





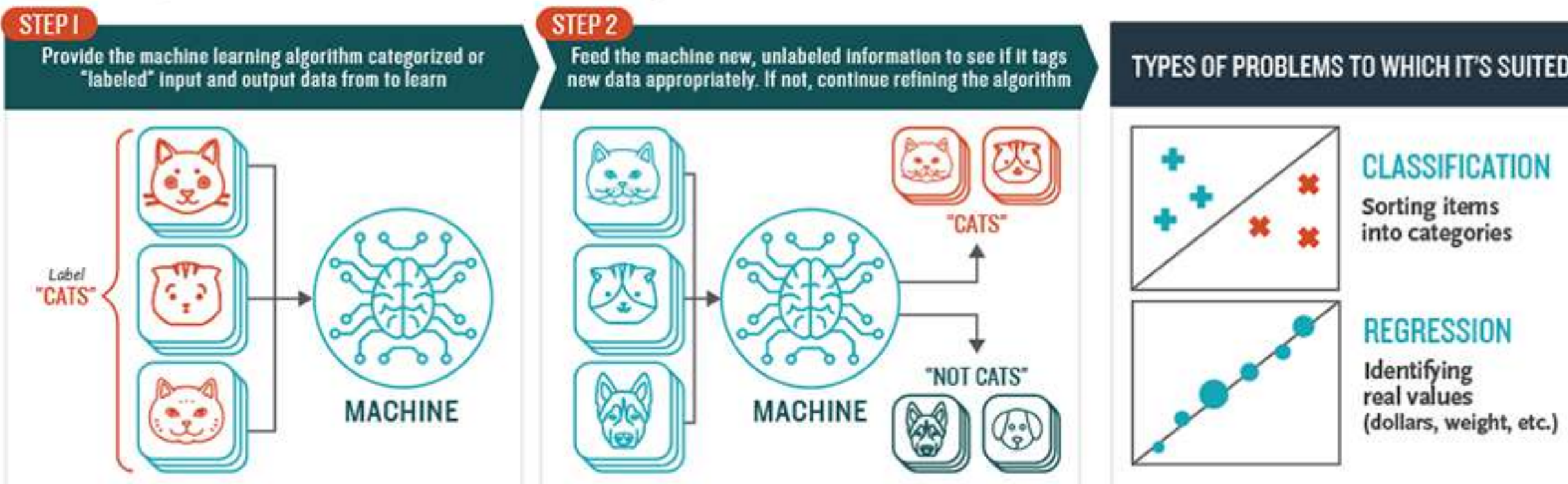
“Notre mission est d’offrir une éducation IA de classe mondiale à n’importe qui sur Terre gratuitement.

Nos portes sont ouvertes à tous ceux qui souhaitent apprendre.

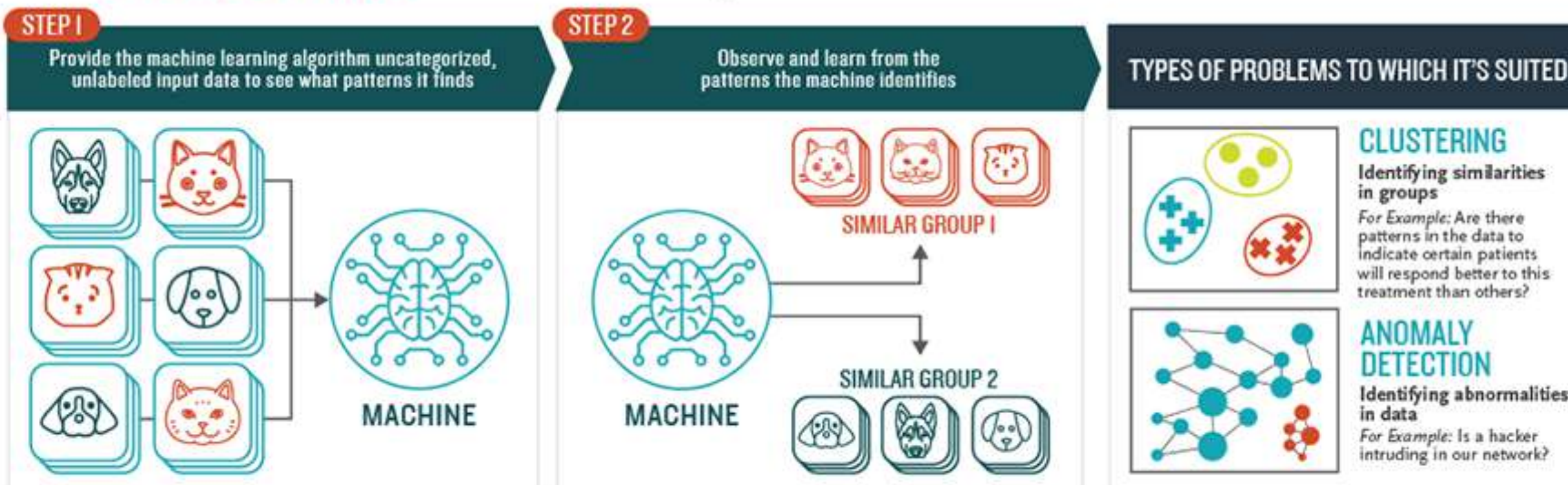
Nous sommes une communauté qui s’étend sur presque tous les pays dédiée à enseigner aux étudiants comment avoir un impact positif en utilisant l’intelligence artificielle que ce soit par l’emploi ou l’entrepreneuriat. ”

Apprentissage Supervisé - Apprentissage Non Supervisé

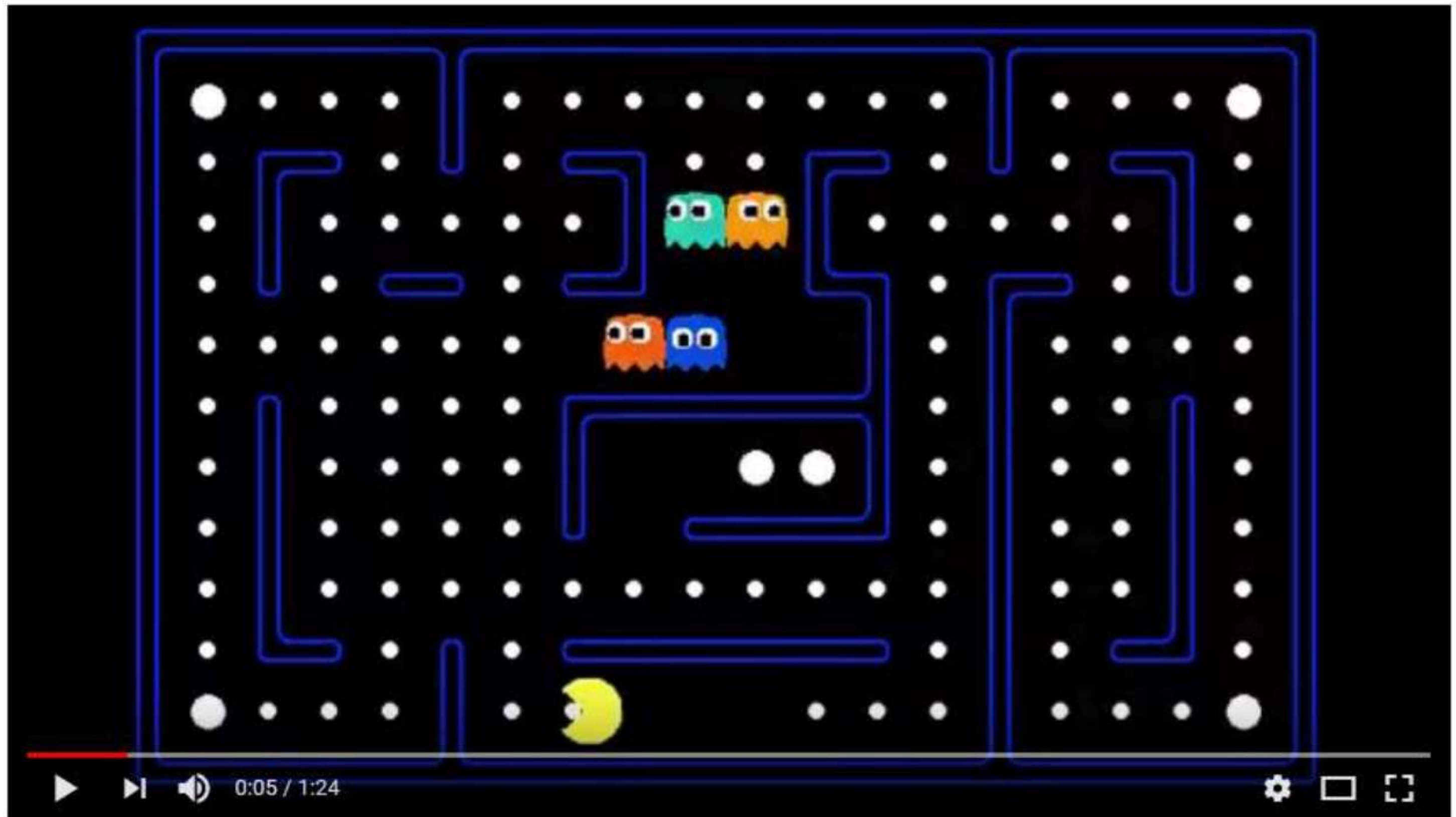
How **Supervised** Machine Learning Works



How **Unsupervised** Machine Learning Works



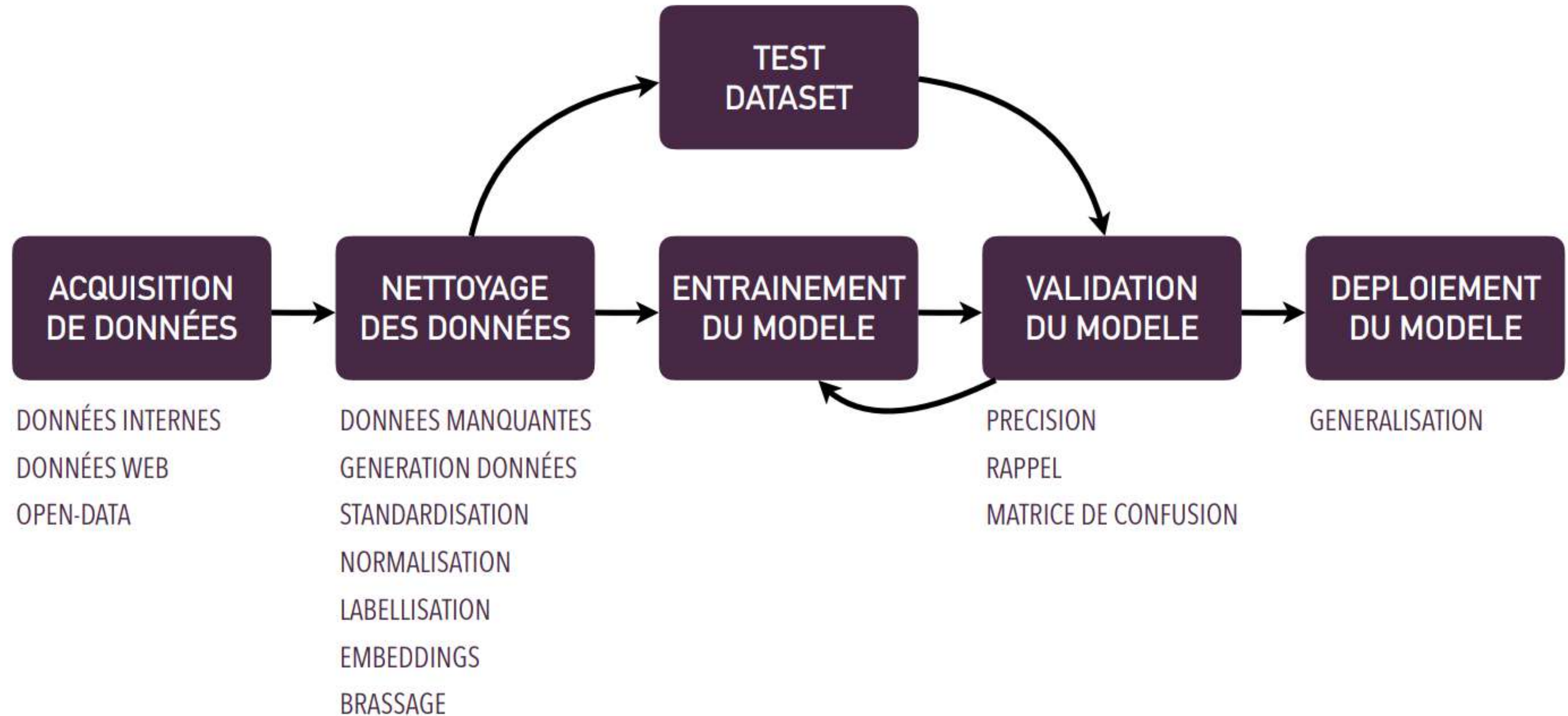
Apprentissage par Renforcement



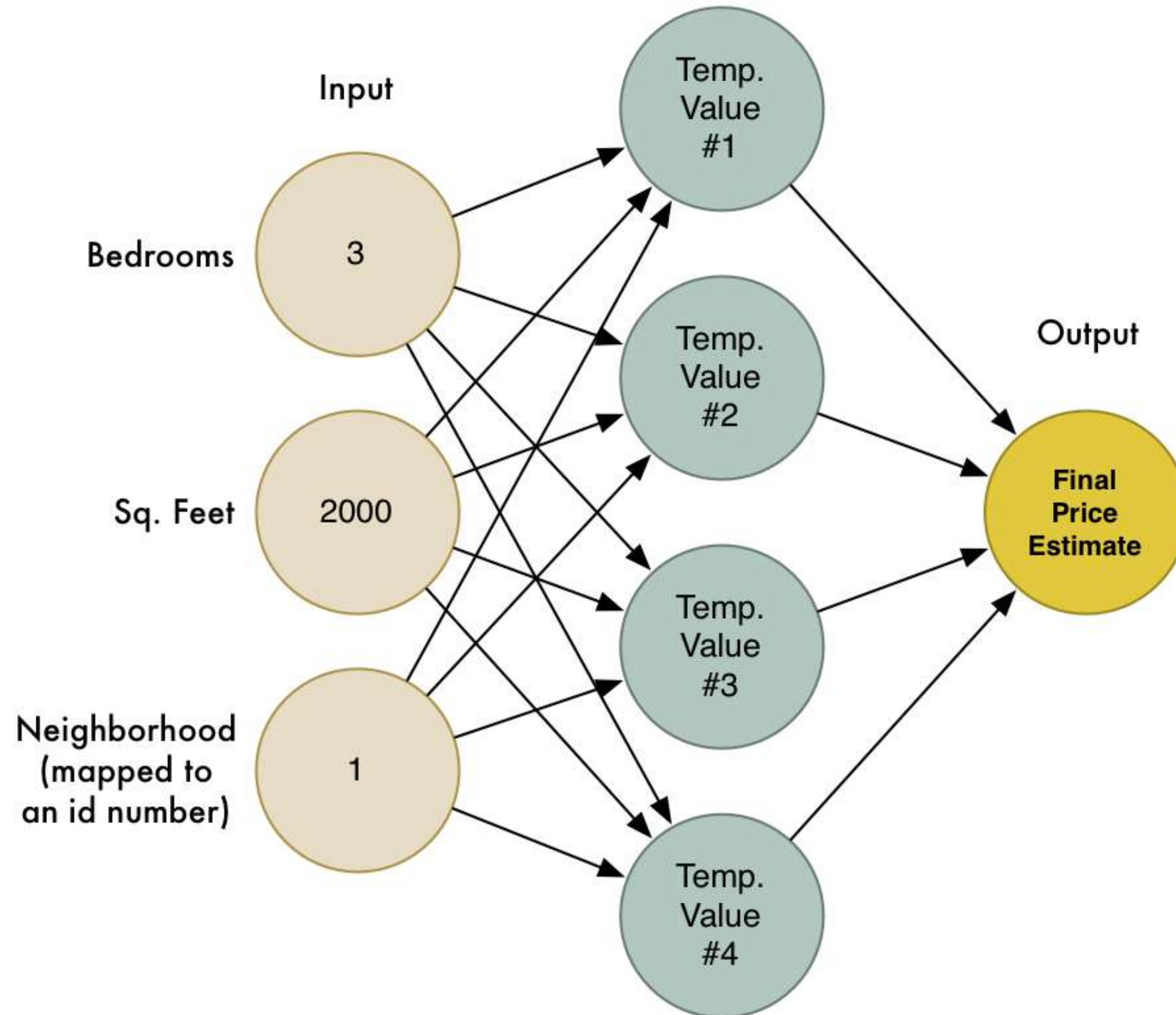
Neural network learns to play pacman

<https://youtu.be/t5--kLRI4UE>

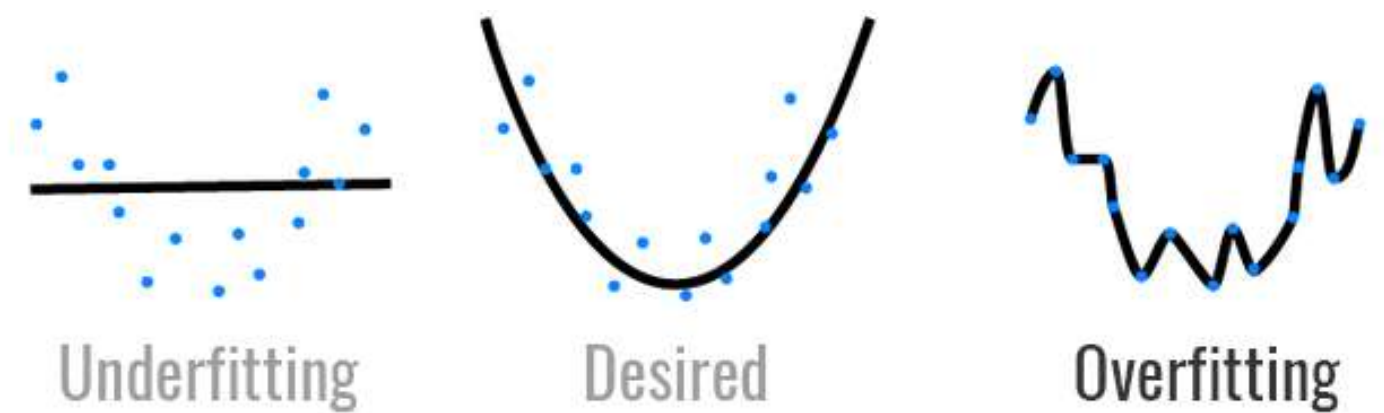
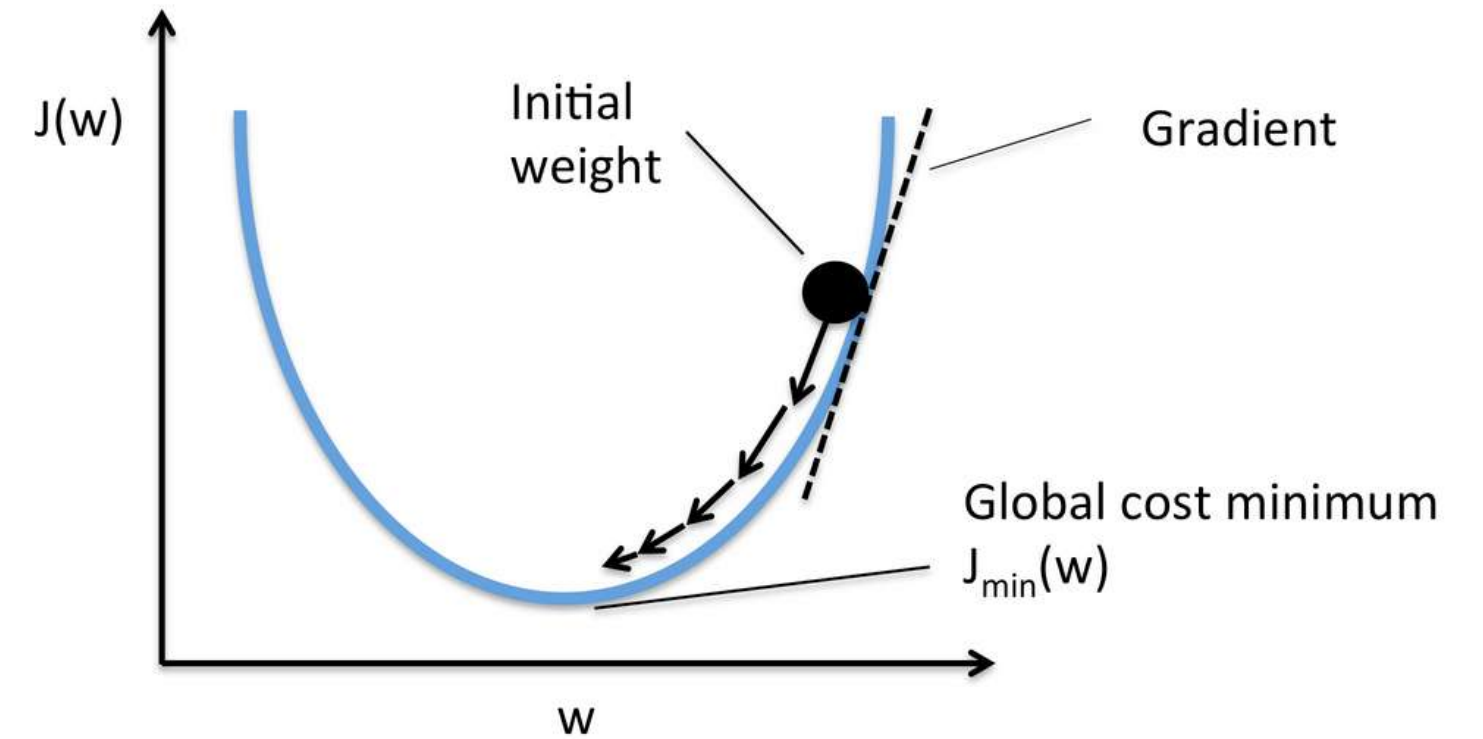
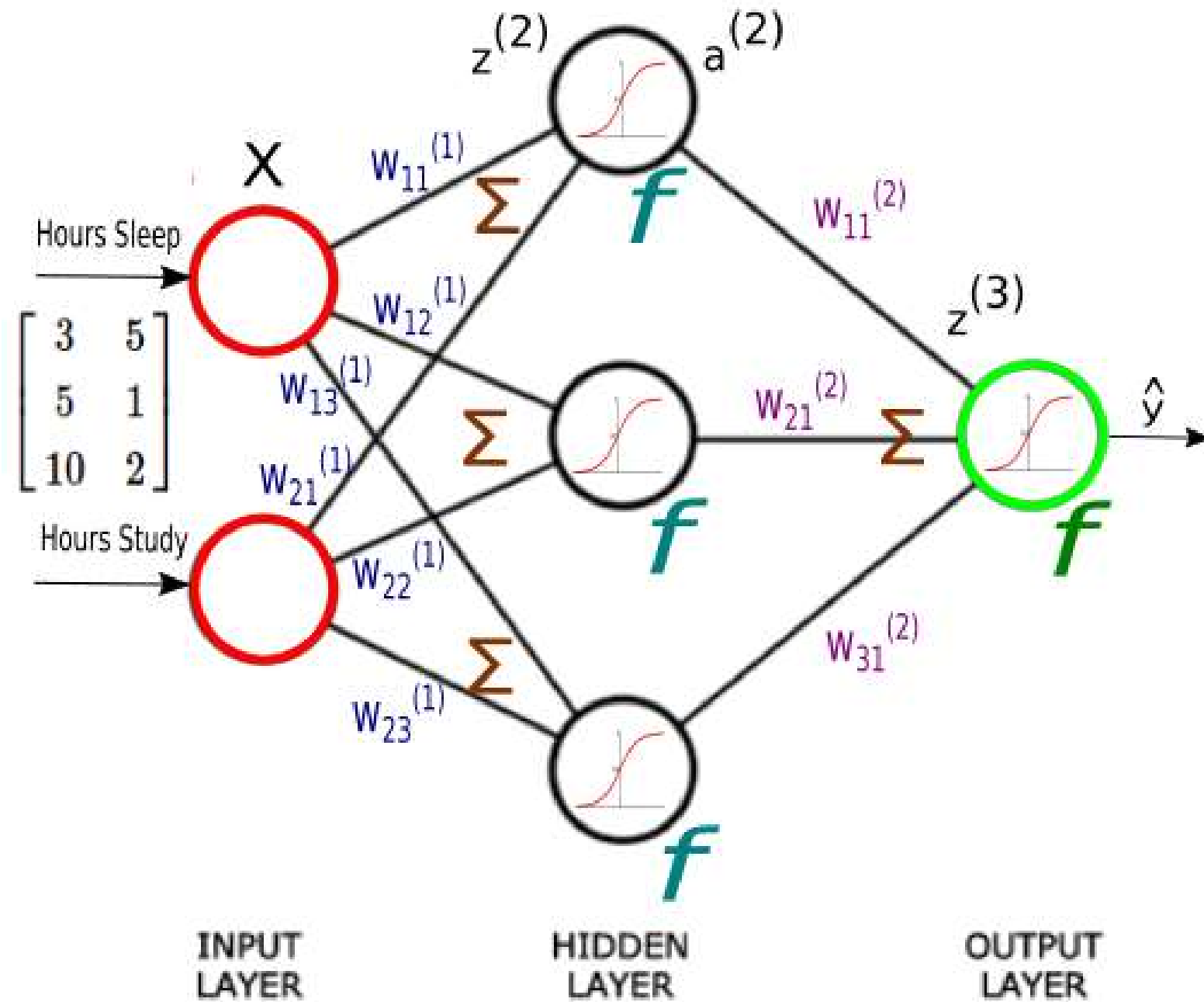
Cycle de Vie d'un Projet d'Intelligence Artificielle



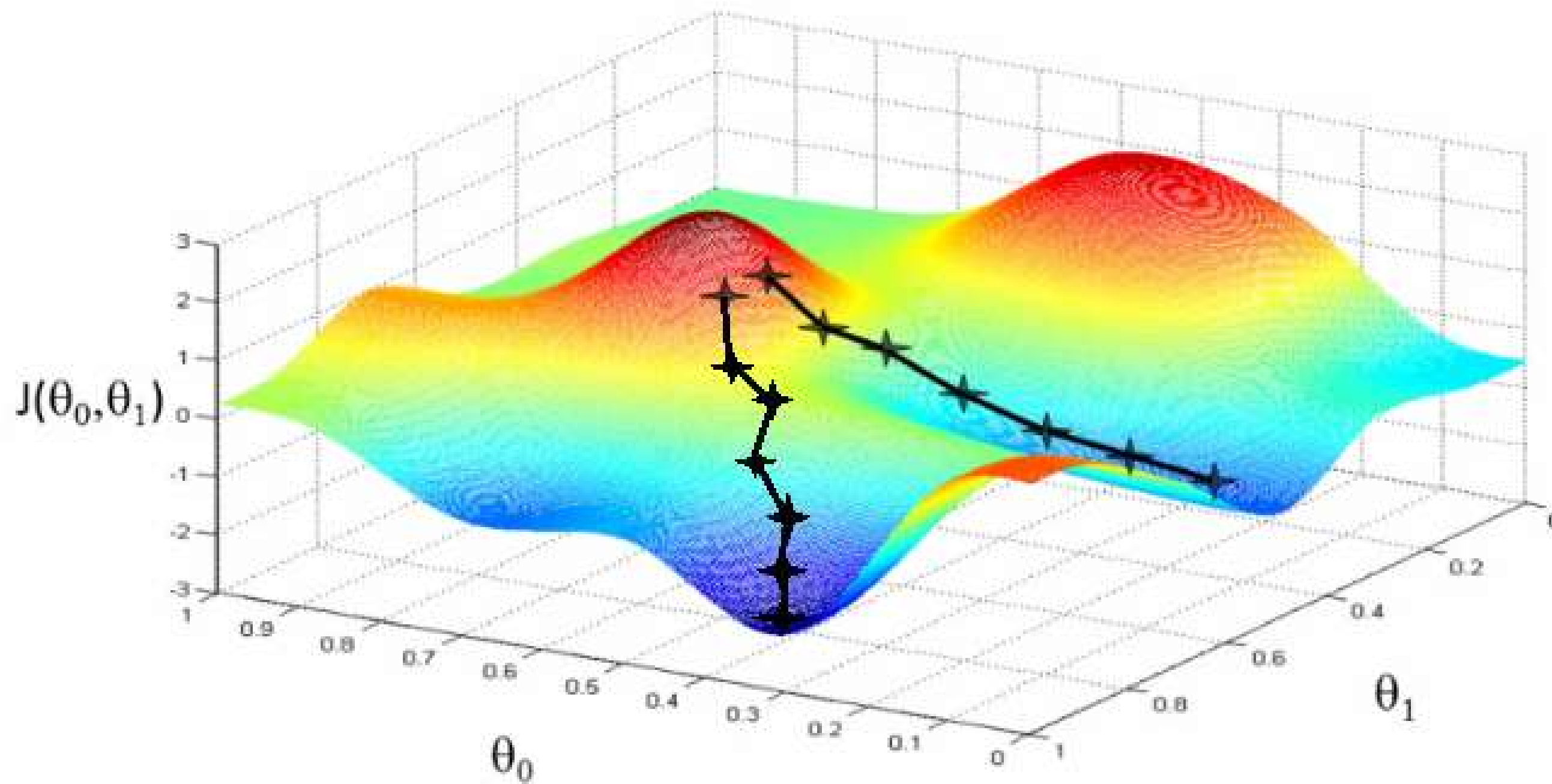
La Hype du Projet : Le Reseau de Neurones



La Hype du Projet : L'Ajustement des Poids par Retropropagation



La Hype du Projet : La Descente de Gradient

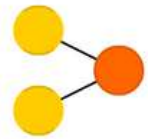


La Hype du Projet : Les Réseaux de Neurones

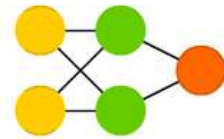
A mostly complete chart of Neural Networks

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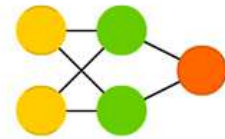
Perceptron (P)



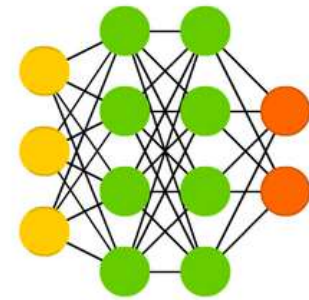
Feed Forward (FF)



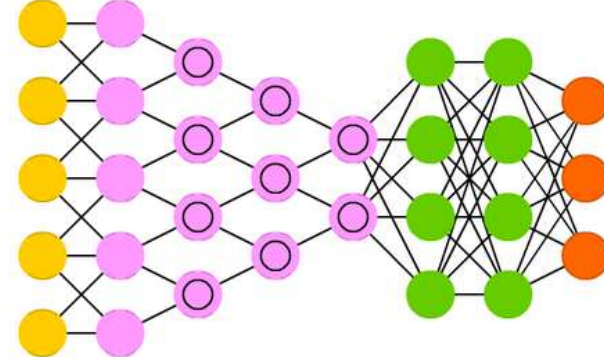
Radial Basis Network (RBF)



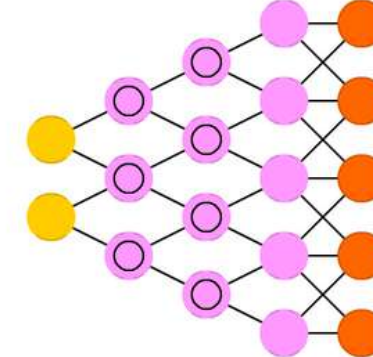
Deep Feed Forward (DFF)



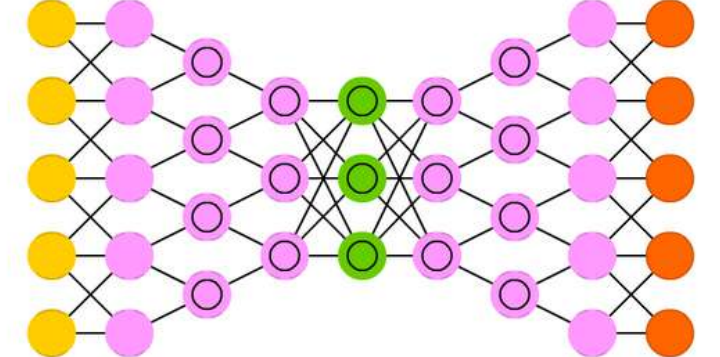
Deep Convolutional Network (DCN)



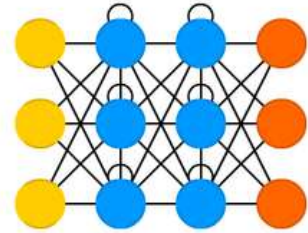
Deconvolutional Network (DN)



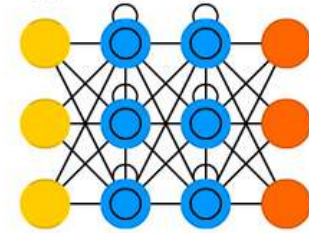
Deep Convolutional Inverse Graphics Network (DCIGN)



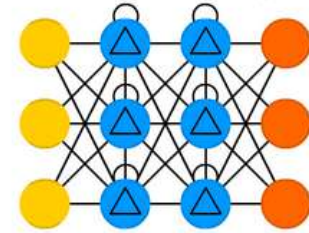
Recurrent Neural Network (RNN)



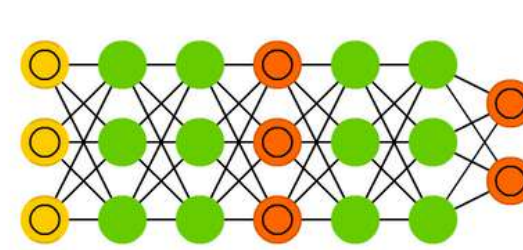
Long / Short Term Memory (LSTM)



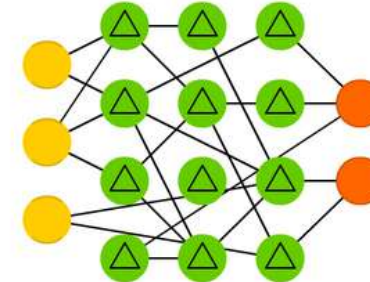
Gated Recurrent Unit (GRU)



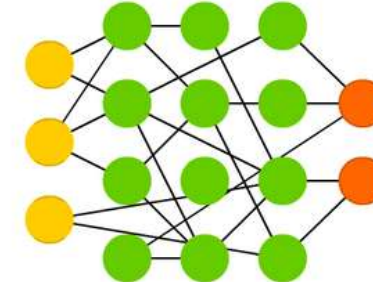
Generative Adversarial Network (GAN)



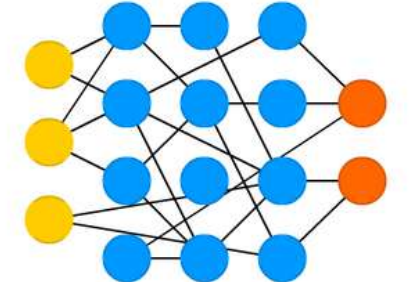
Liquid State Machine (LSM)



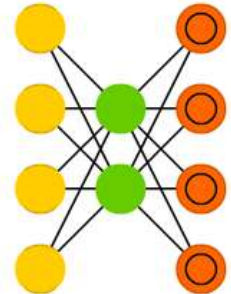
Extreme Learning Machine (ELM)



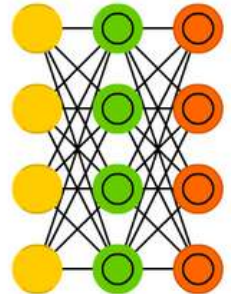
Echo State Network (ESN)



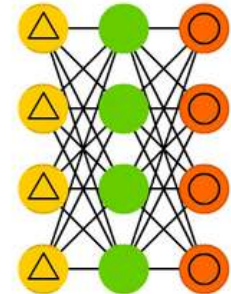
Auto Encoder (AE)



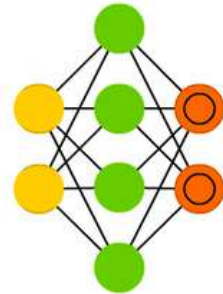
Variational AE (VAE)



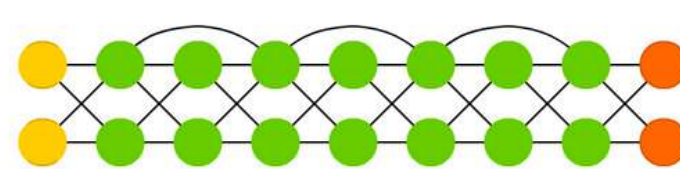
Denoising AE (DAE)



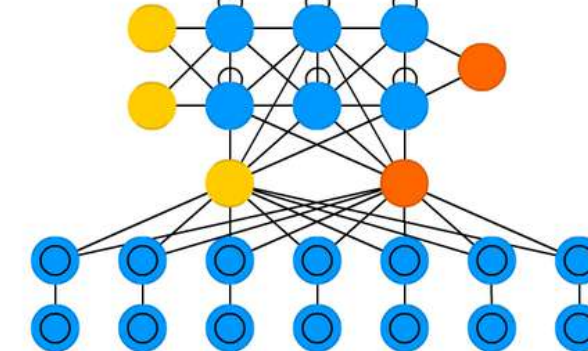
Sparse AE (SAE)



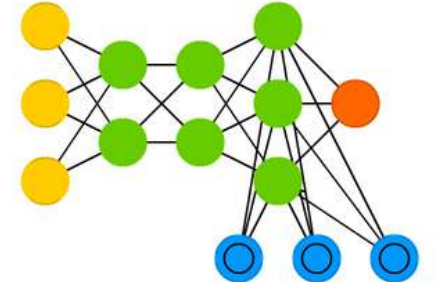
Deep Residual Network (DRN)



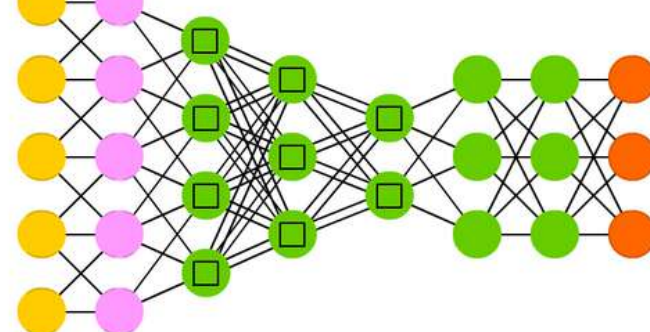
Differentiable Neural Computer (DNC)



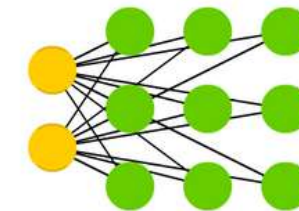
Neural Turing Machine (NTM)



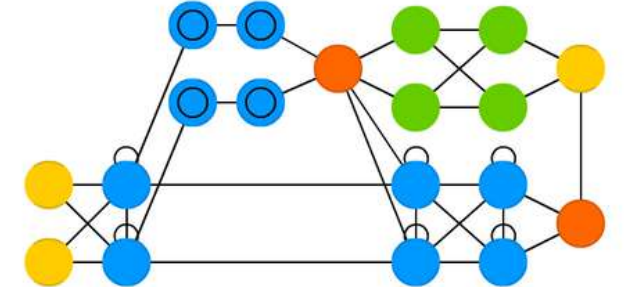
Capsule Network (CN)



Kohonen Network (KN)



Attention Network (AN)





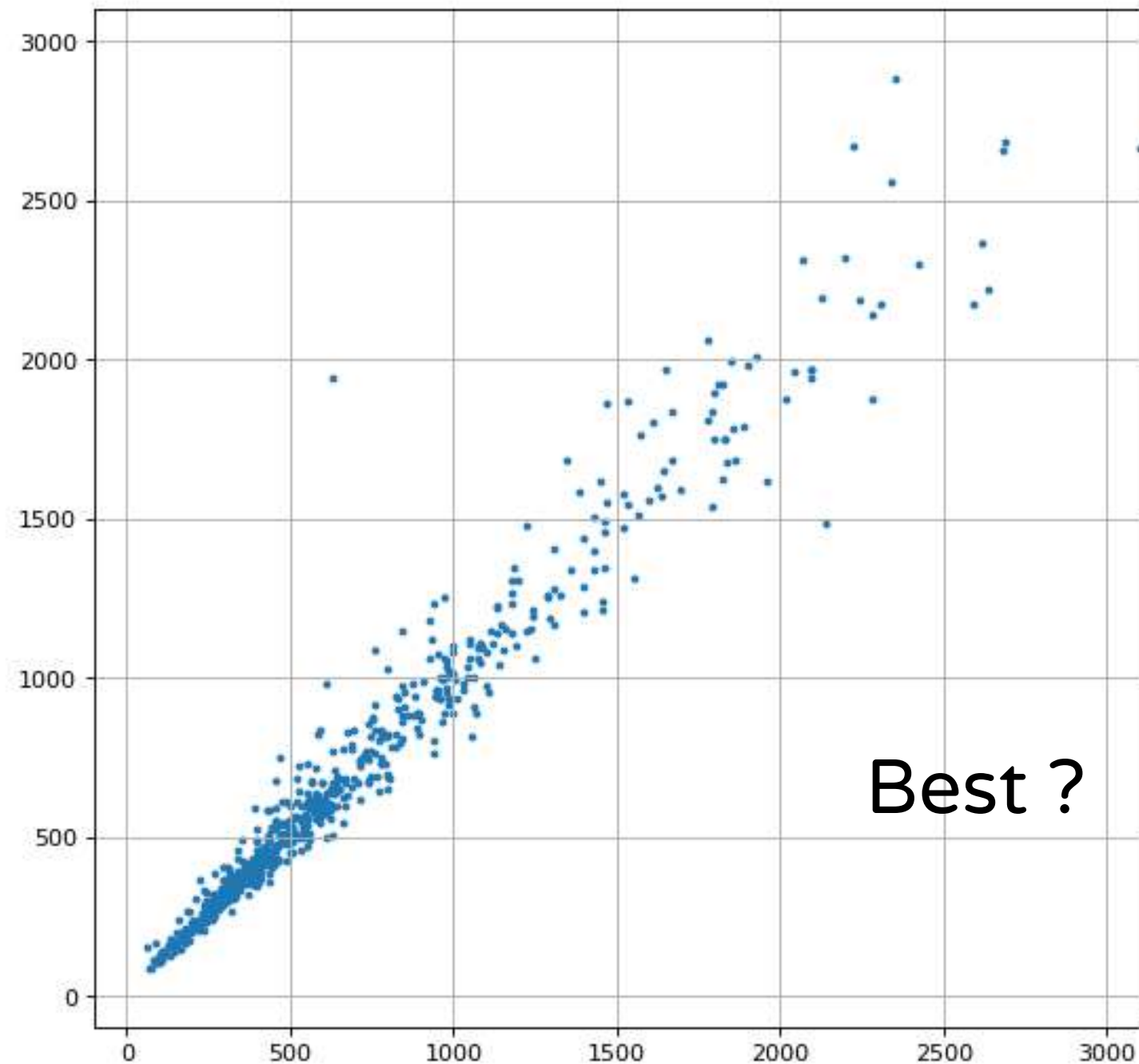
"Un réseau 'moyen' entraîné avec d'excellentes données vaut mieux qu'un excellent réseau entraîné avec de mauvaises données"

@vincentporte ©2019



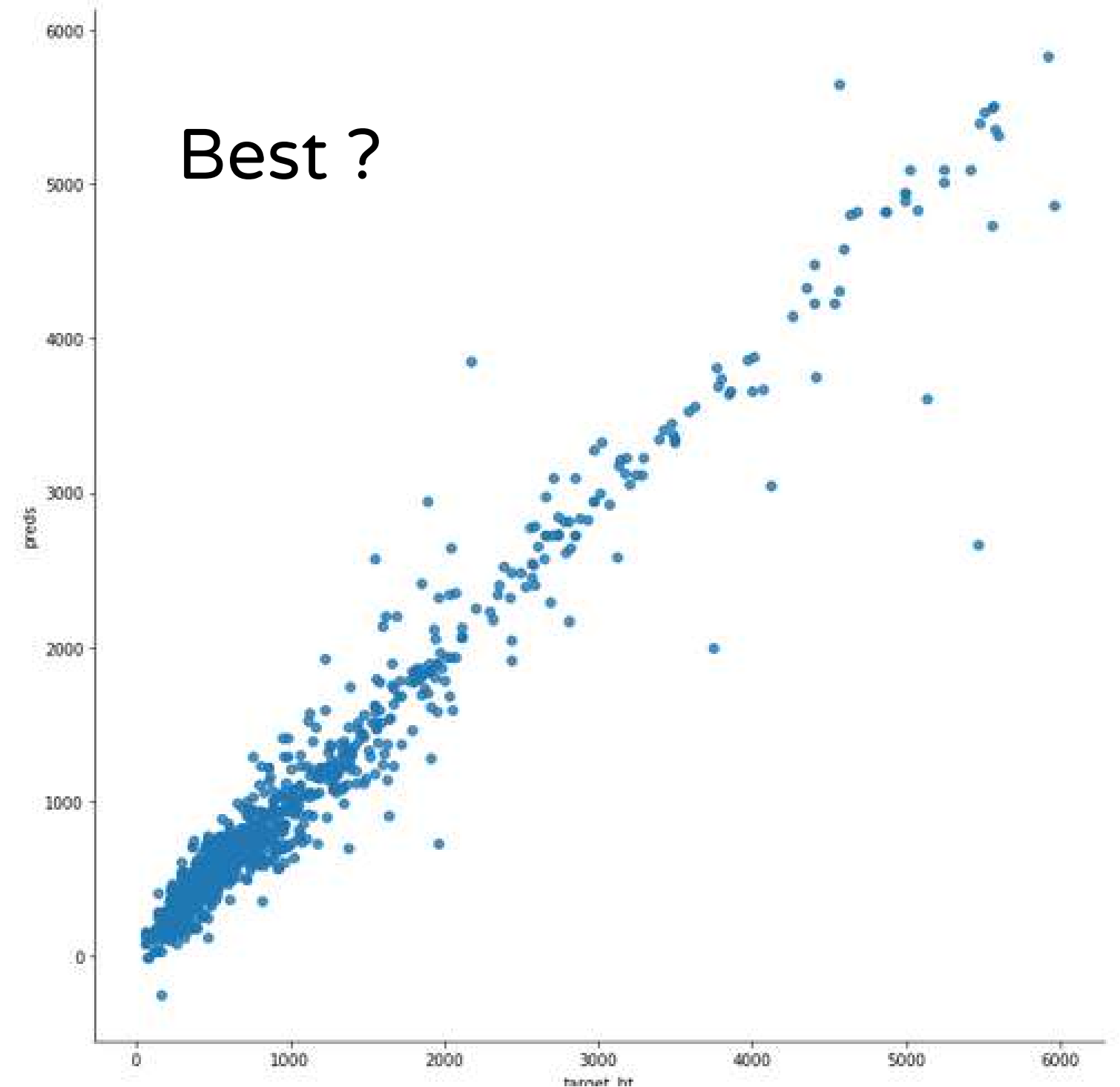
Le Coeur du Projet : Evaluer

```
y_train_pred = regressor.predict(X_train)
plt.figure(figsize=(8, 8), dpi=80)
plt.xlim(-100, 3100)
plt.ylim(-100, 3100)
plt.scatter(y_train, y_train_pred, s=6)
plt.grid()
```



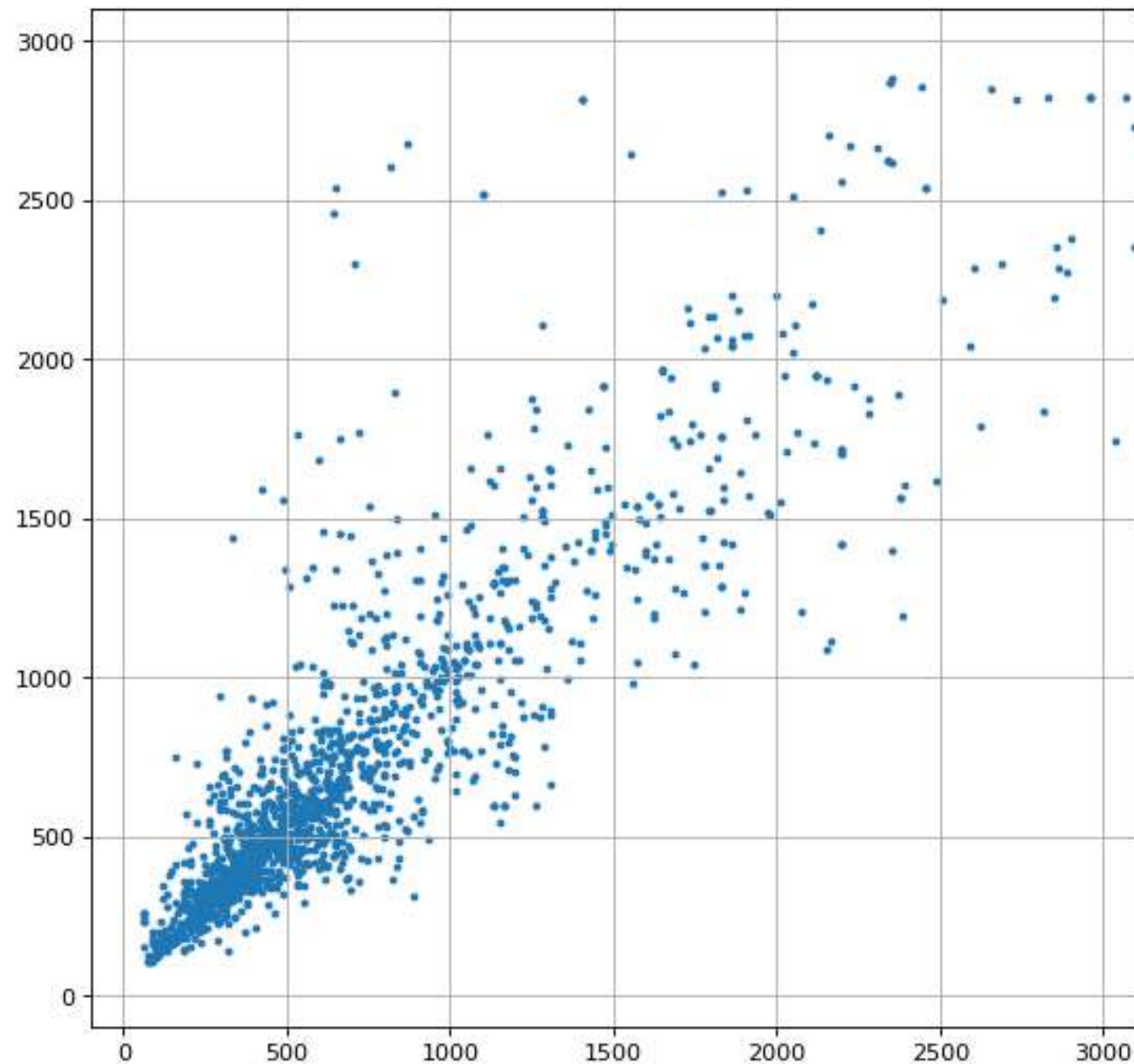
```
sns.lmplot(x="target_ht", y="preds", data=df_train, size=10, fit_reg=None)
```

<seaborn.axisgrid.FacetGrid at 0x7f6f286d6898>



Le Coeur du Projet : Evaluer

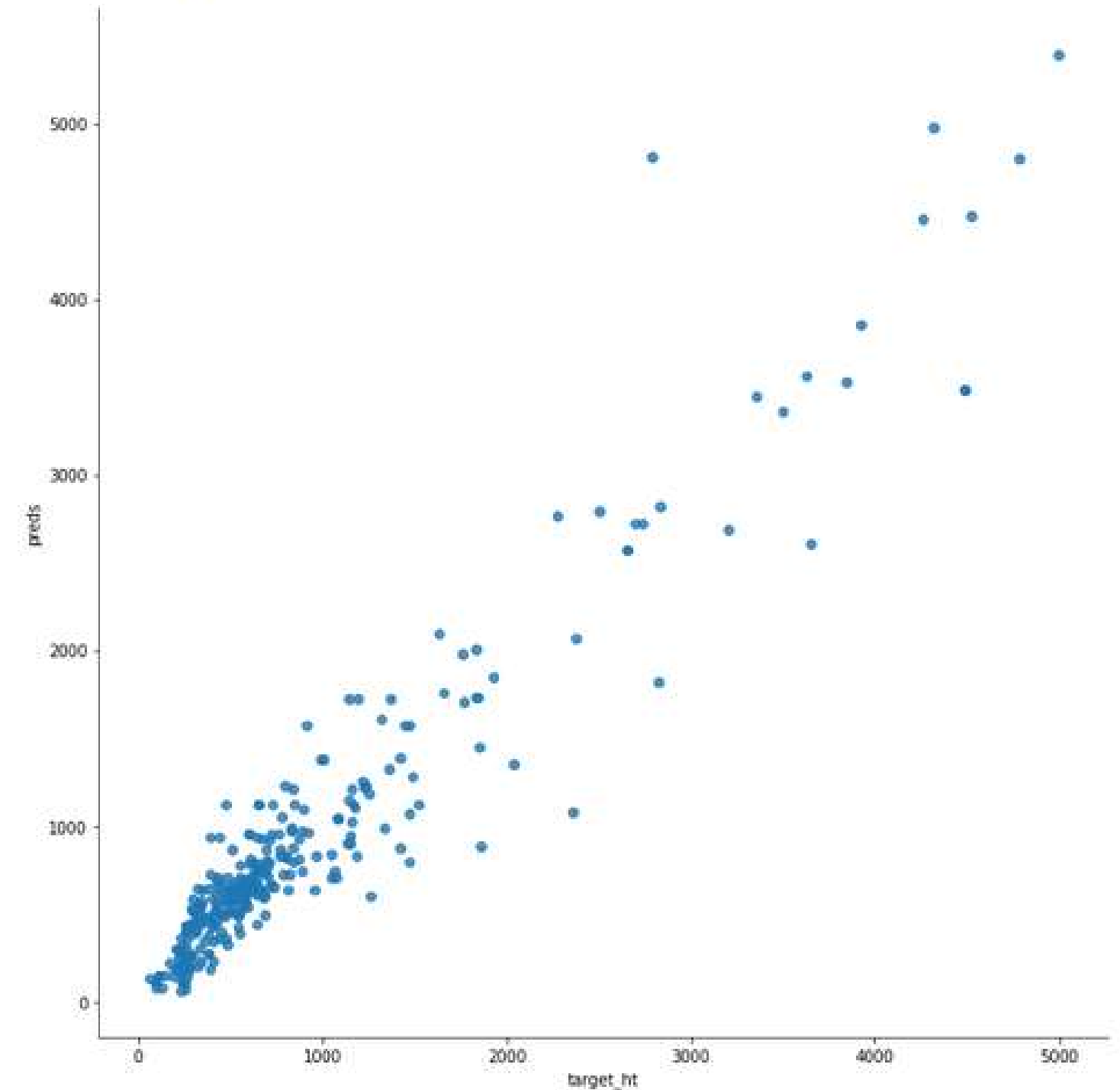
```
plt.figure(figsize=(8, 8), dpi=80)
plt.xlim(-100, 3100)
plt.ylim(-100, 3100)
plt.scatter(y_test, y_pred, s=6)
plt.grid()
```



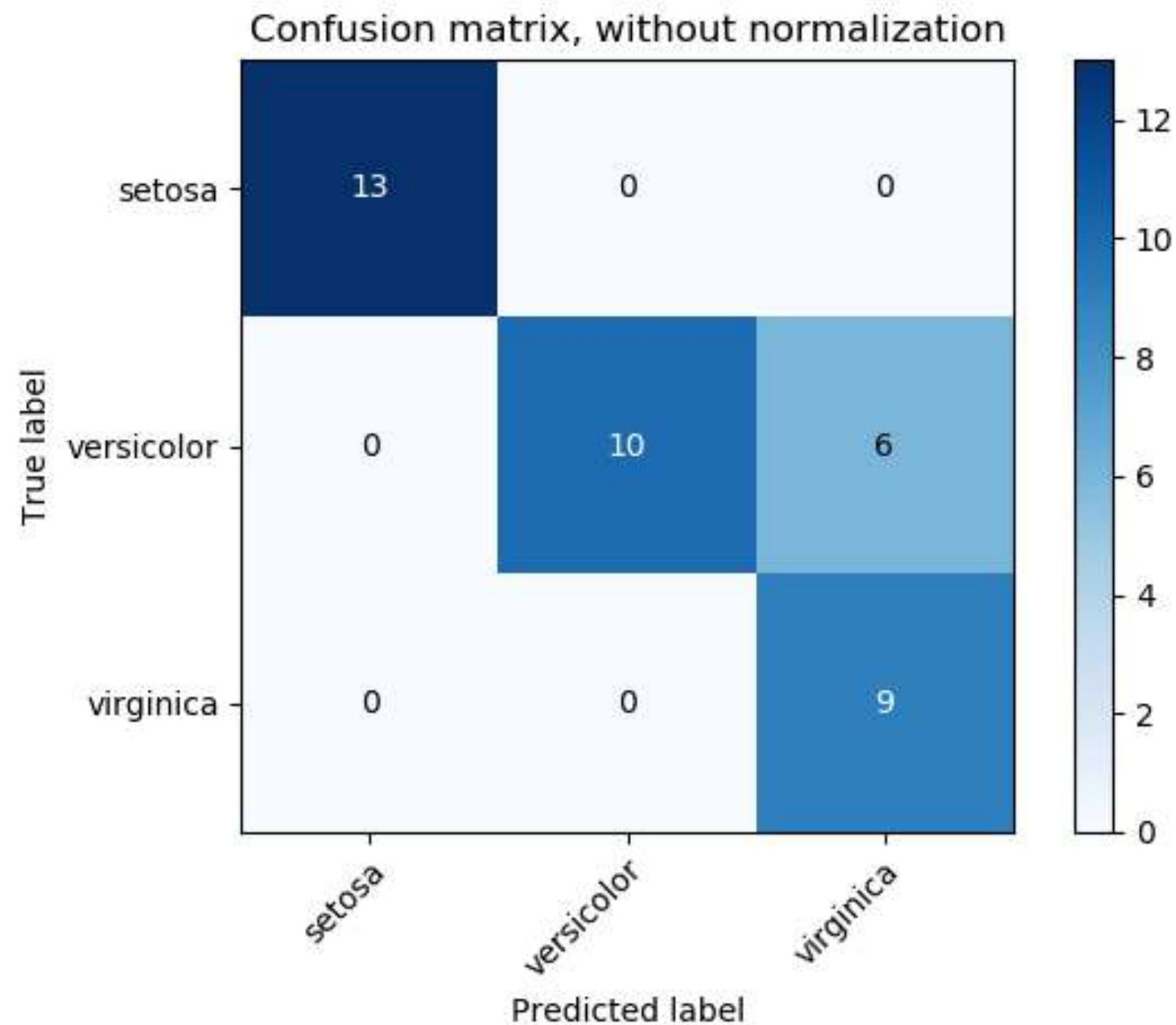
```
sns.lmplot(x="target_ht", y="preds", data=df_test, size=10, fit_reg=None)
```

/opt/conda/lib/python3.7/site-packages/seaborn/regression.py:546: UserWarning: The 'size' paramter h
warnings.warn(msg, UserWarning)

```
<seaborn.axisgrid.FacetGrid at 0x7f6f27b3e9b0>
```



Le Coeur du Projet : Evaluer



Advanced scoring metrics for the trained regression model

Here is the overall RMSE for these predictions:
283.5733137582963

Here is the average of the predictions:
917.9434641689575

Here is the average actual value on this validation set:
892.0494699646644

Here is the median prediction:
648.0062194016177

Here is the median actual value:
593.0

Here is the mean absolute error:
174.46048370173352

Here is the median absolute error (robust to outliers):
103.8421276930926

Here is the explained variance:
0.9046860437275243

Here is the R-squared value:
0.9038846235963717

Count of positive differences (prediction > actual):
163

Count of negative differences:
120

Average positive difference:
173.92735351964888

Average negative difference:
-175.18465219906508



"Trouve un moyen pour que
tes données soient nickel !"

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ARTIFICIAL
INTELLIGENCE
STUDY GROUP LEMANS

school of ai

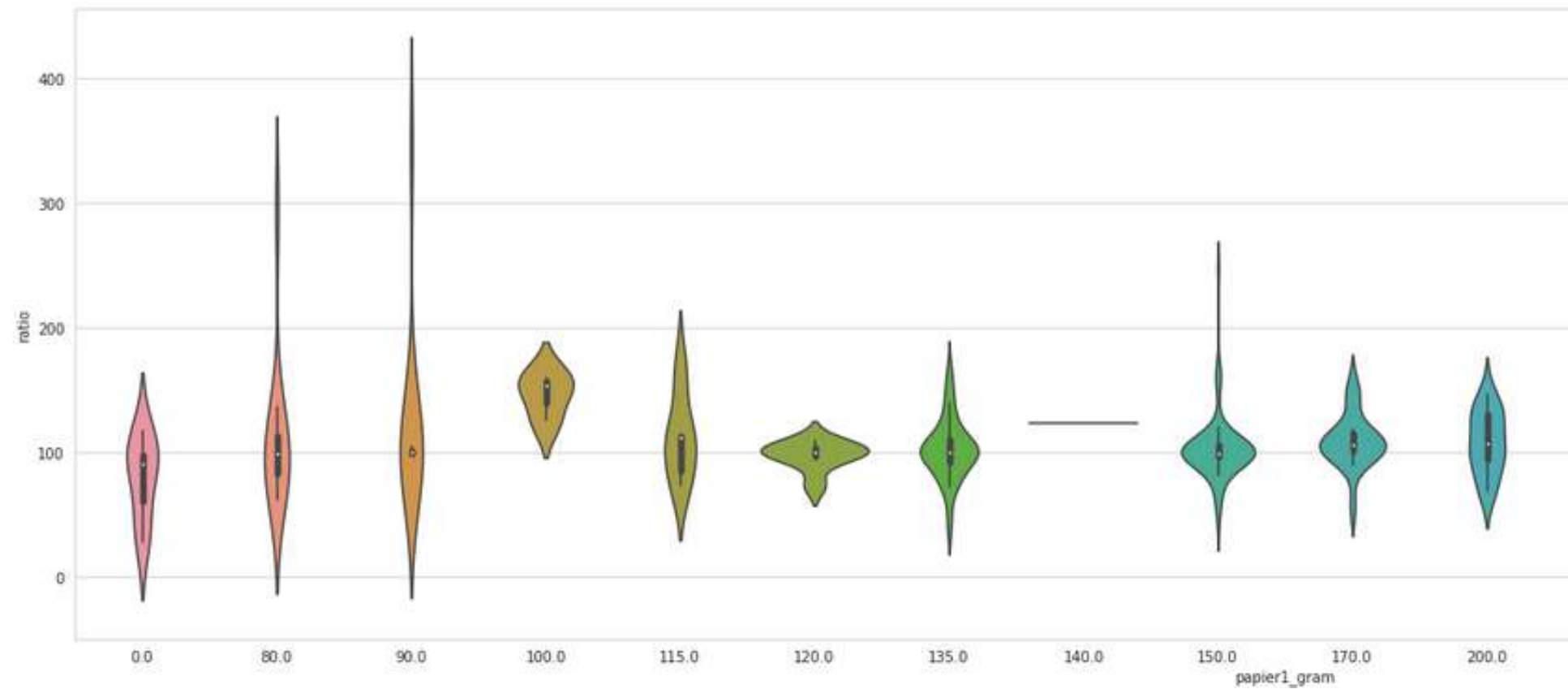
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La Valeur du Projet : Préparer les Données

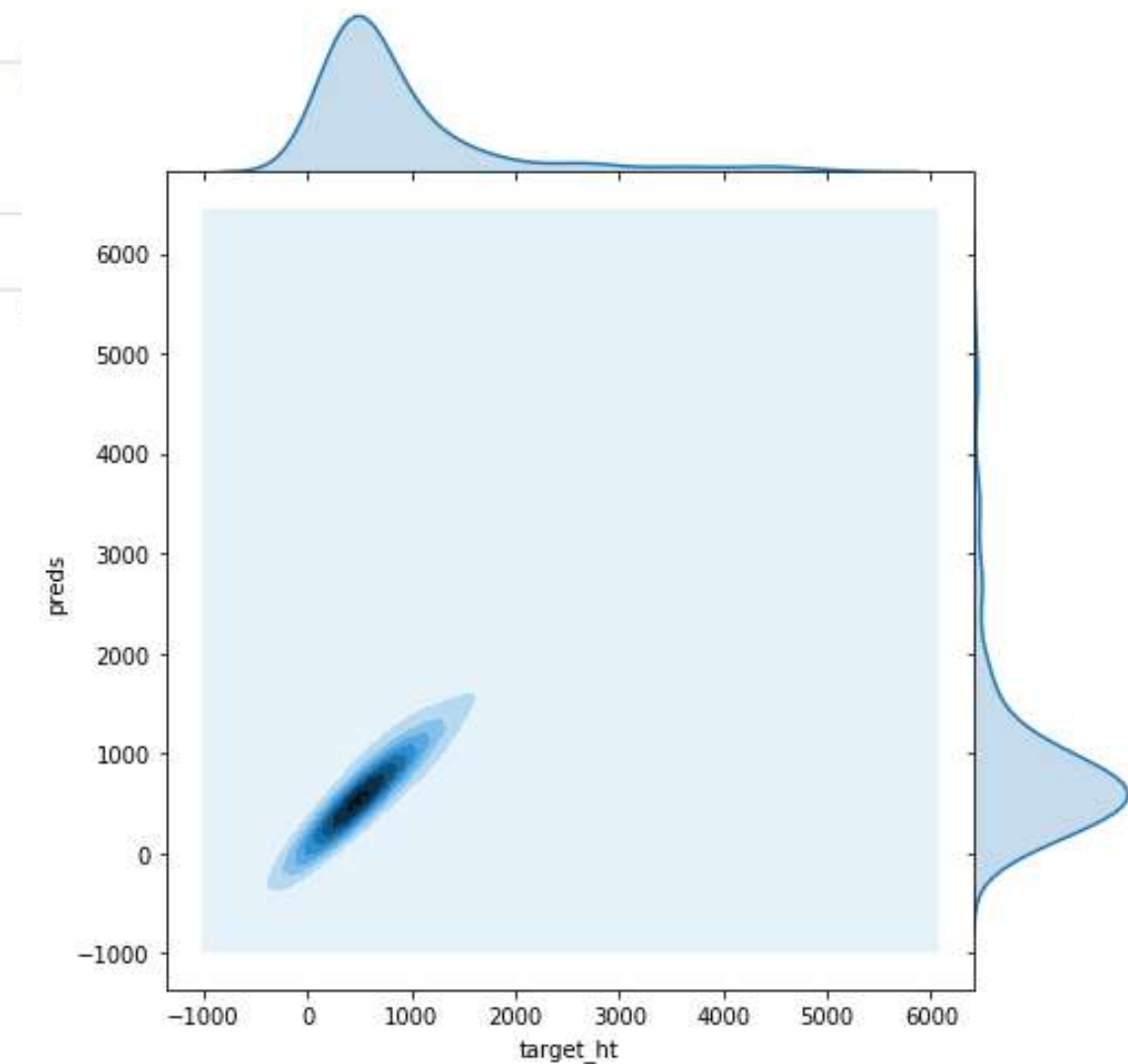
```
fig, ax = plt.subplots(figsize=(30,8))
sns.violinplot(ax=ax, x="papier1_gram", y="ratio", data=df_test)
```

<matplotlib.axes._subplots.AxesSubplot at 0x7ff660d63d30>



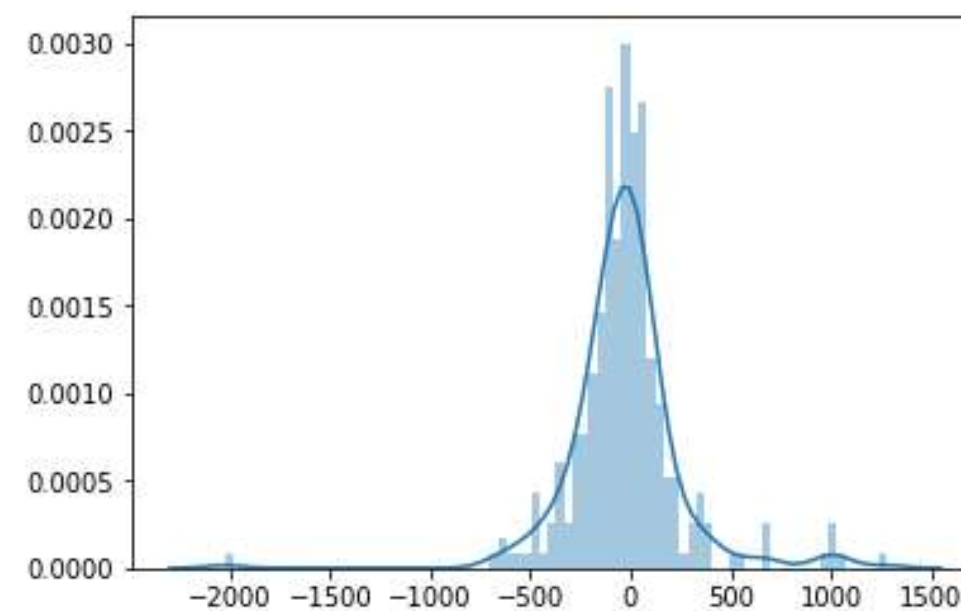
```
sns.jointplot(df_test.target_ht, df_test.preds, kind="kde", height=7, space=0)
```

<seaborn.axisgrid.JointGrid at 0x7f6f285c0860>



```
sns.distplot((df_test.target_ht-df_test.preds),bins=80)
```

<matplotlib.axes._subplots.AxesSubplot at 0x7f6f279d8978>



La Valeur du Projet : Préparer les Données

```
df[['papier1_papier']].head(20)
```

	papier1_papier
0	aucun
1	aucun
2	couche demi mat
3	couche demi mat
4	couche demi mat
5	couche demi mat
6	couche demi mat 2f
7	couche demi mat 2f
8	couche demi mat 2f
9	couche demi mat 2f
10	couche demi mat 2f
11	couche demi mat 2f
12	couche demi mat 2f
13	couche demi mat 2f
14	couche demi mat 2f
15	couche demi mat 2f
16	couche demi mat 2f
17	couche demi mat 2f
18	couche demi mat 2f
19	aucun



```
pd.get_dummies(df[['papier1_papier']].head(20))
```

	papier1_papier_aucun	papier1_papier_couche demi mat	papier1_papier_couche demi mat 2f
0	1	0	0
1	1	0	0
2	0	1	0
3	0	1	0
4	0	1	0
5	0	1	0
6	0	0	1
7	0	0	1
8	0	0	1
9	0	0	1
10	0	0	1
11	0	0	1
12	0	0	1
13	0	0	1
14	0	0	1
15	0	0	1
16	0	0	1
17	0	0	1
18	0	0	1
19	1	0	0

La Valeur du Projet : Préparer les Données

```
from sklearn.preprocessing import StandardScaler  
scaler = StandardScaler()  
df_scaled = pd.DataFrame(scaler.fit_transform(df[['surface', 'len_papiers', 'qte']]), columns=['surface', 'len_papiers', 'qte'])
```

```
df[['surface', 'len_papiers', 'qte']].head(10)
```

	surface	len_papiers	qte
0	31080.0	0	1200
1	31080.0	0	1200
2	124740.0	1	50
3	124740.0	1	50
4	124740.0	1	50
5	186850.0	1	500
6	31500.0	1	370000
7	31500.0	1	180000
8	31500.0	1	100000
9	31500.0	1	370000



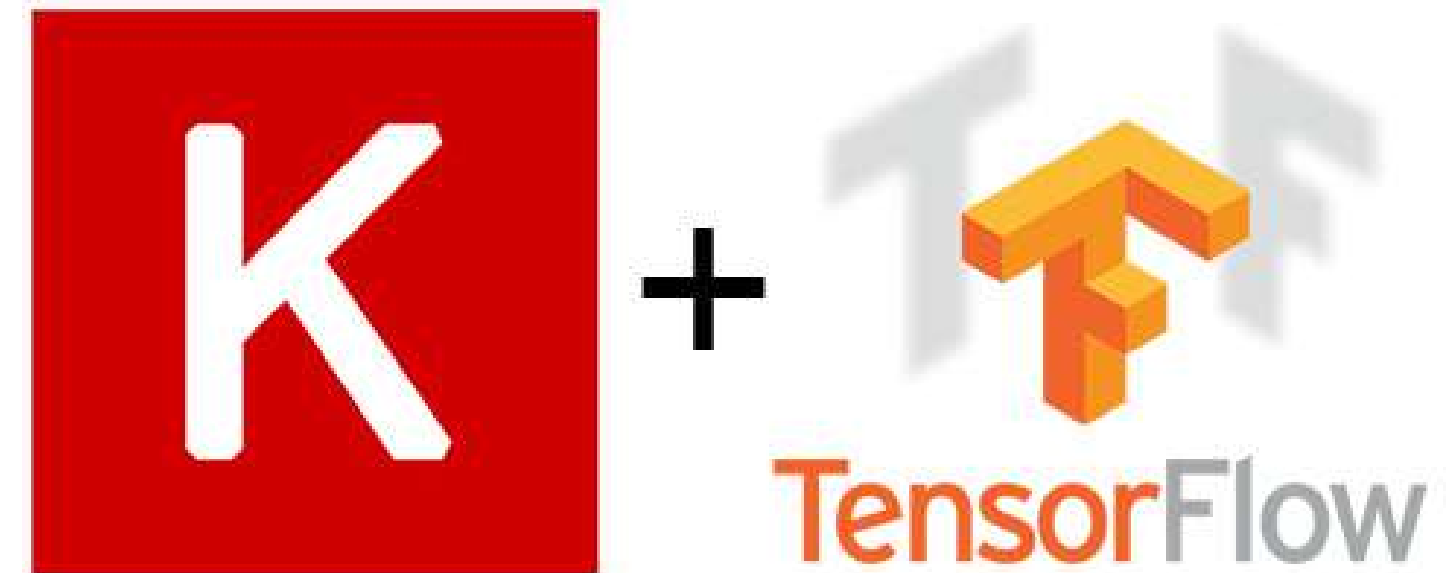
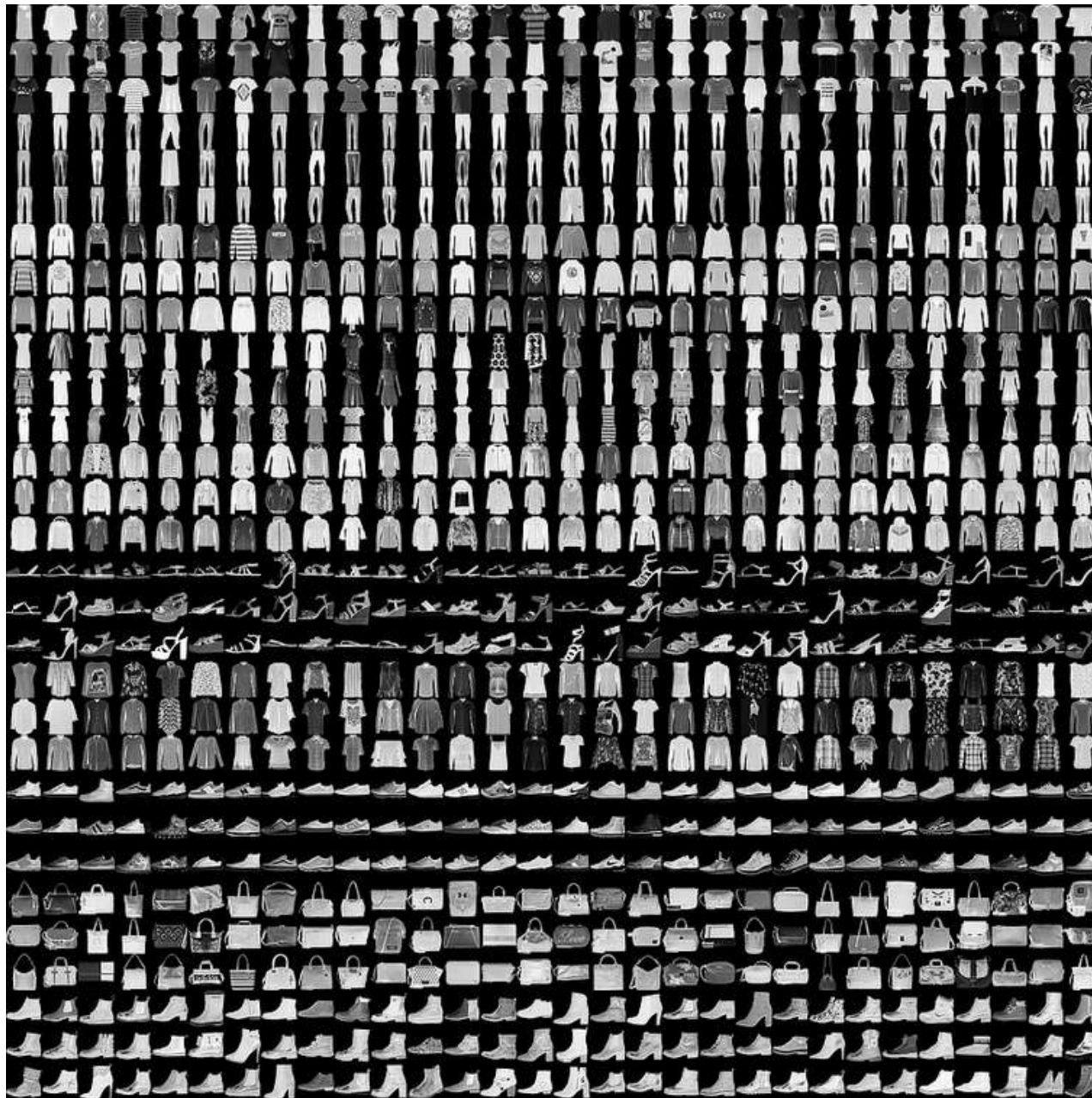
```
df_scaled.head(10)
```

	surface	len_papiers	qte
0	-1.015639	-3.470085	-0.203555
1	-1.015639	-3.470085	-0.203555
2	-0.600761	-0.196901	-0.220061
3	-0.600761	-0.196901	-0.220061
4	-0.600761	-0.196901	-0.220061
5	-0.325638	-0.196901	-0.213602
6	-1.013779	-0.196901	5.089938
7	-1.013779	-0.196901	2.362813
8	-1.013779	-0.196901	1.214550
9	-1.013779	-0.196901	5.089938





Fashion MNIST Classification Hands-On!



https://github.com/IALeMans/Fashion_MNIST_Classification