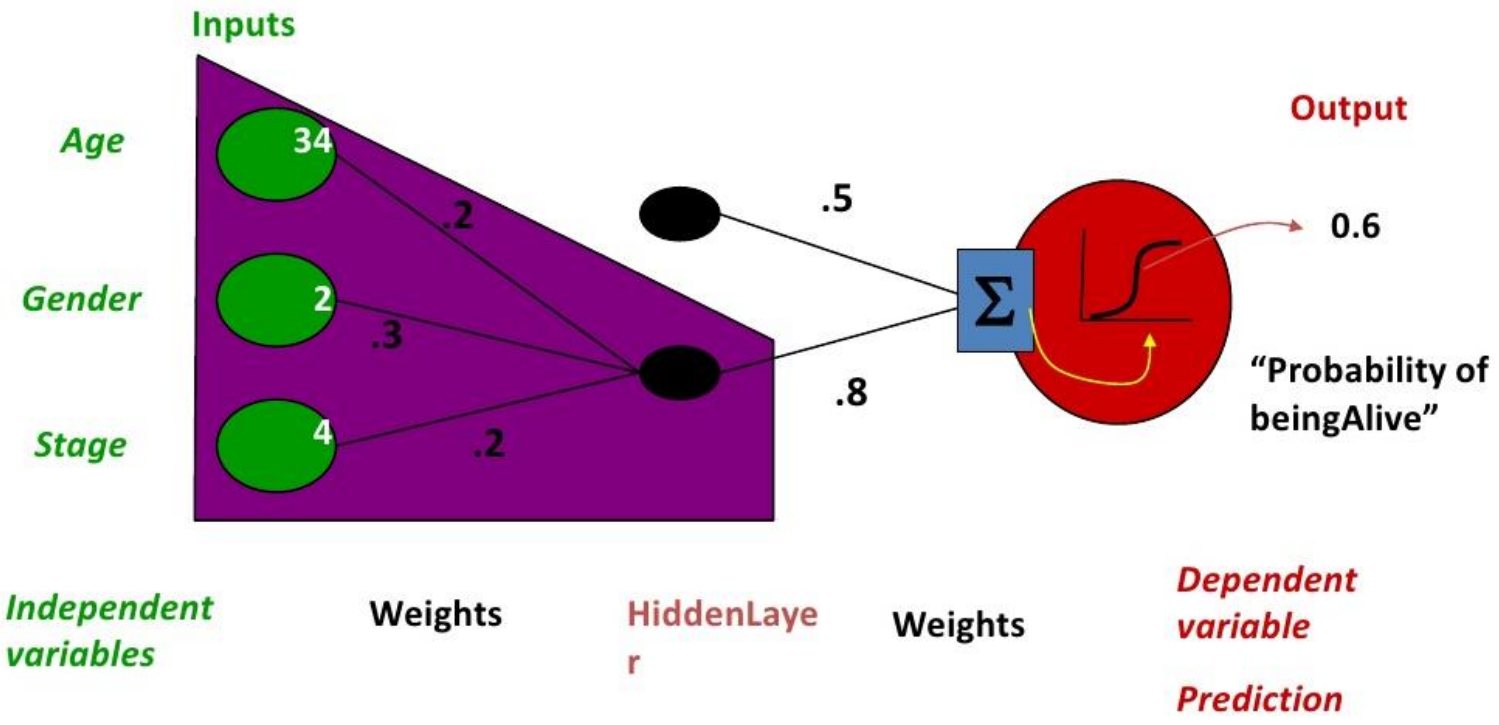
Neural Networks

$$h_\theta(x) = g(\theta^T x) = \frac{1}{1 + e^{-\theta^T x}},$$



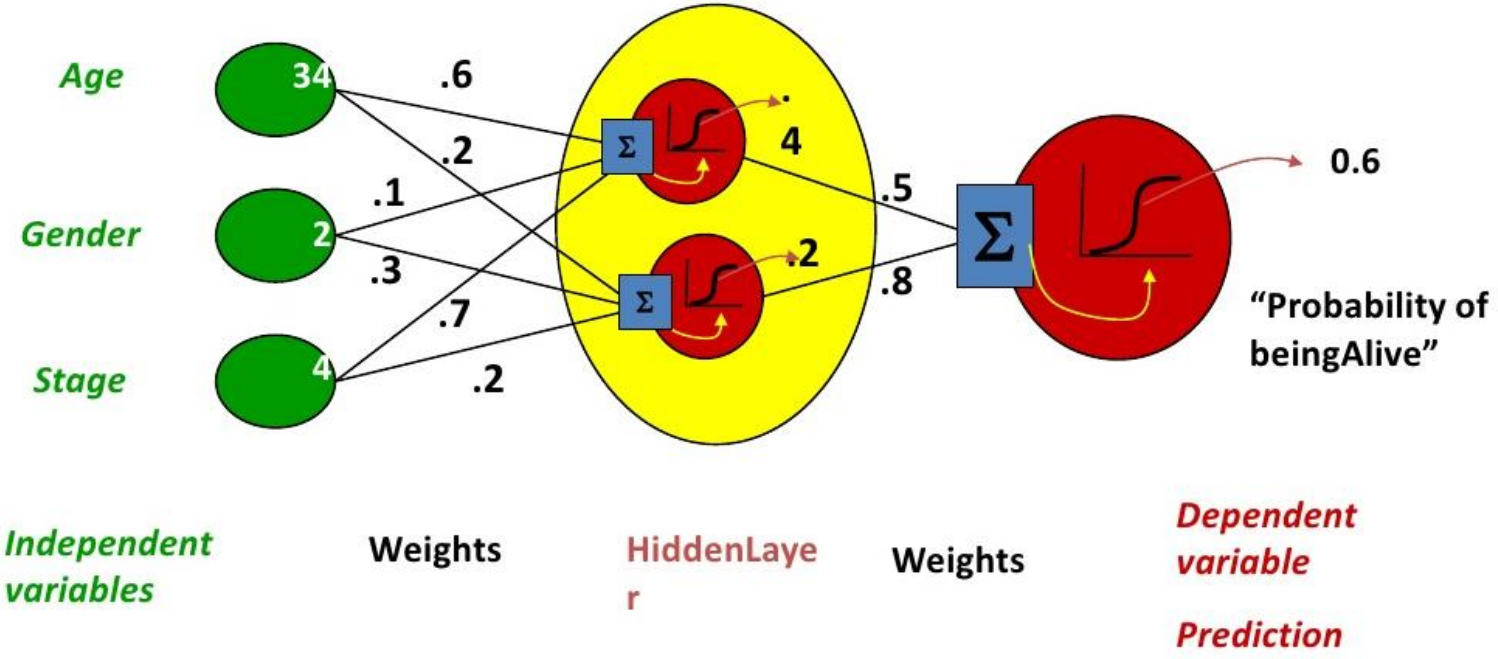
Machine Learning
- Learning algorithms -

Neural Networks



Machine Learning
- Learning algorithms -

Neural Networks



Machine Learning

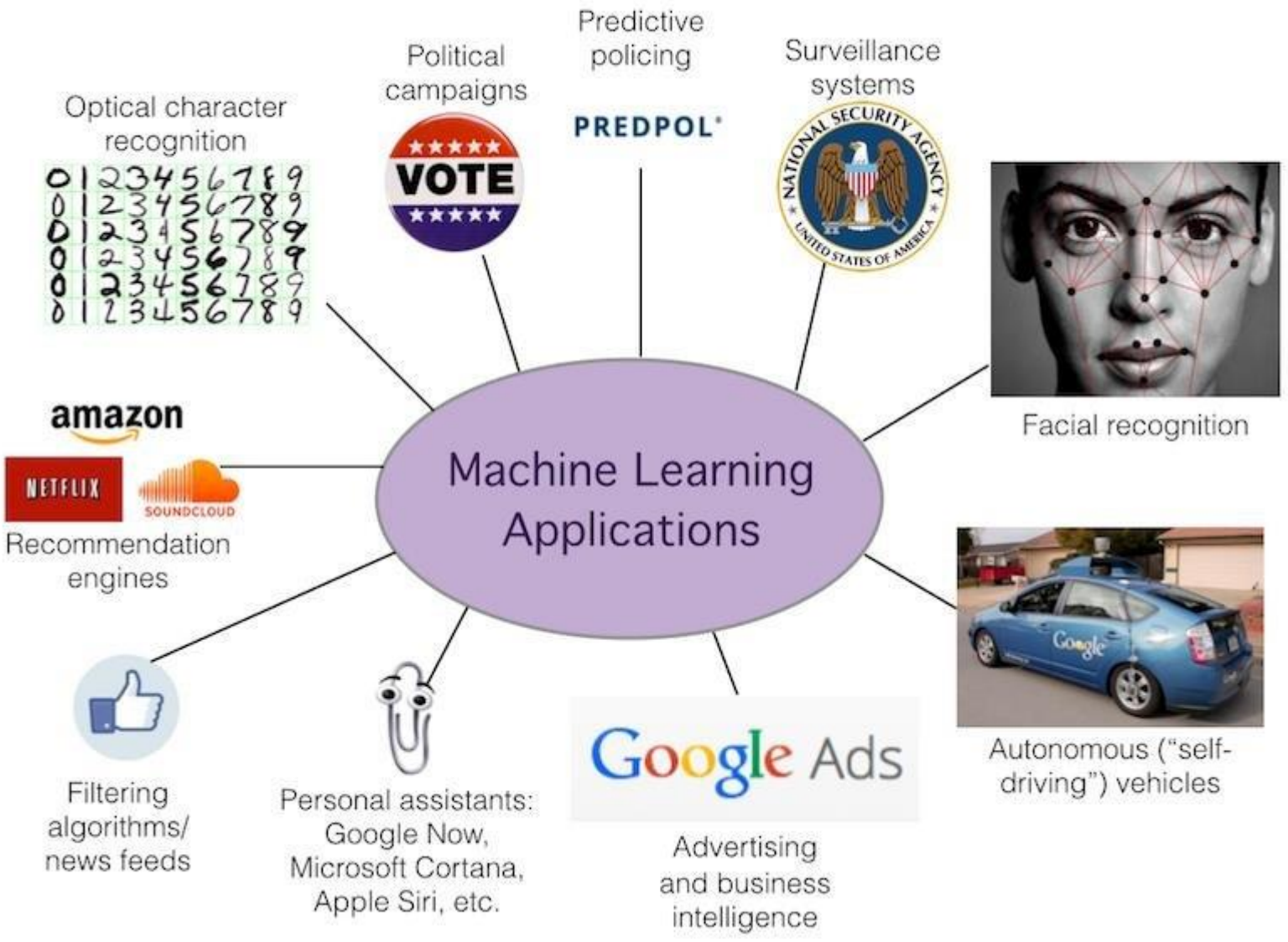
- Learning algorithms -

There is more !!

- Decision trees
- SVM
- Random Forest
- Naive-bayes
- K-means
- Logistic regression

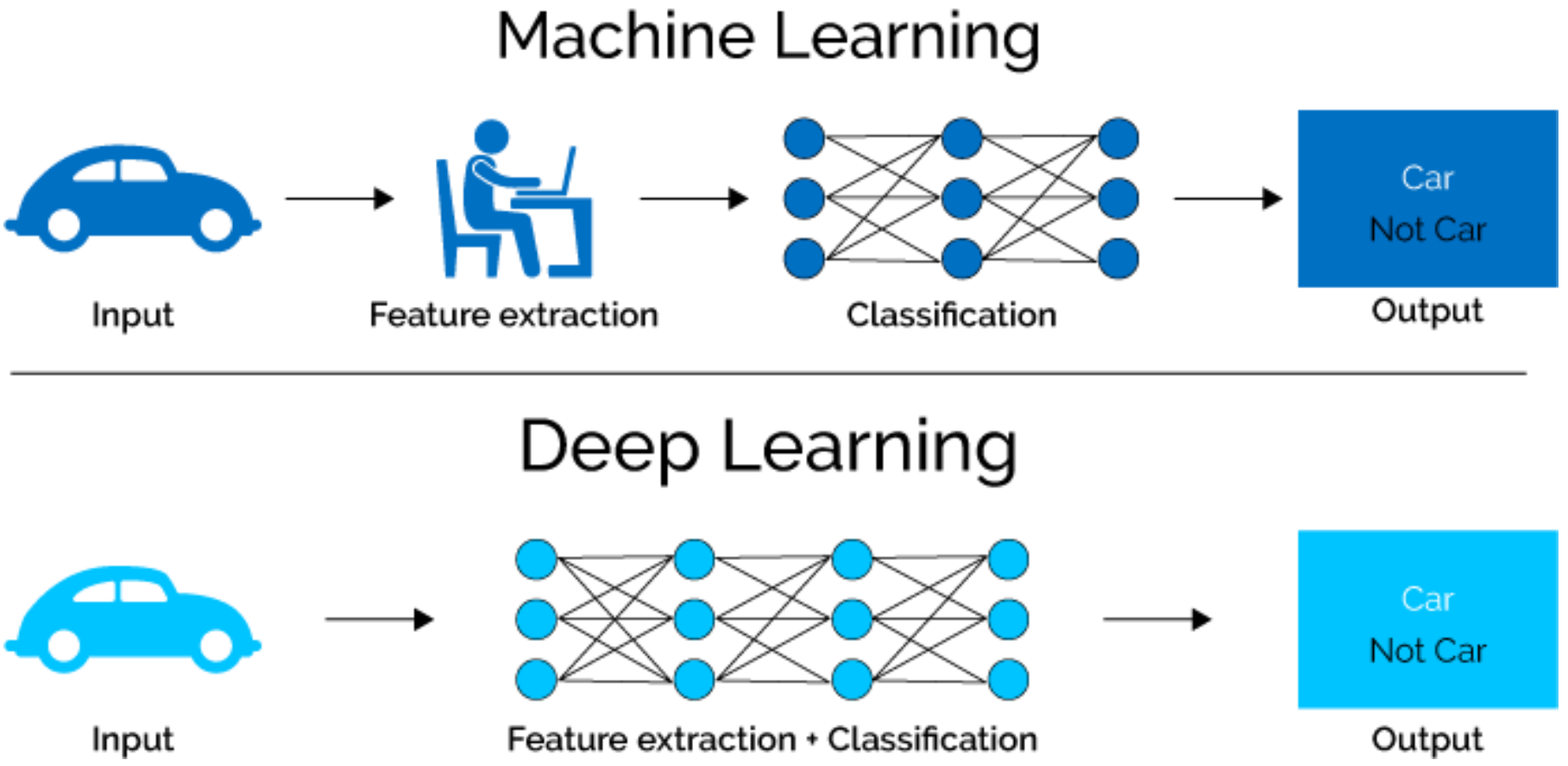
Machine Learning

- Learning algorithms -



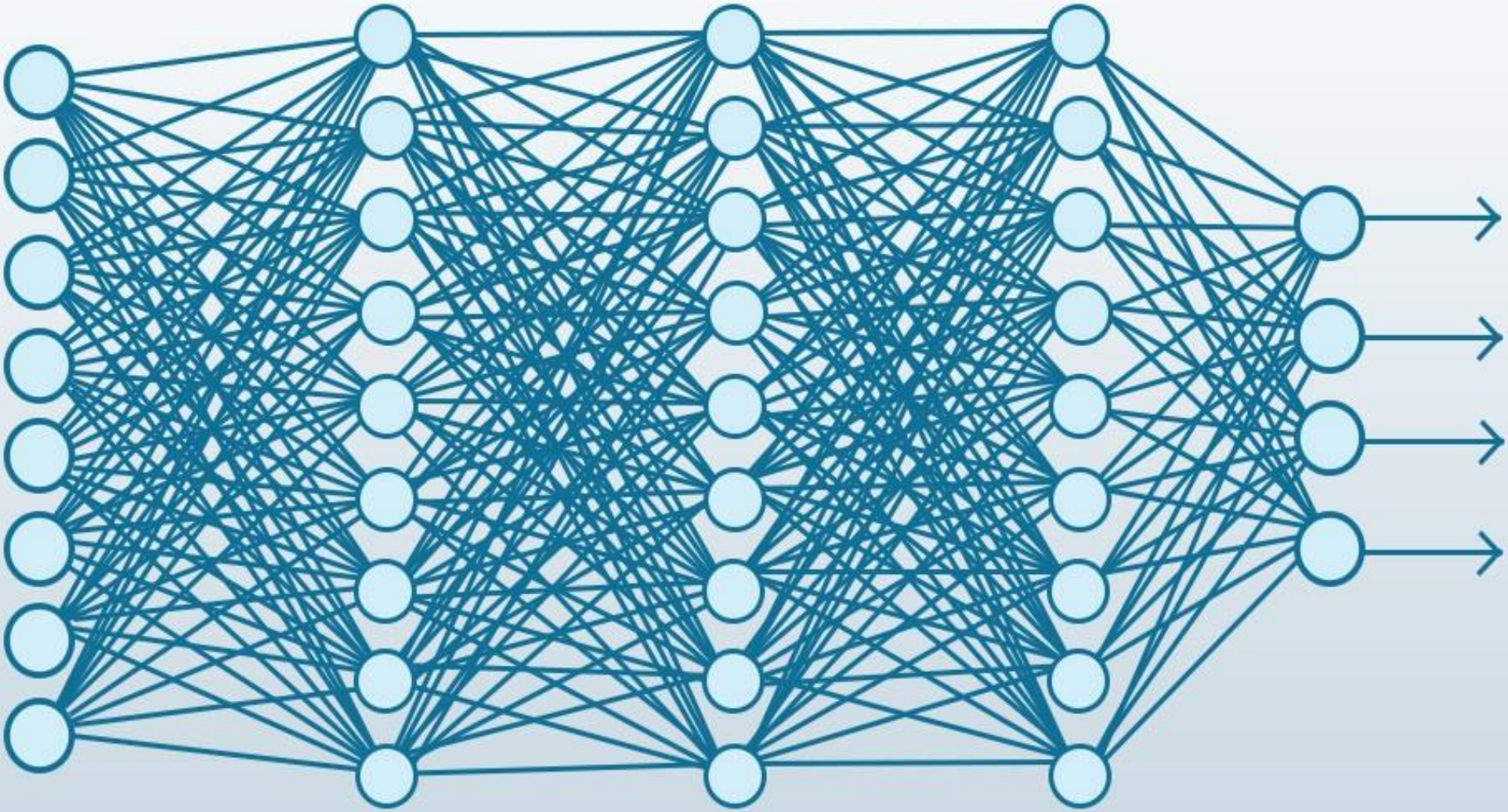
Statistical _AI

- Deep Learning (Apprentissage profond)

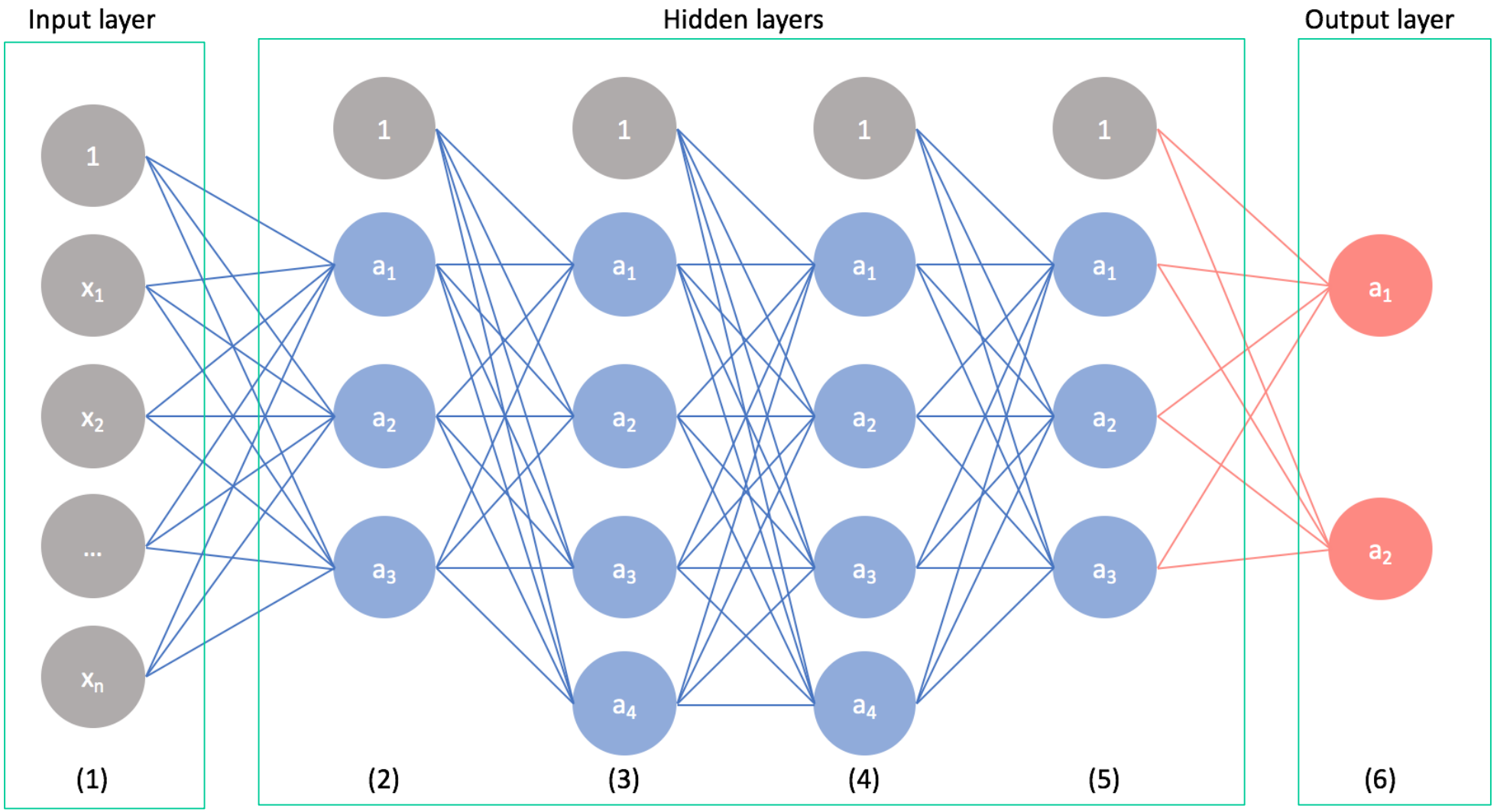


Deep Learning

- Learning algorithms -



Deep Learning



Les variables d'entrée

Les couches cachées : a(i) correspond à l'activation de ce nœud tel que : a(1) = f(1,x1,x2,,,,,xn) et f est la fonction sigmoid par exemple ,

Deep Learning

- Applications -

- Computer vision and object detection

- Angel eyes : an app for blind people that can detect objects around the person in real time and report the situation .

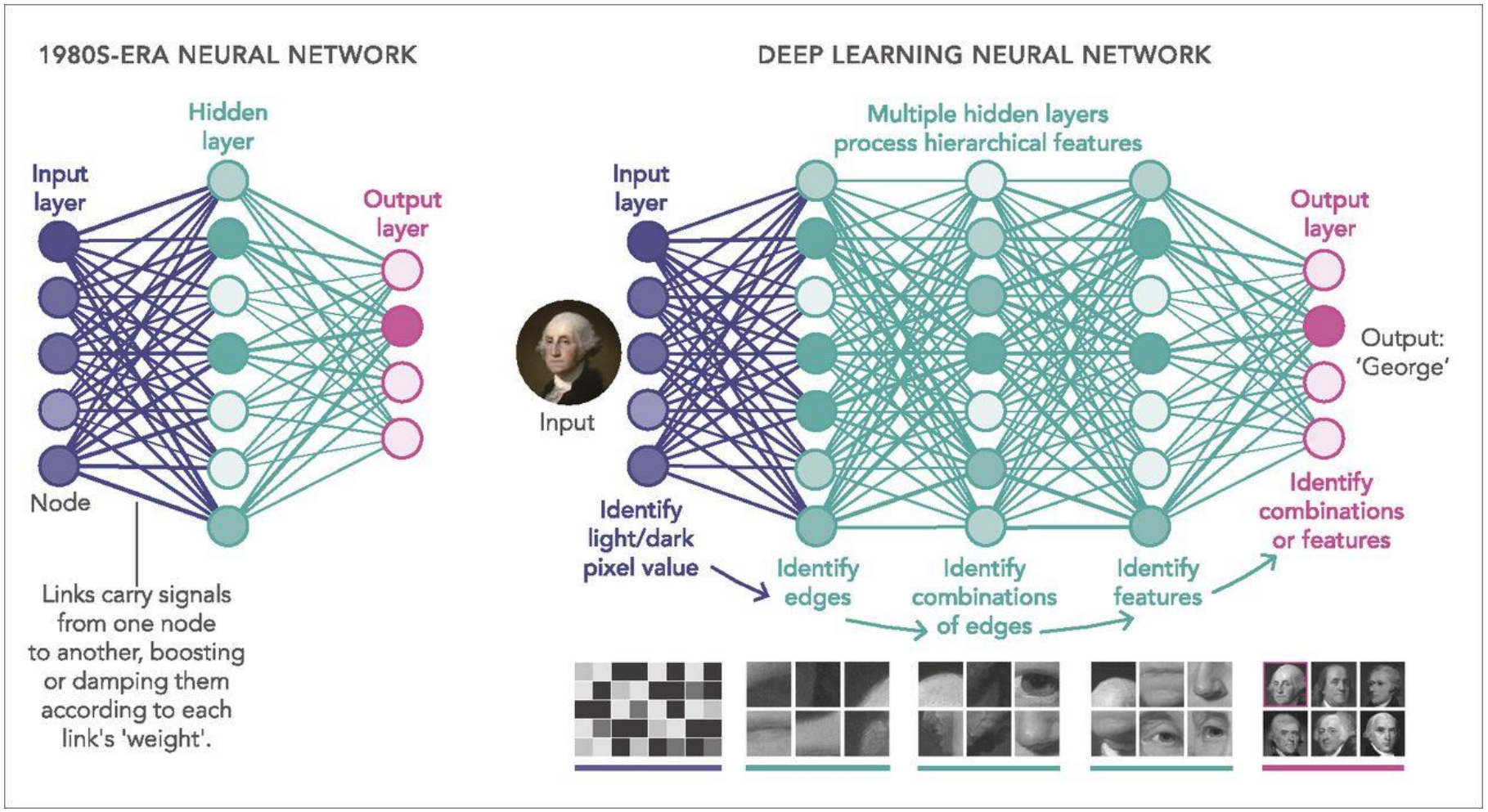
  Projet open source : https://github.com/InseaAngel/Angel-Eyes

Deep Learning

- Applications -

- Facial detection and recognition
    - Detecting faces with high precision using a pre-trained neural network and classify face into « zakaria» and other « other» . Projet open source : https://github.com/InseaAngel/Angel-Eyes

“Neural network” models of AI process signals by sending them through a network of nodes analogous to neurons.

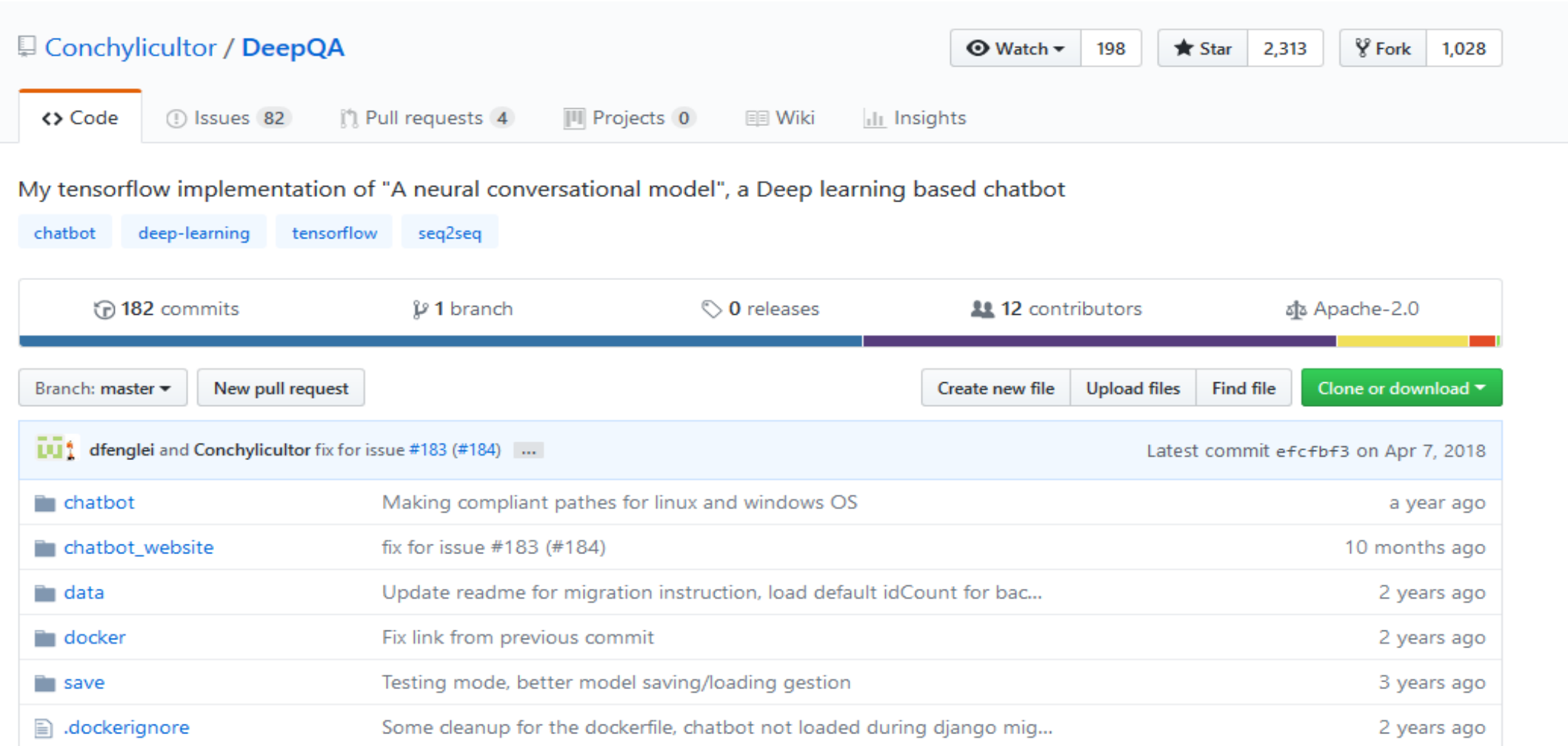


M. Mitchell Waldrop PNAS 2019;116:4:1074-1077

Deep Learning

- Applications -

- Chatbots
  https://github.com/Conchylicultor/DeepQA



Deep Learning

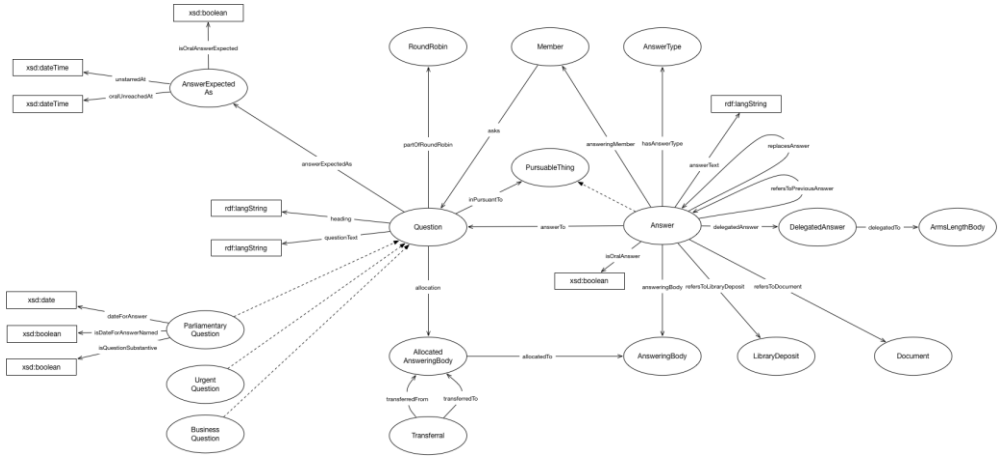
- Applications -

Deep learning chat bots

Question – answer
Question - answer
Question - answer
Question - answer
Question - answer
Question - answer
Question - answer
Question - answer
Question - answer
Question - answer

input :dataset

Symbolic ai chatbots



input : ontology
lexical - syntax –semantical knowledge

I want to learn

Follow people and read papers

Thank you

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