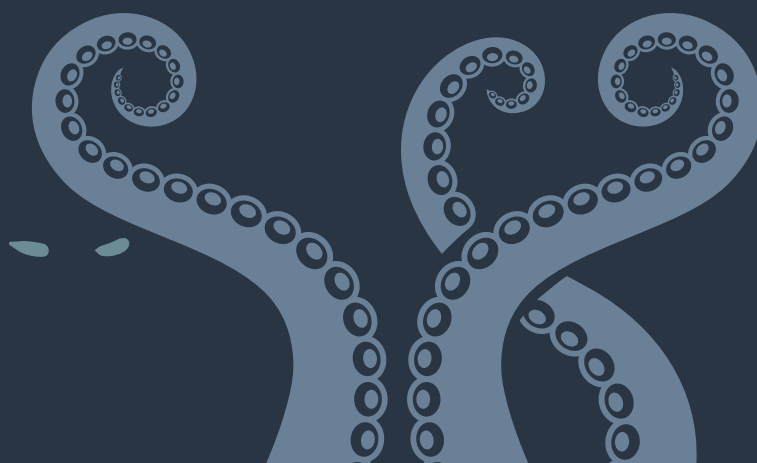


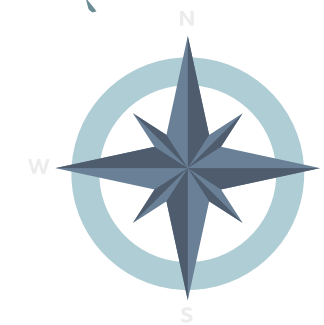
SI ON AIDAIT LE CAPITAINE NÉMO À CLASSIFIER LES MONSTRES MARINS ?

Eléa Petton & Stéphane Philippart
@EleaPetton & @wildagsx





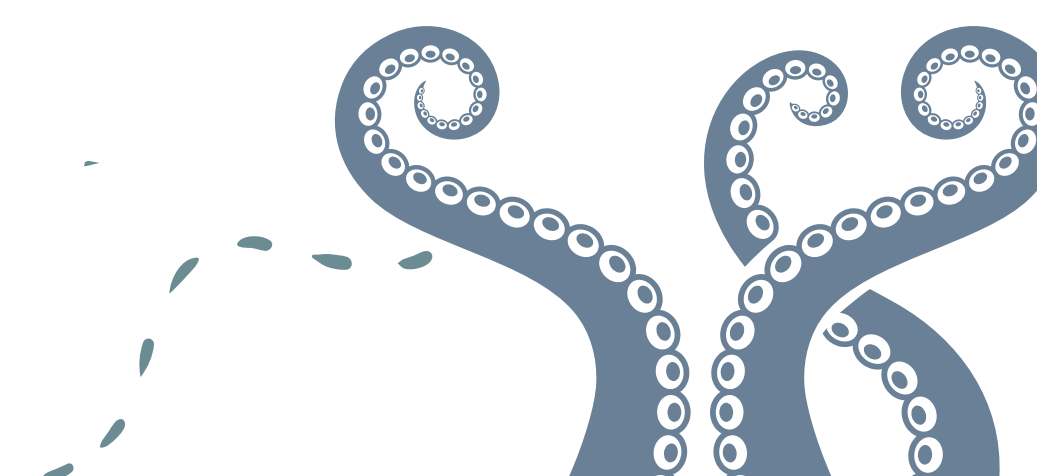
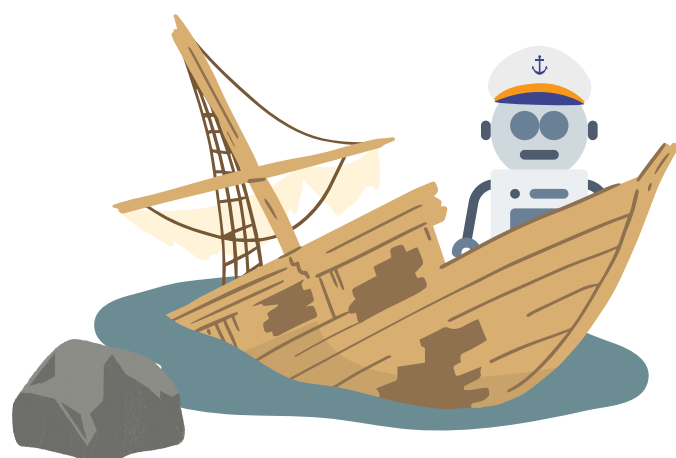
Merci à nos sponsors



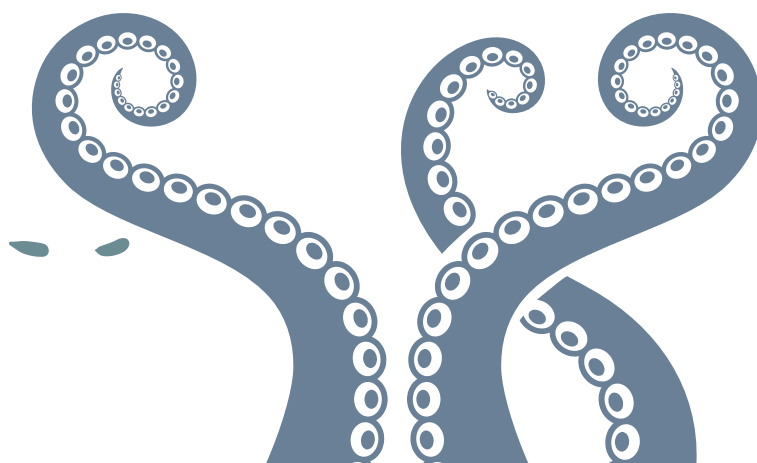
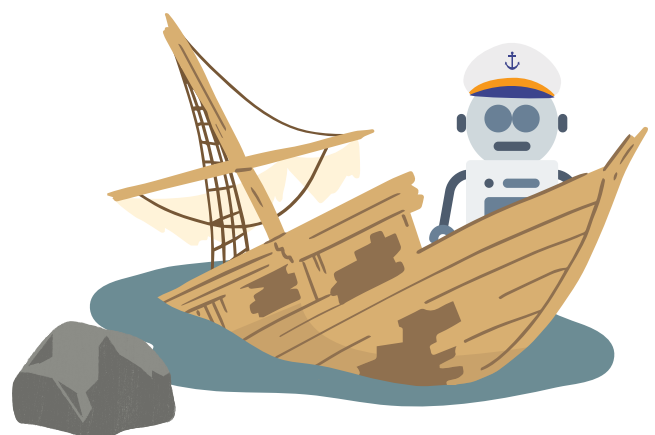
« Etoile »



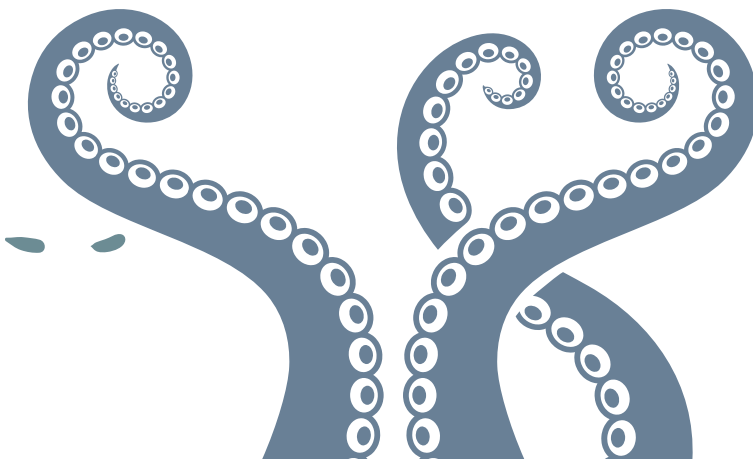
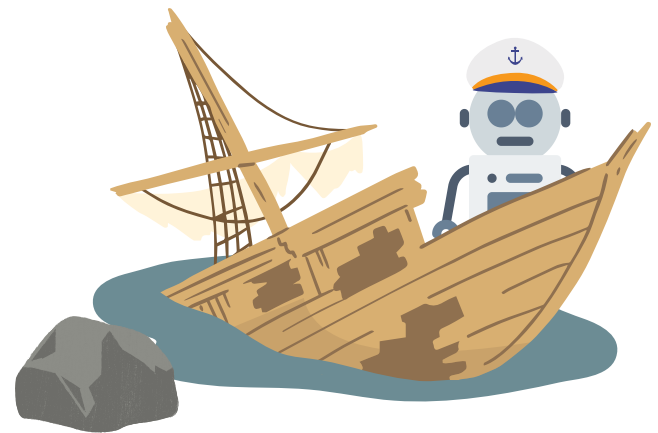
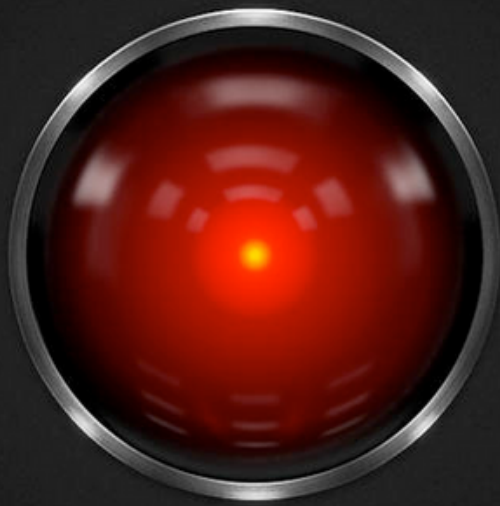
« Flocon »

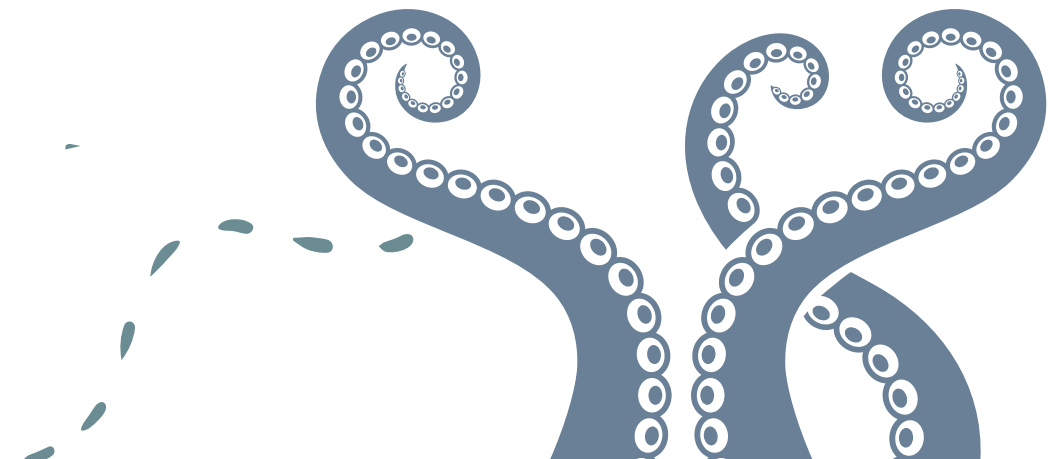
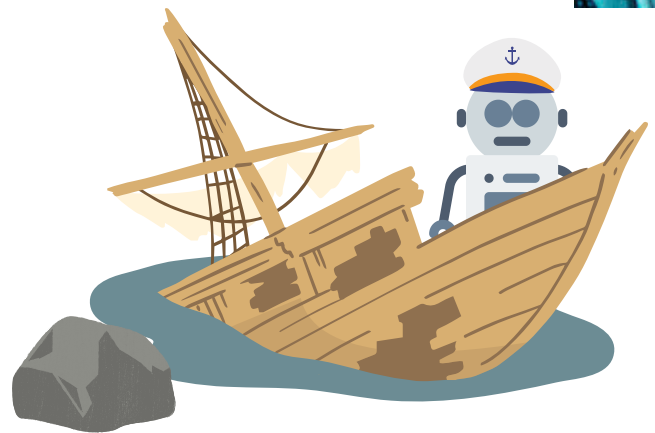
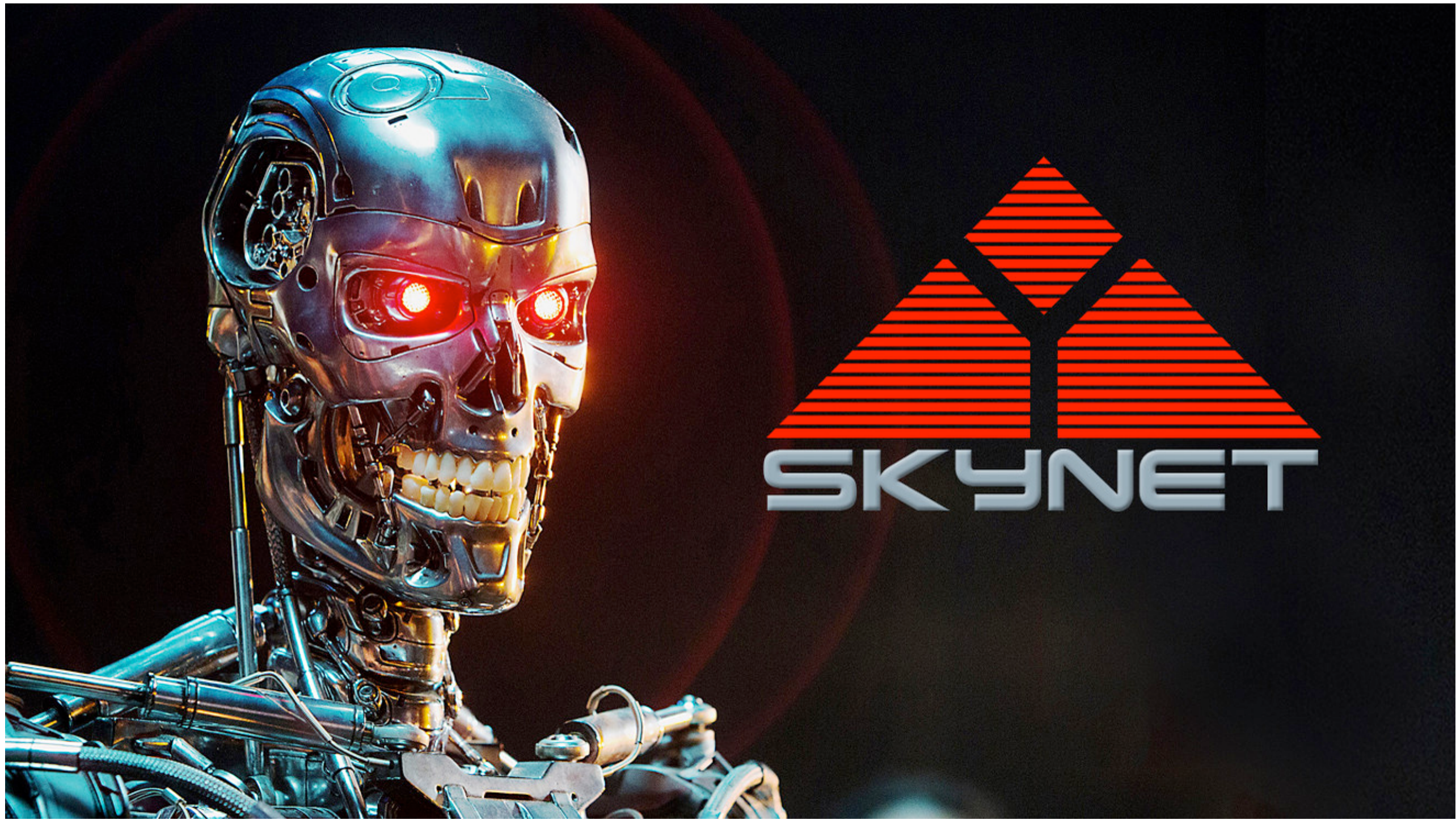


MAIS L'INTELLIGENCE ARTIFICIELLE C'EST QUOI AU FINAL ?



HAL 9000



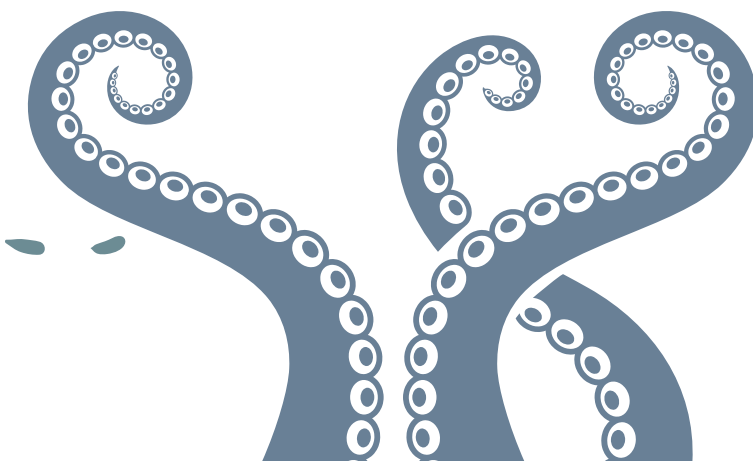


QU'EST-CE QUE L'IA ?

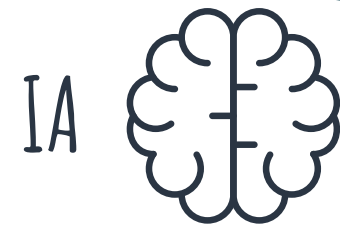
Toi humain tu sais différencier les animaux marins.

Comment faire pour l'apprendre ?

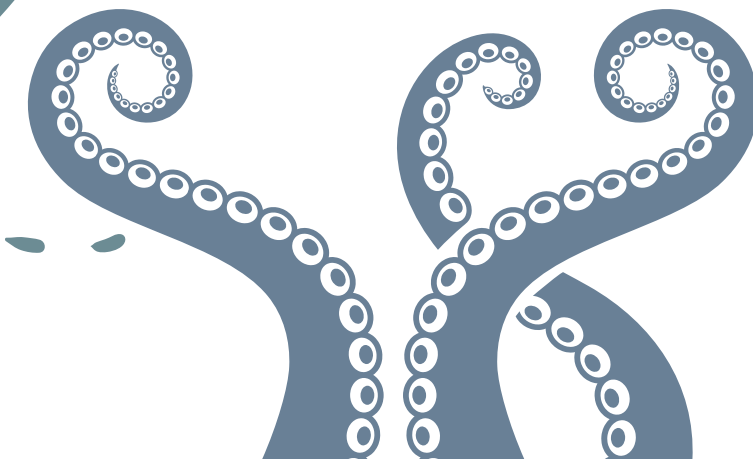
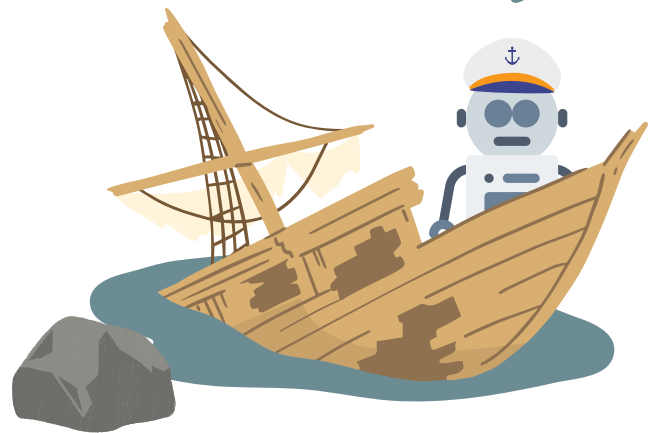
Attends, je vais te donner un algorithme qui va te permettre d'apprendre.



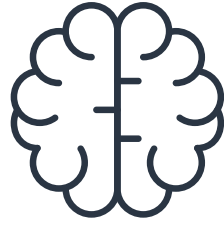
QU'EST-CE QUE L'IA ?



Je me demande
quelle est la
différence entre
tous ces termes ?

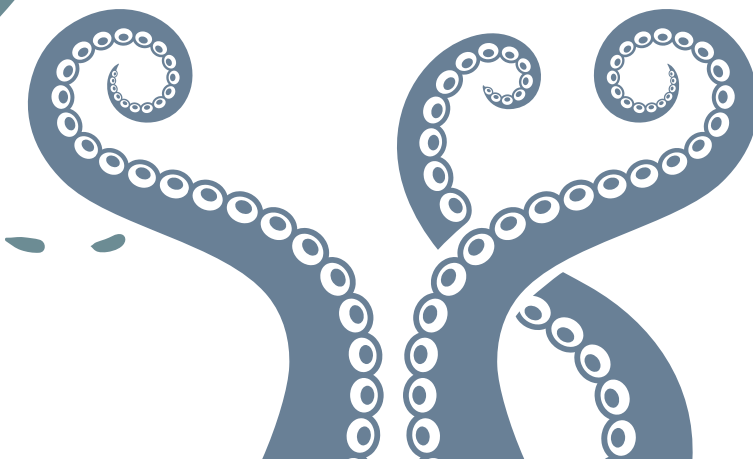
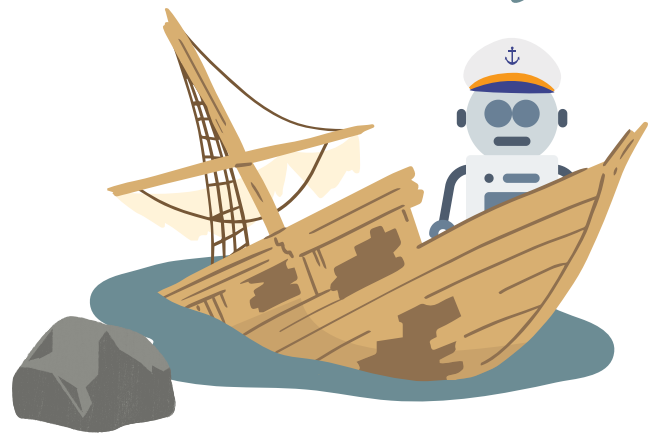


QU'EST-CE QUE L'IA ?

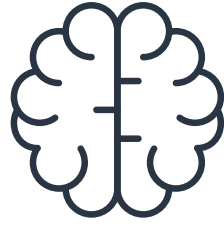
IA 

MACHINE
LEARNING 

Je me demande
quelle est la
différence entre
tous ces termes ?



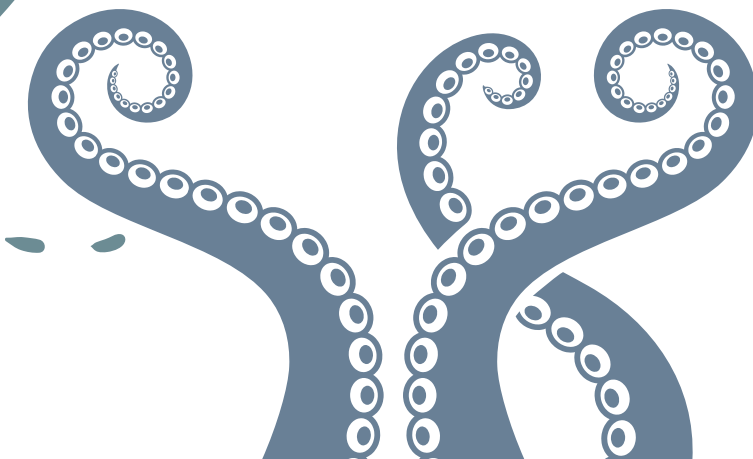
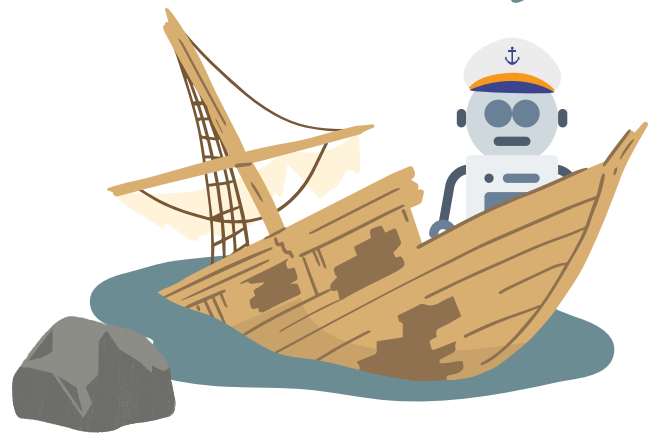
QU'EST-CE QUE L'IA ?

IA 

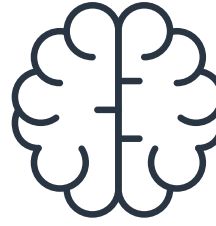
MACHINE
LEARNING 

RÉSEAUX DE
NEURONES 

Je me demande
quelle est la
différence entre
tous ces termes ?



QU'EST-CE QUE L'IA ?

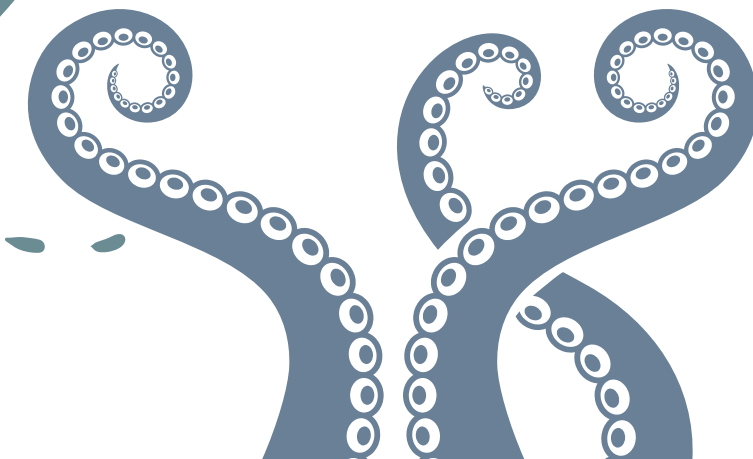
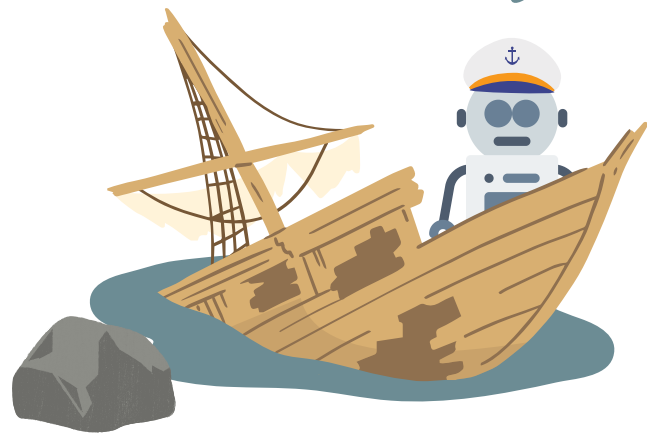
IA 

MACHINE
LEARNING 

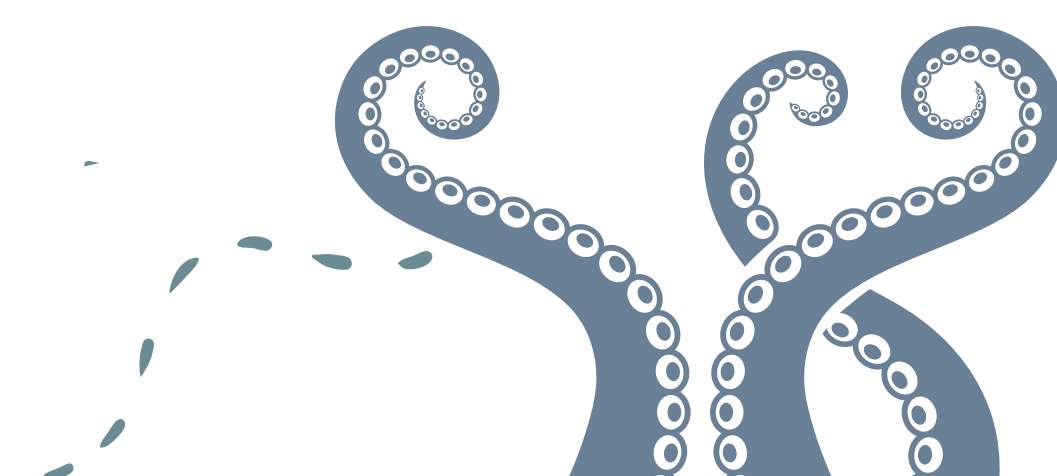
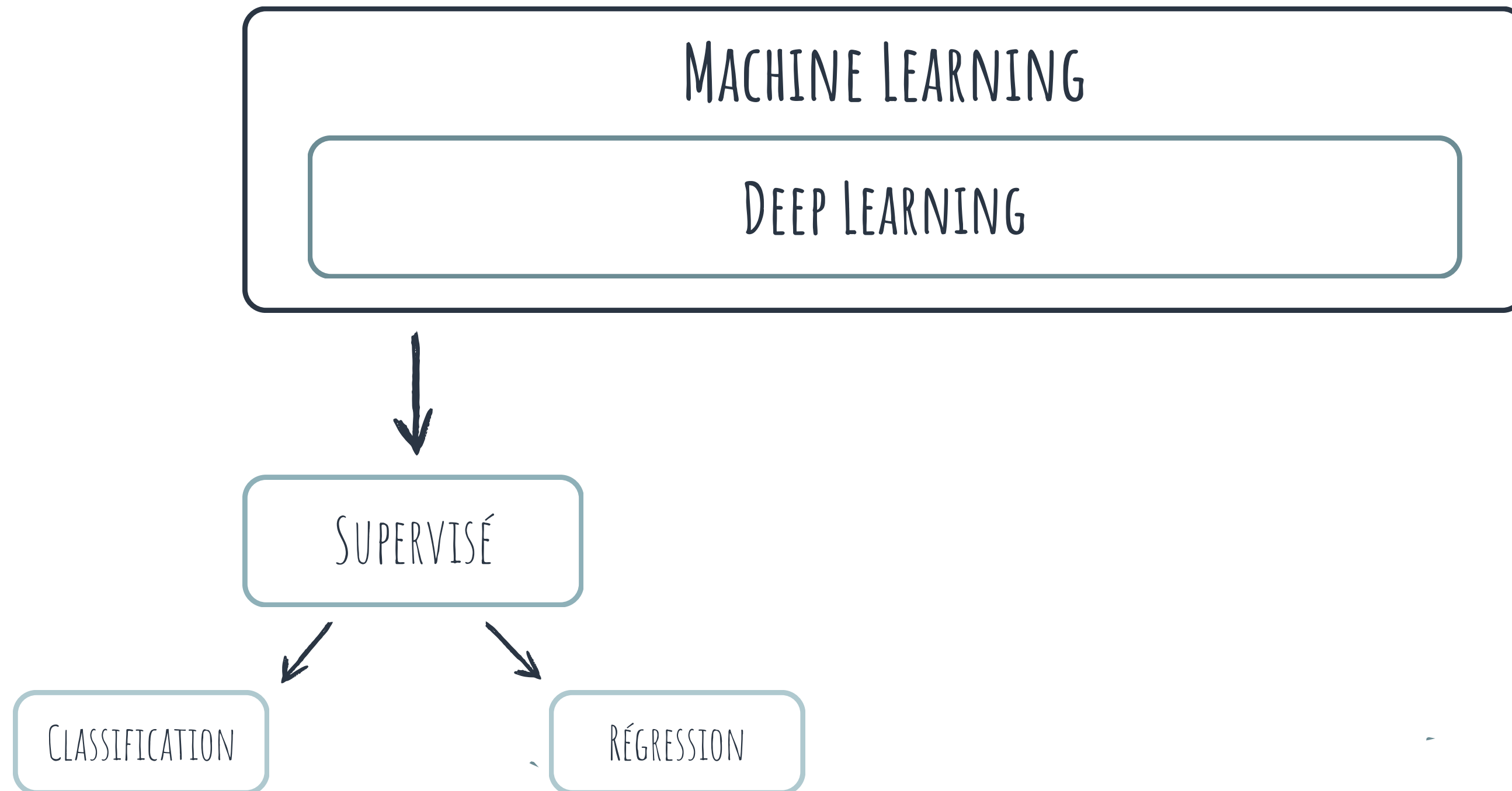
RÉSEAUX DE
NEURONES 

DEEP
LEARNING 

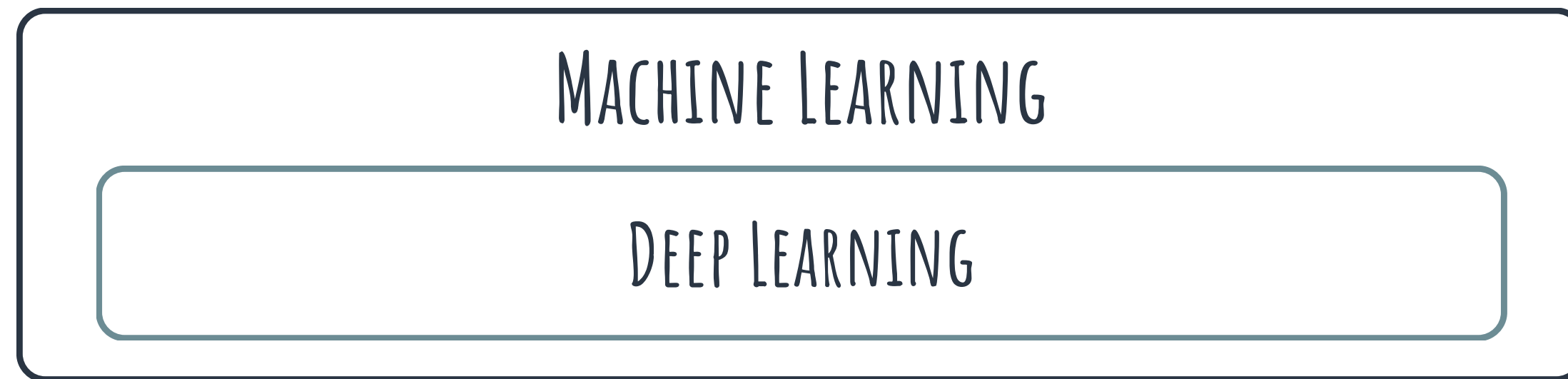
Je me demande
quelle est la
différence entre
tous ces termes ?



LE MACHINE LEARNING PLUS EN DÉTAIL



LE MACHINE LEARNING PLUS EN DÉTAIL

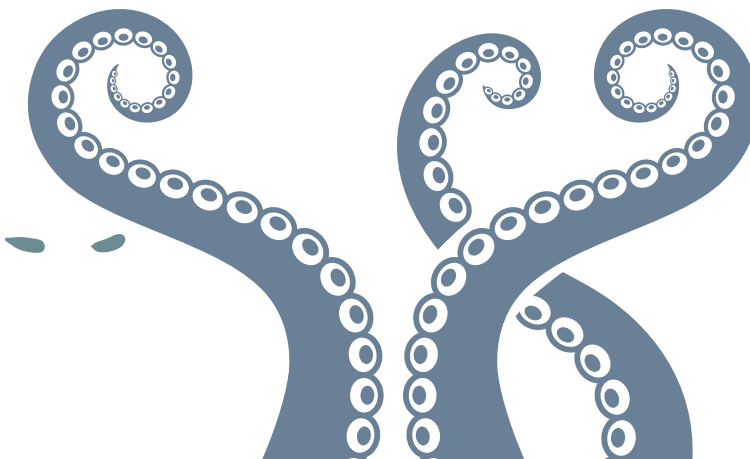


NON SUPERVISÉ

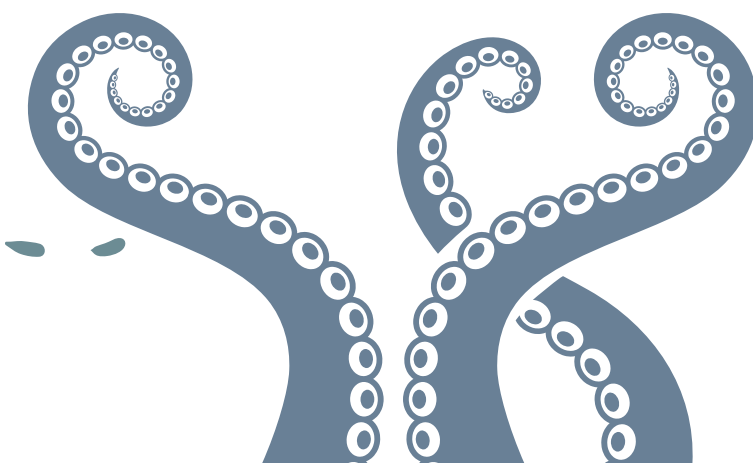
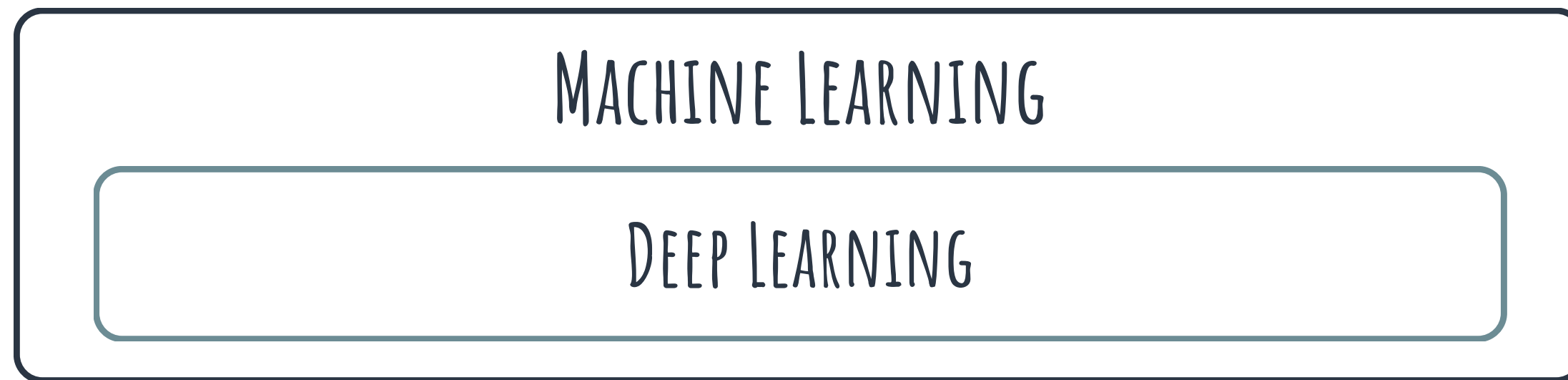


CLUSTERING

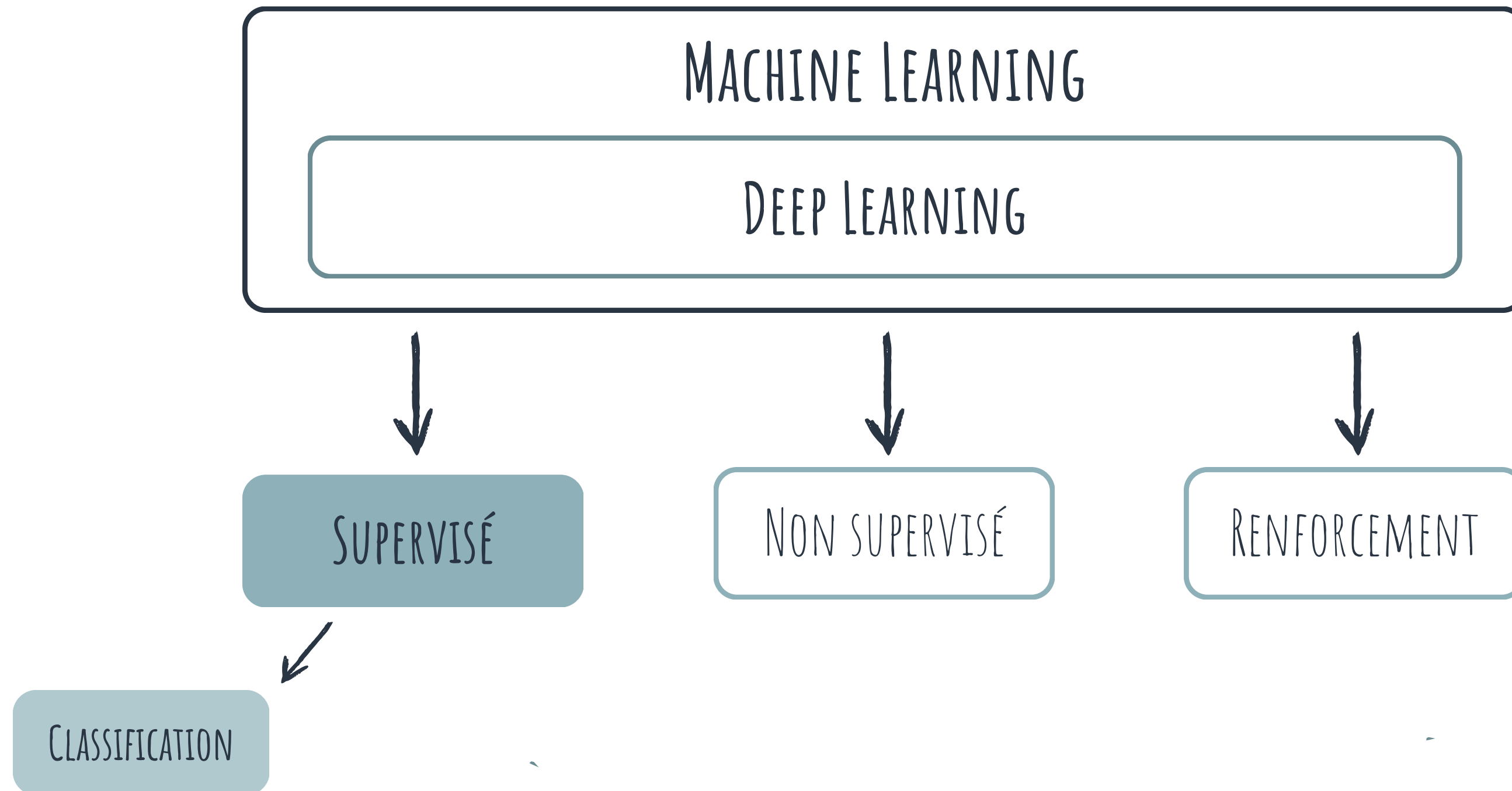
RÉDUCTION DE DIMENSION



LE MACHINE LEARNING PLUS EN DÉTAIL



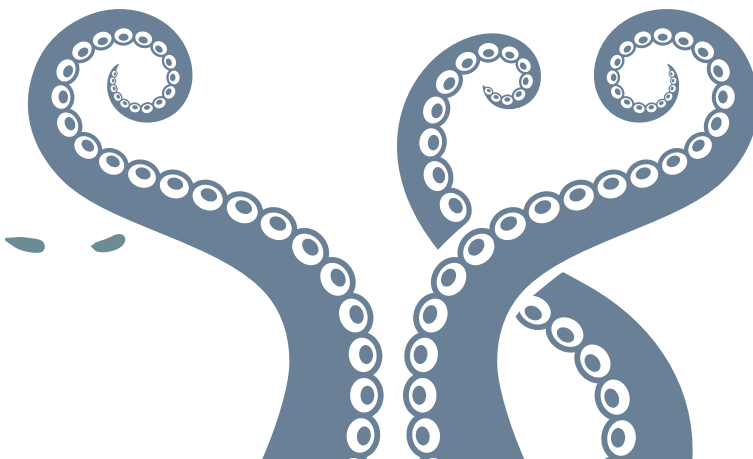
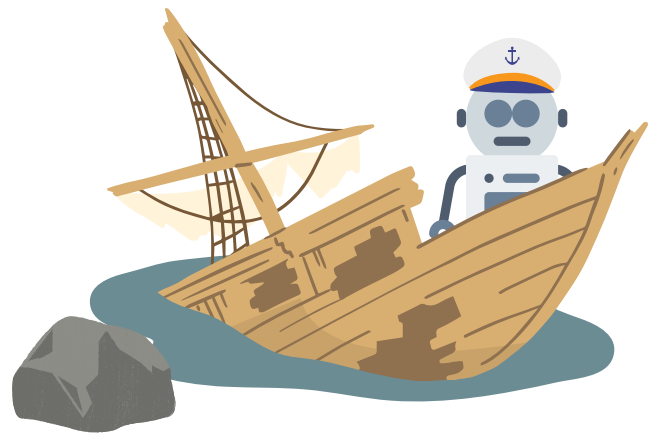
LE MACHINE LEARNING PLUS EN DÉTAIL



DIFFÉRENTES FAMILLES EN IA



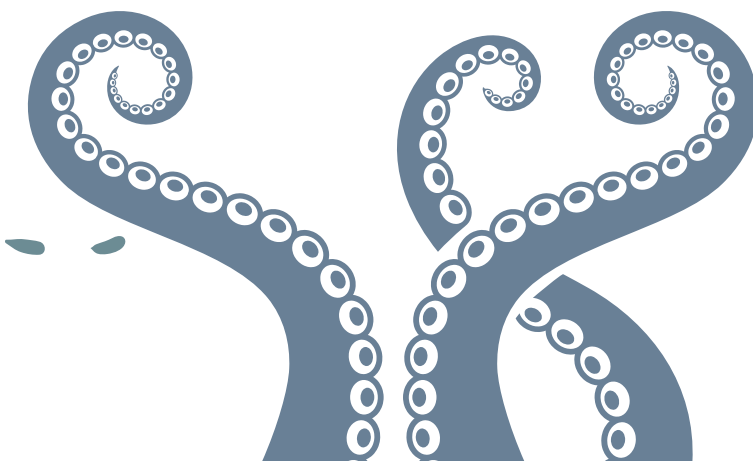
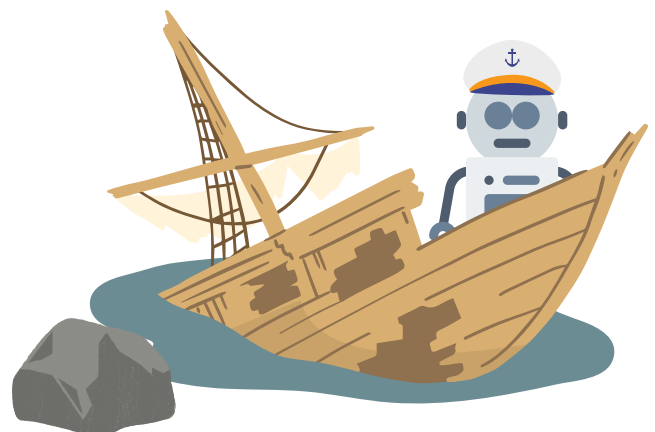
NLP



LE NLP, À QUOI ÇA SERT ?



Traduction



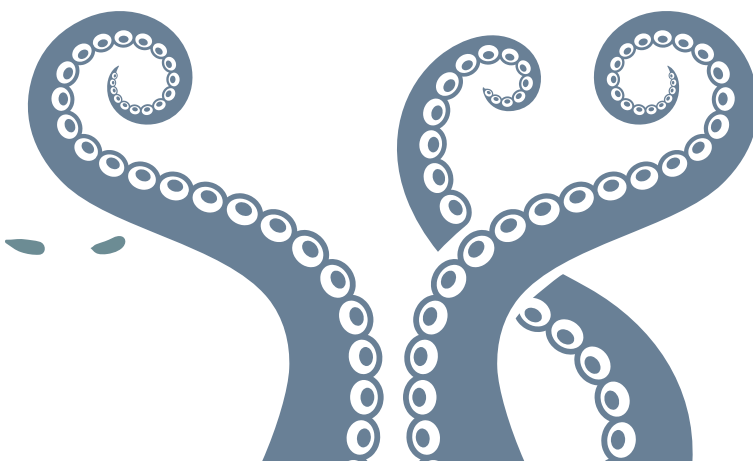
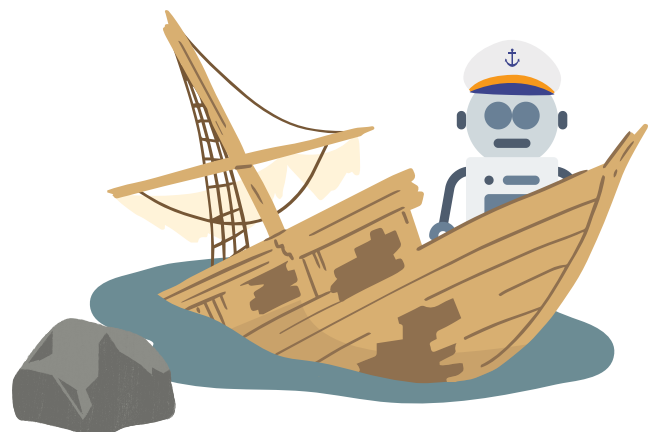
LE NLP, À QUOI ÇA SERT ?



Traduction



Classification de texte



LE NLP, À QUOI ÇA SERT ?



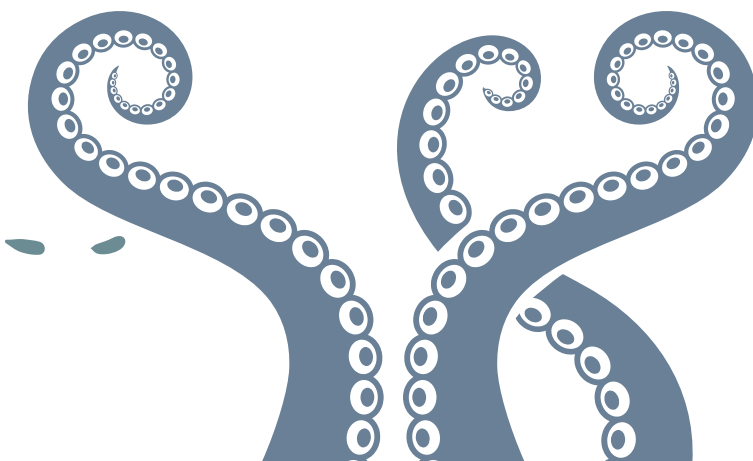
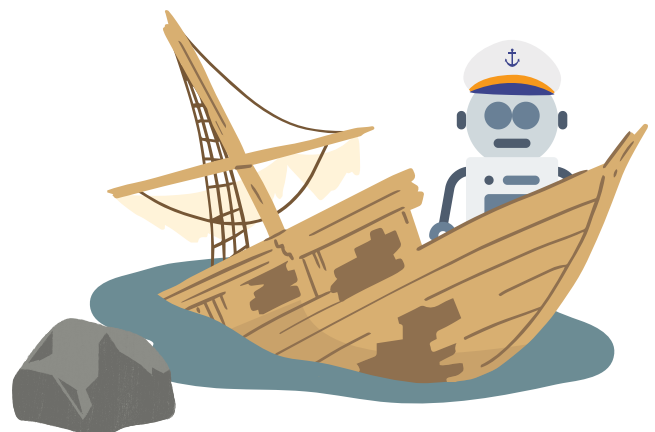
Traduction



Classification de texte



Résumés



LE NLP, À QUOI ÇA SERT ?



Traduction



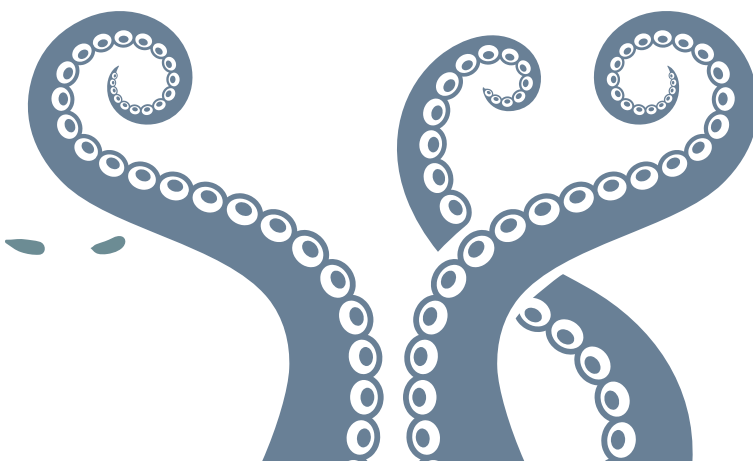
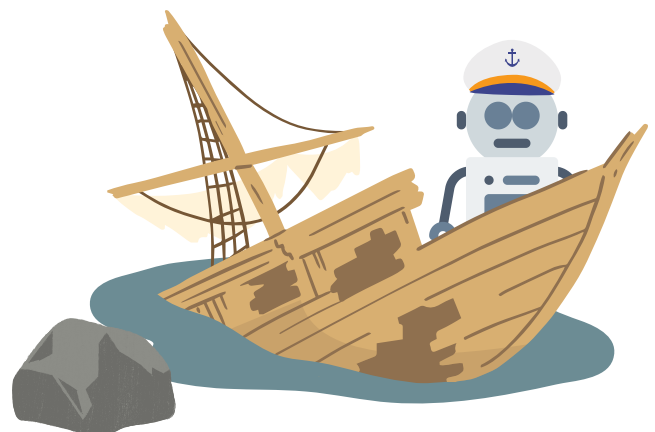
Classification de texte



Résumés



Génération de texte



LE NLP, À QUOI ÇA SERT ?



Traduction



Classification de texte



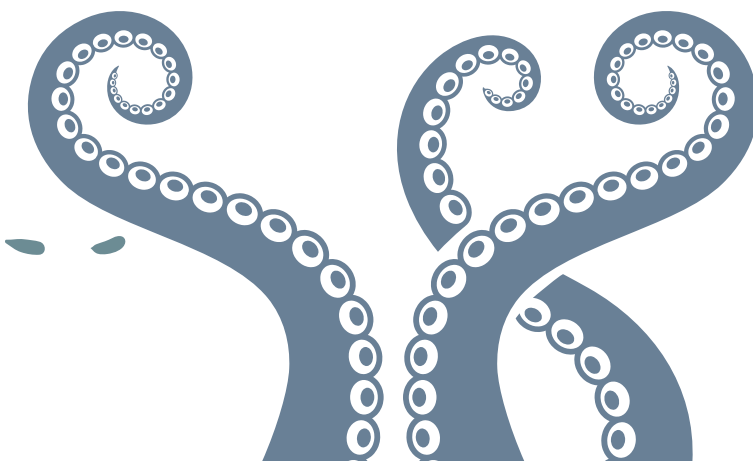
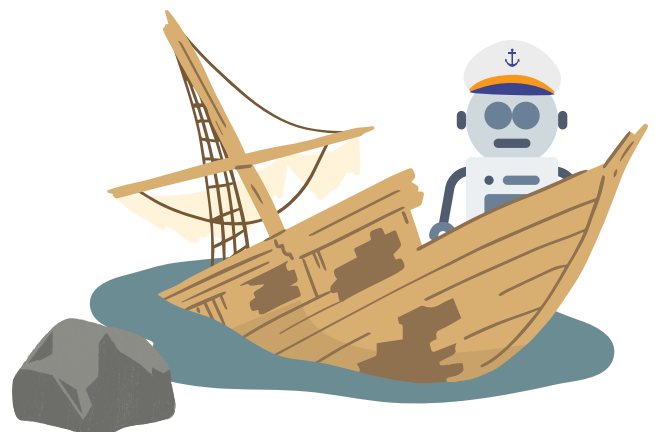
Résumés



Génération de texte



Réponses à des questions



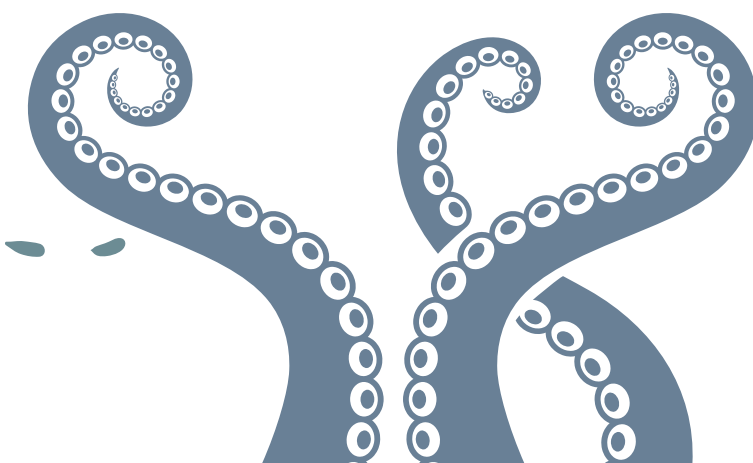
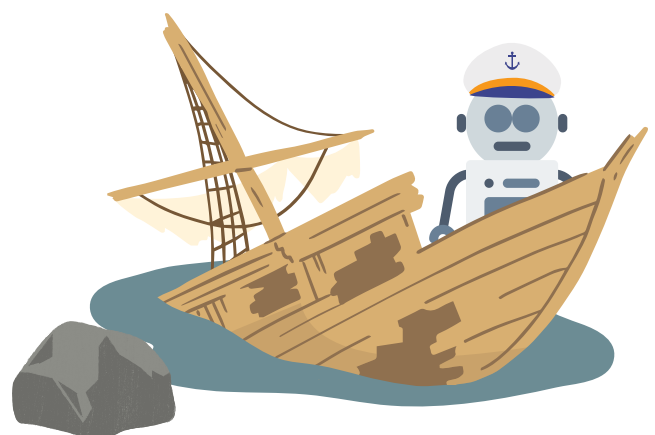
DIFFÉRENTES FAMILLES EN IA



NLP



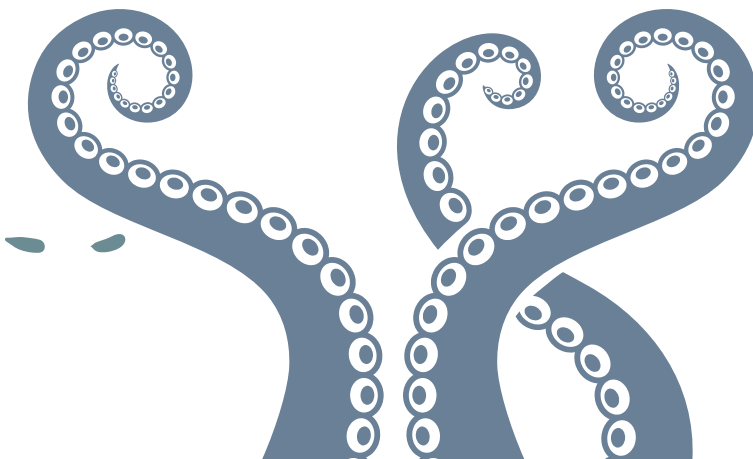
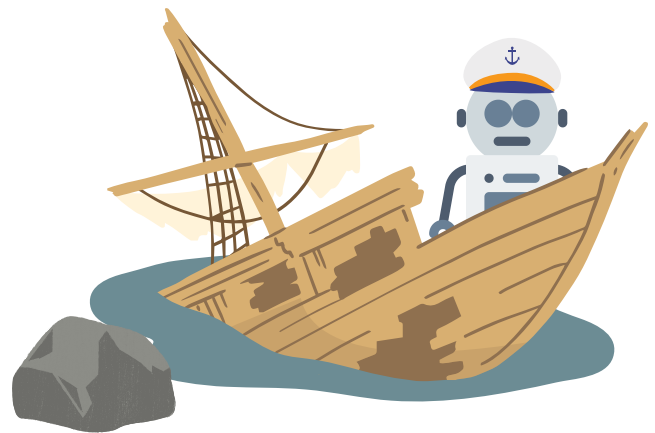
Computer Vision



LA COMPUTER VISION, C'EST QUOI ?



Classification d'images



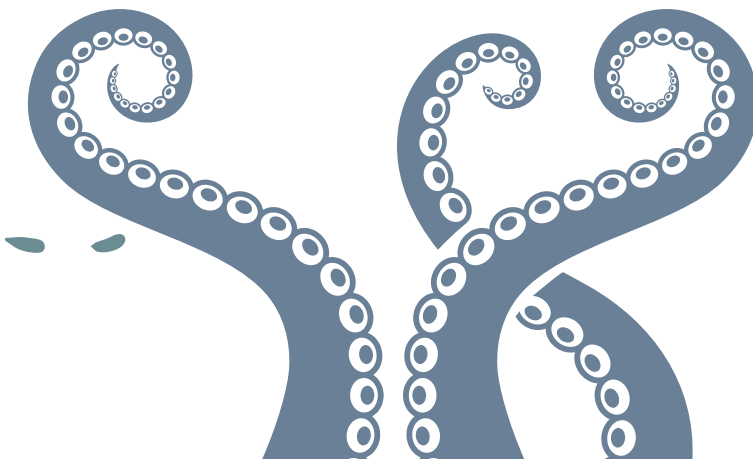
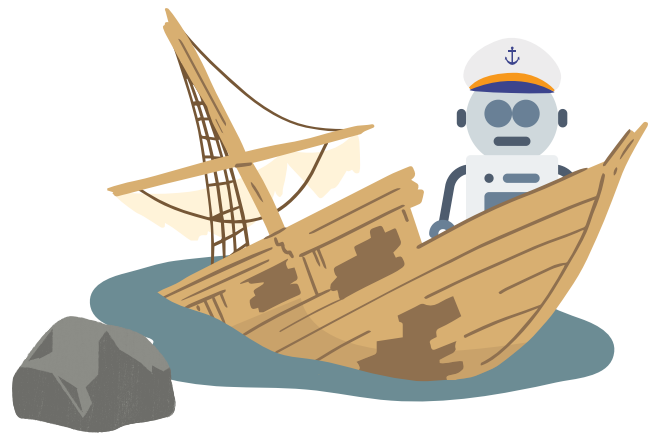
LA COMPUTER VISION, C'EST QUOI ?



Classification d'images



Détection d'objets



LA COMPUTER VISION, C'EST QUOI ?



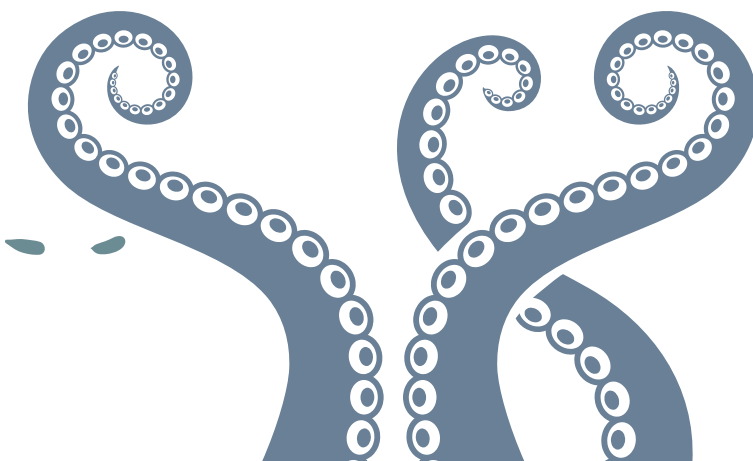
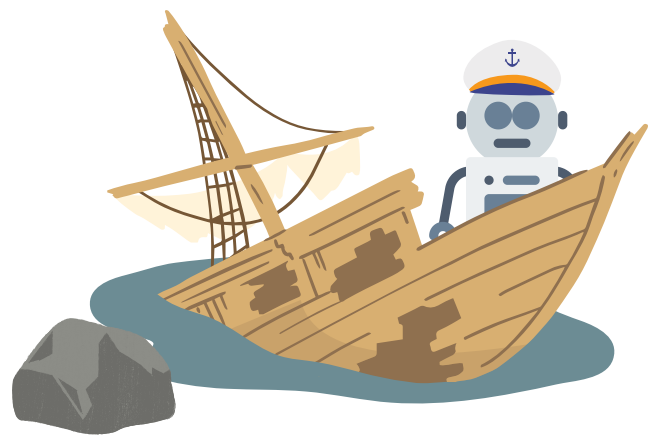
Classification d'images



Détection d'objets



Segmentation d'images



LA COMPUTER VISION, C'EST QUOI ?

Classification



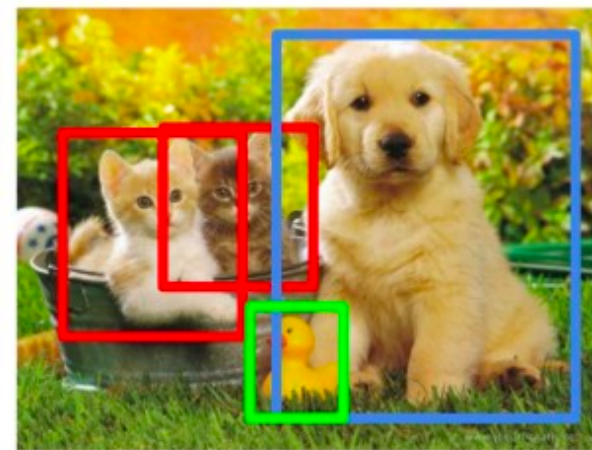
CAT

**Classification
+ Localization**



CAT

Object Detection



CAT, DOG, DUCK

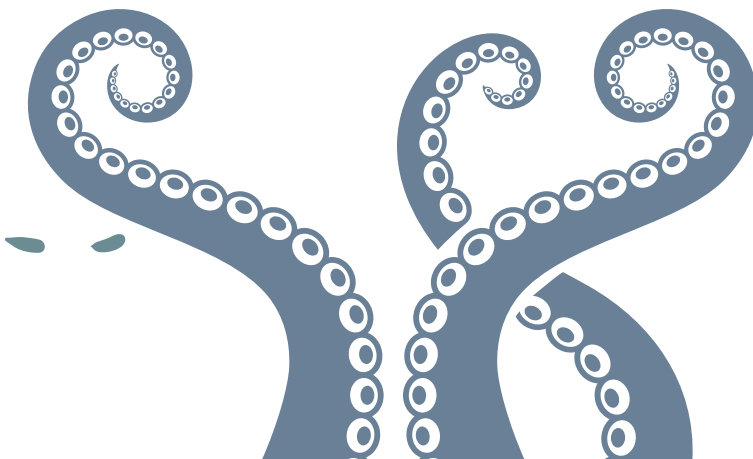
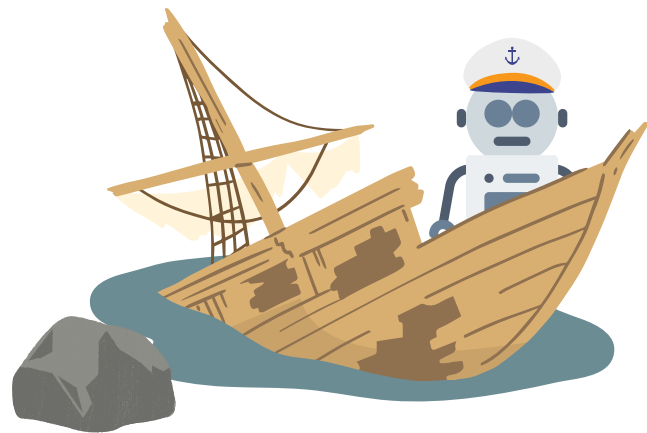
**Instance
Segmentation**



CAT, DOG, DUCK

Single object

Multiple objects



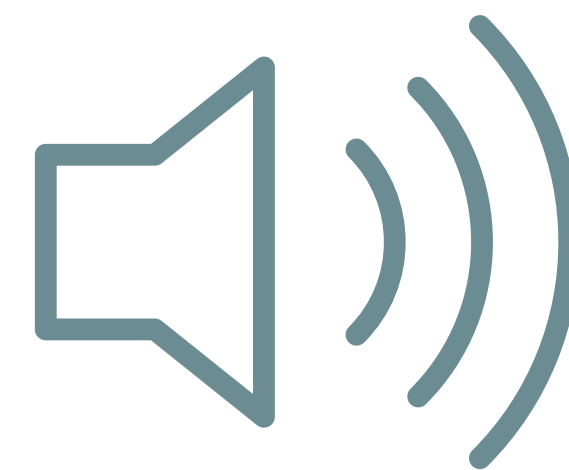
DIFFÉRENTES FAMILLES EN IA



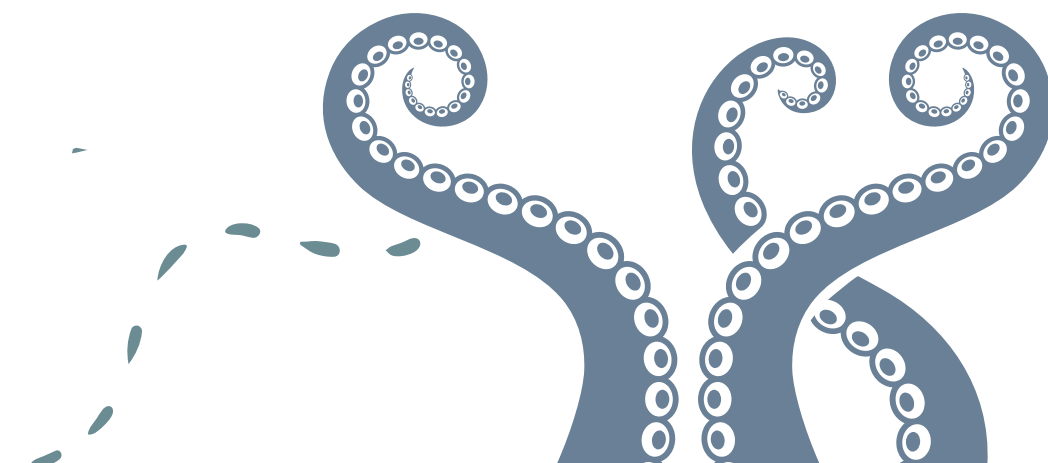
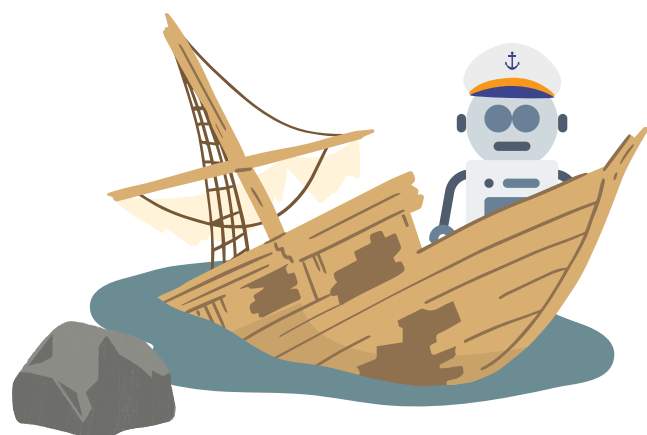
NLP



Computer Vision



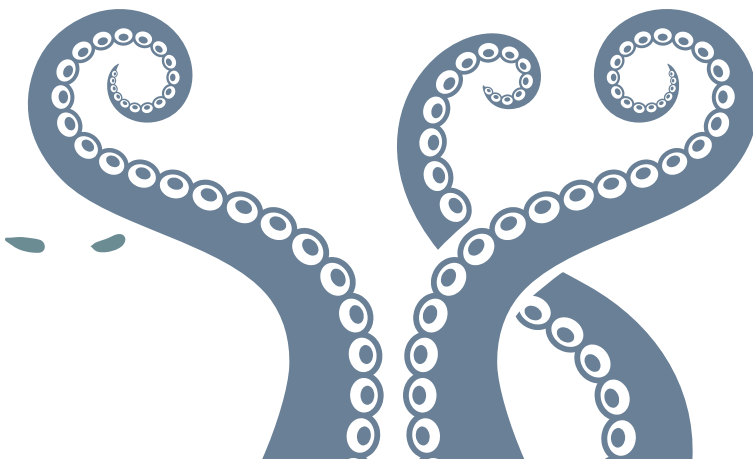
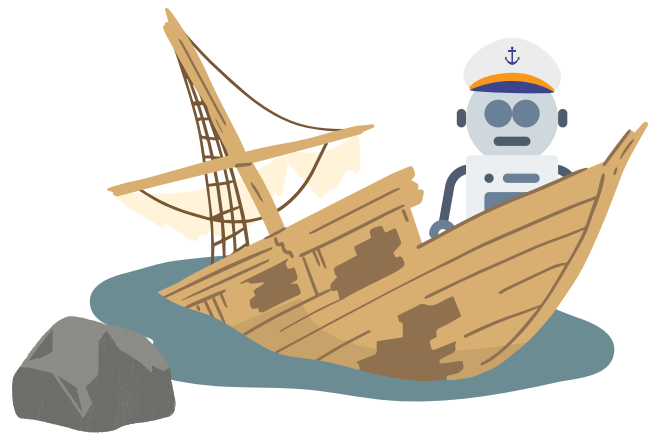
Audio



POURQUOI LE SON EN IA ?



Classification des données acoustiques



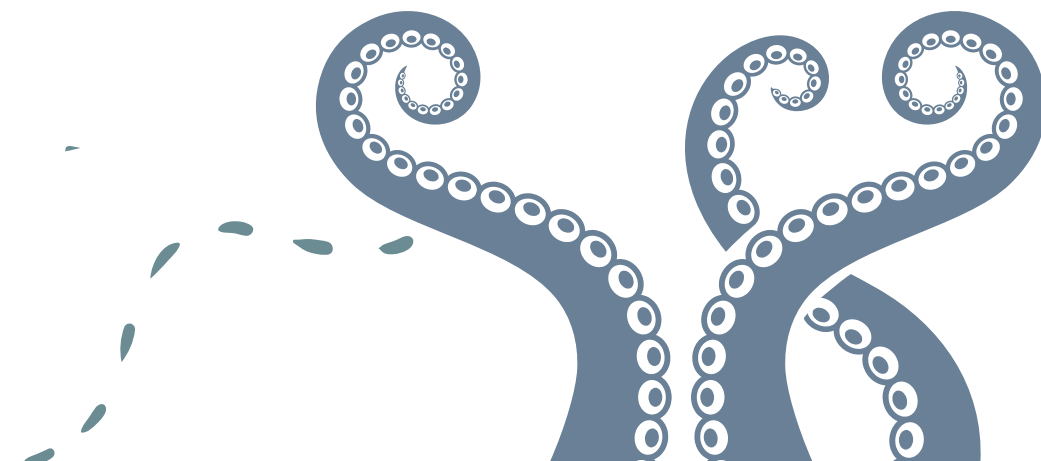
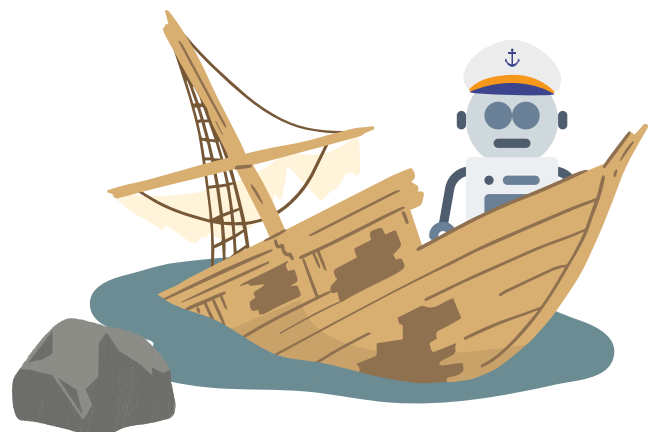
POURQUOI LE SON EN IA ?



Classification des données acoustiques



Classification des sons environnementaux



POURQUOI LE SON EN IA ?



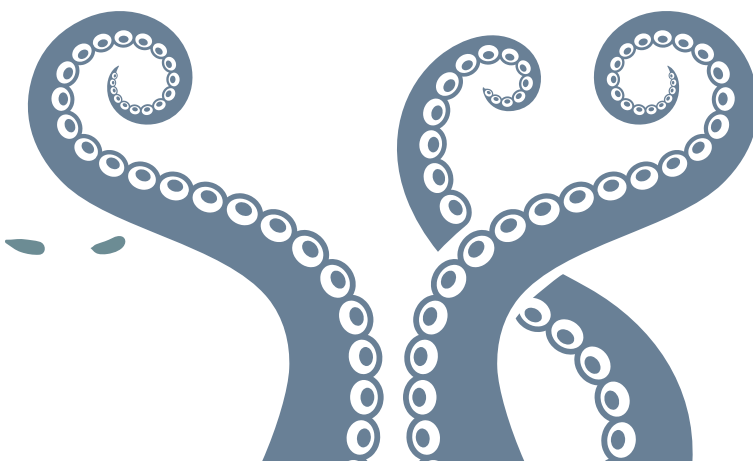
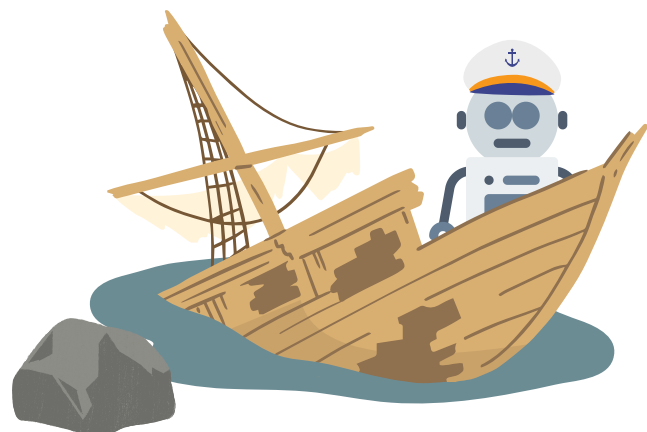
Classification des données acoustiques



Classification des sons environnementaux



Classification du langage naturel



POURQUOI LE SON EN IA ?



Classification des données acoustiques



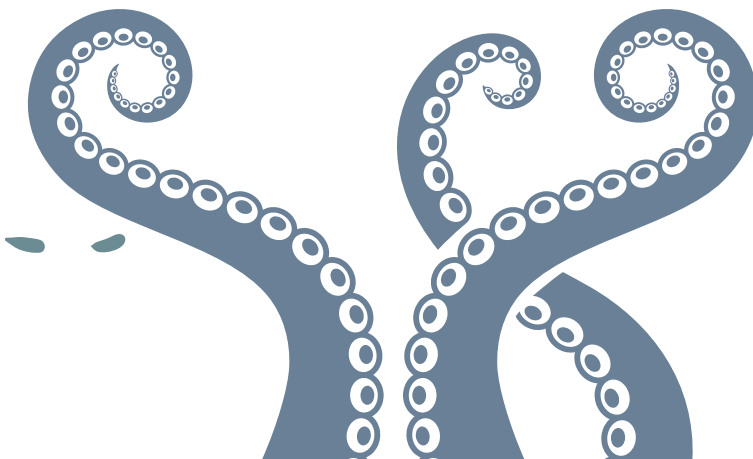
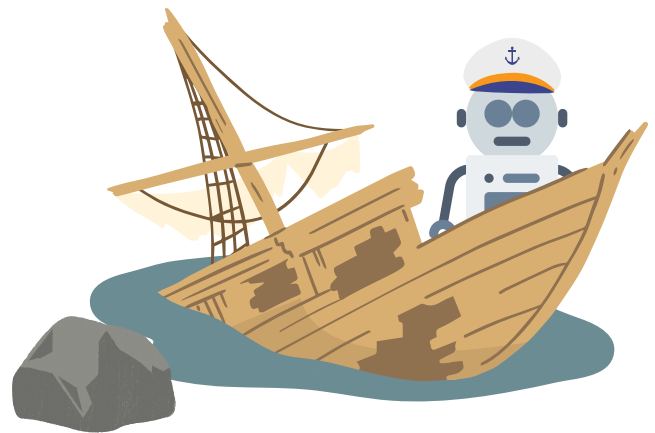
Classification des sons environnementaux



Classification du langage naturel



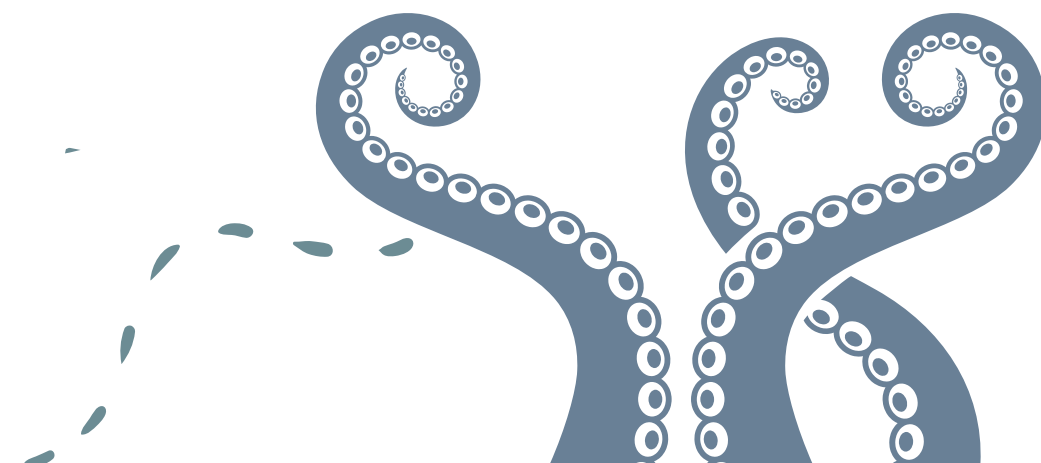
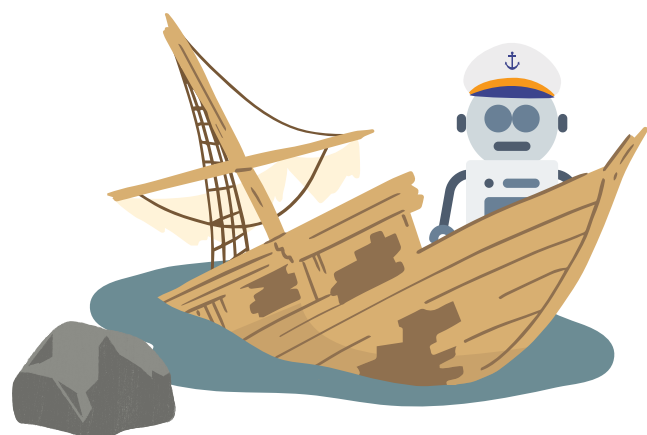
Classification de la musique



COMMENT CRÉER UNE APPLICATION INTELLIGENTE ?



Obtenir de la donnée



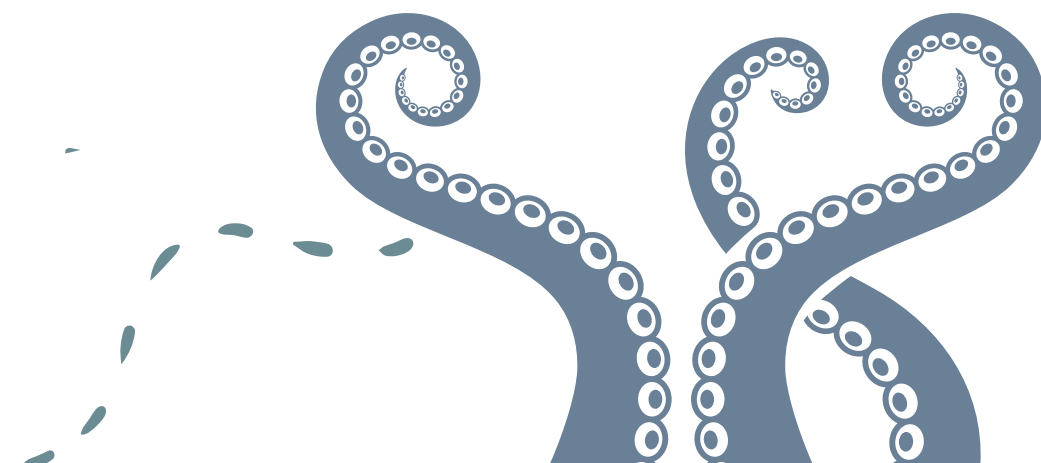
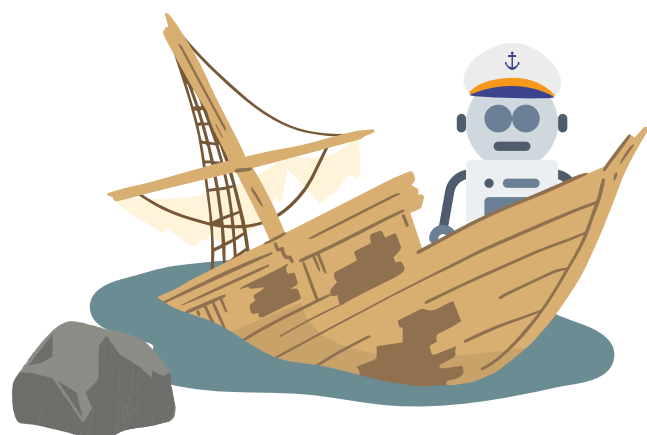
COMMENT CRÉER UNE APPLICATION INTELLIGENTE ?



Obtenir de la donnée



Traiter la donnée



COMMENT CRÉER UNE APPLICATION INTELLIGENTE ?



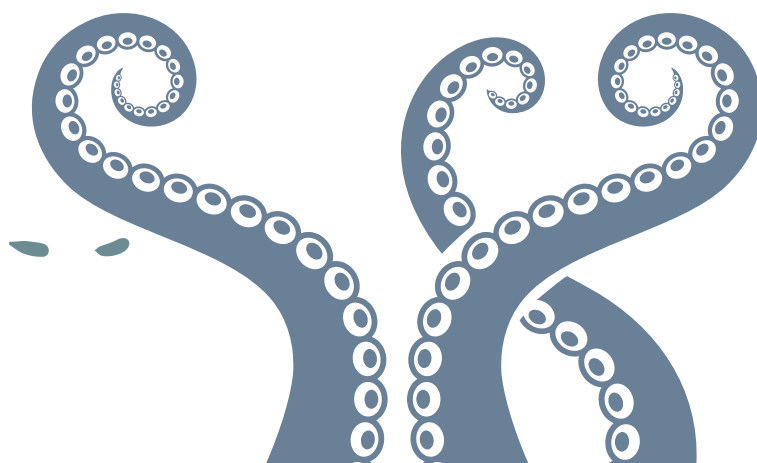
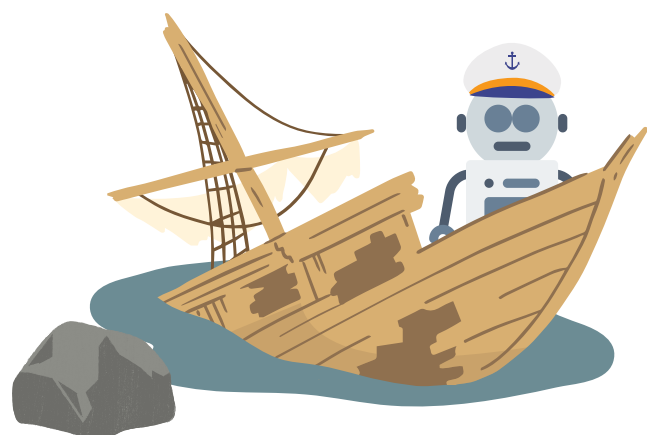
Obtenir de la donnée



Traiter la donnée



Créer ou optimiser un modèle existant



COMMENT CRÉER UNE APPLICATION INTELLIGENTE ?



Obtenir de la donnée



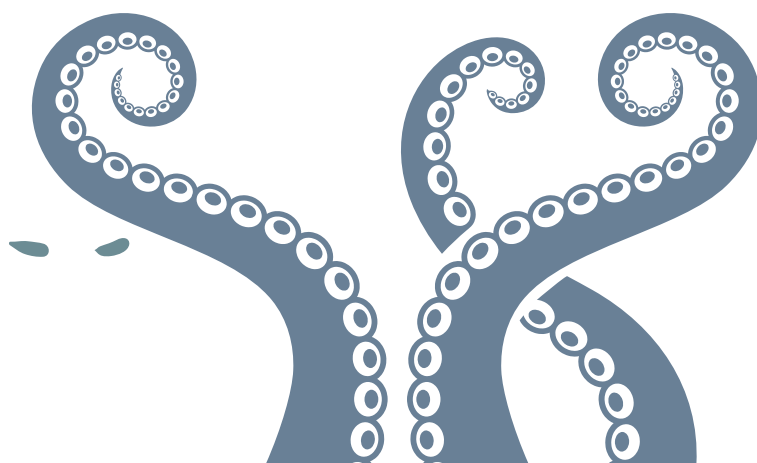
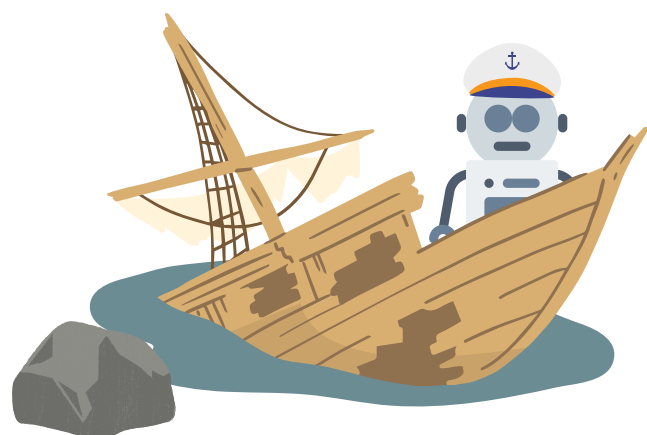
Traiter la donnée



Créer ou optimiser un modèle existant



Entraîner son modèle



COMMENT CRÉER UNE APPLICATION INTELLIGENTE ?



Obtenir de la donnée



Traiter la donnée



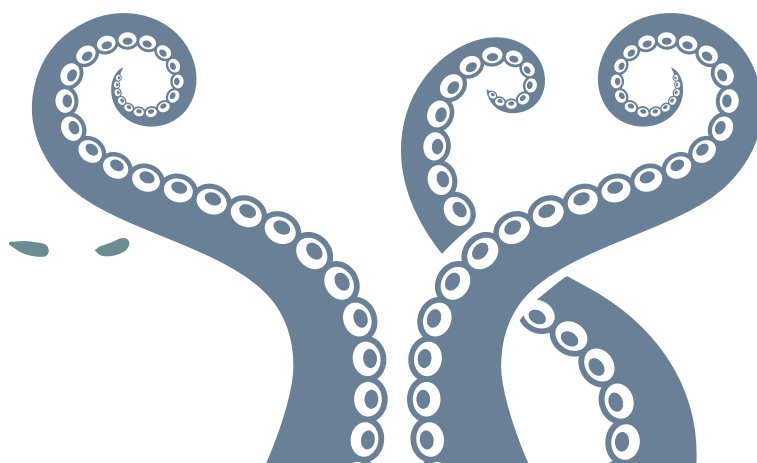
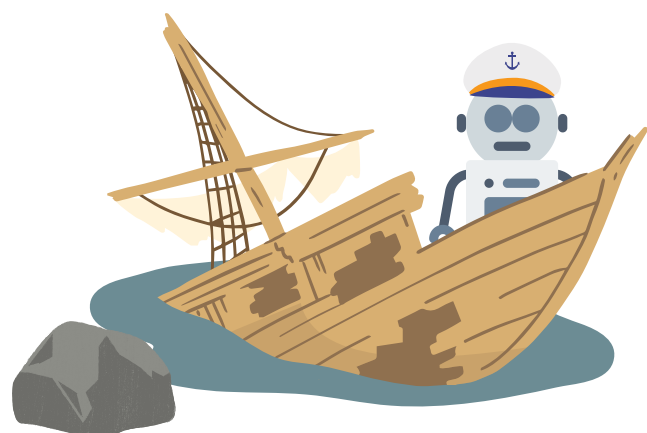
Créer ou optimiser un modèle existant



Entraîner son modèle



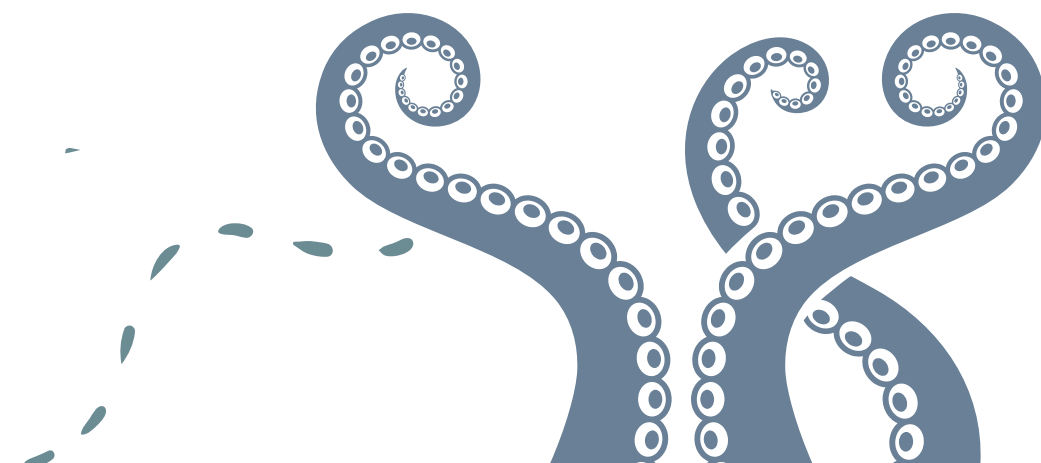
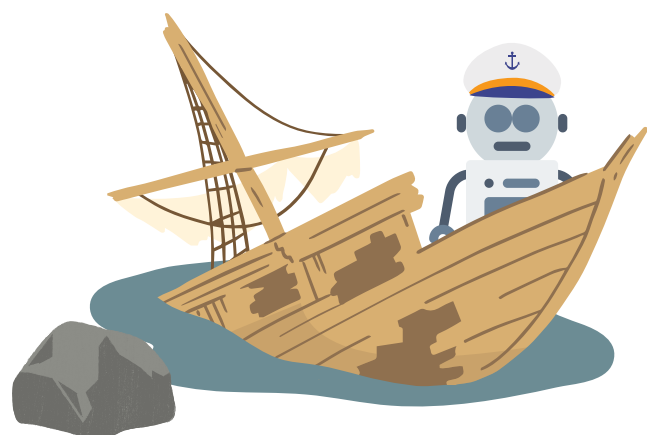
Utiliser son modèle

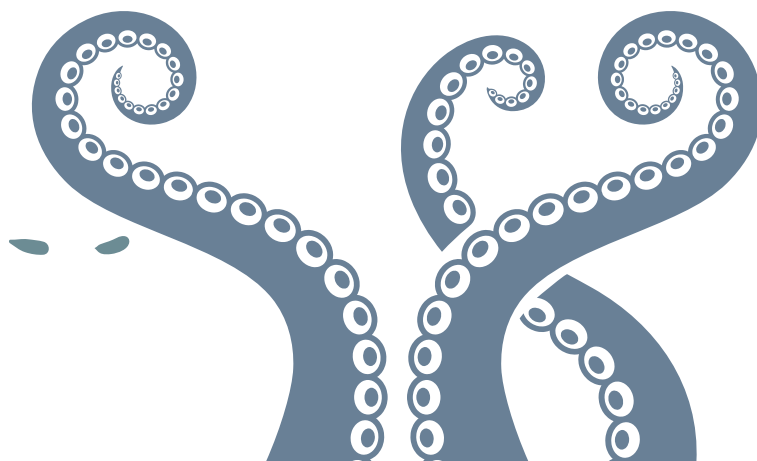
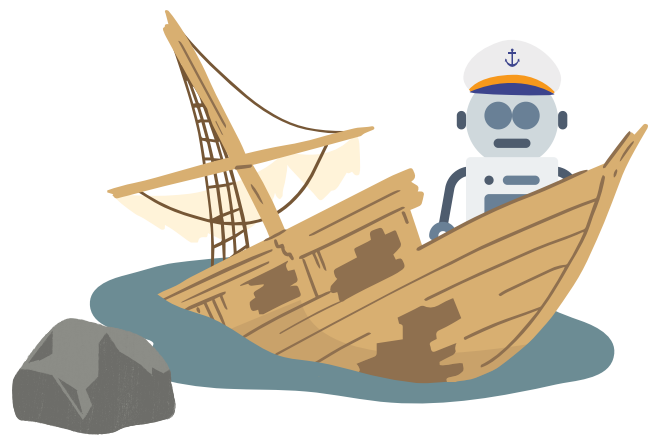
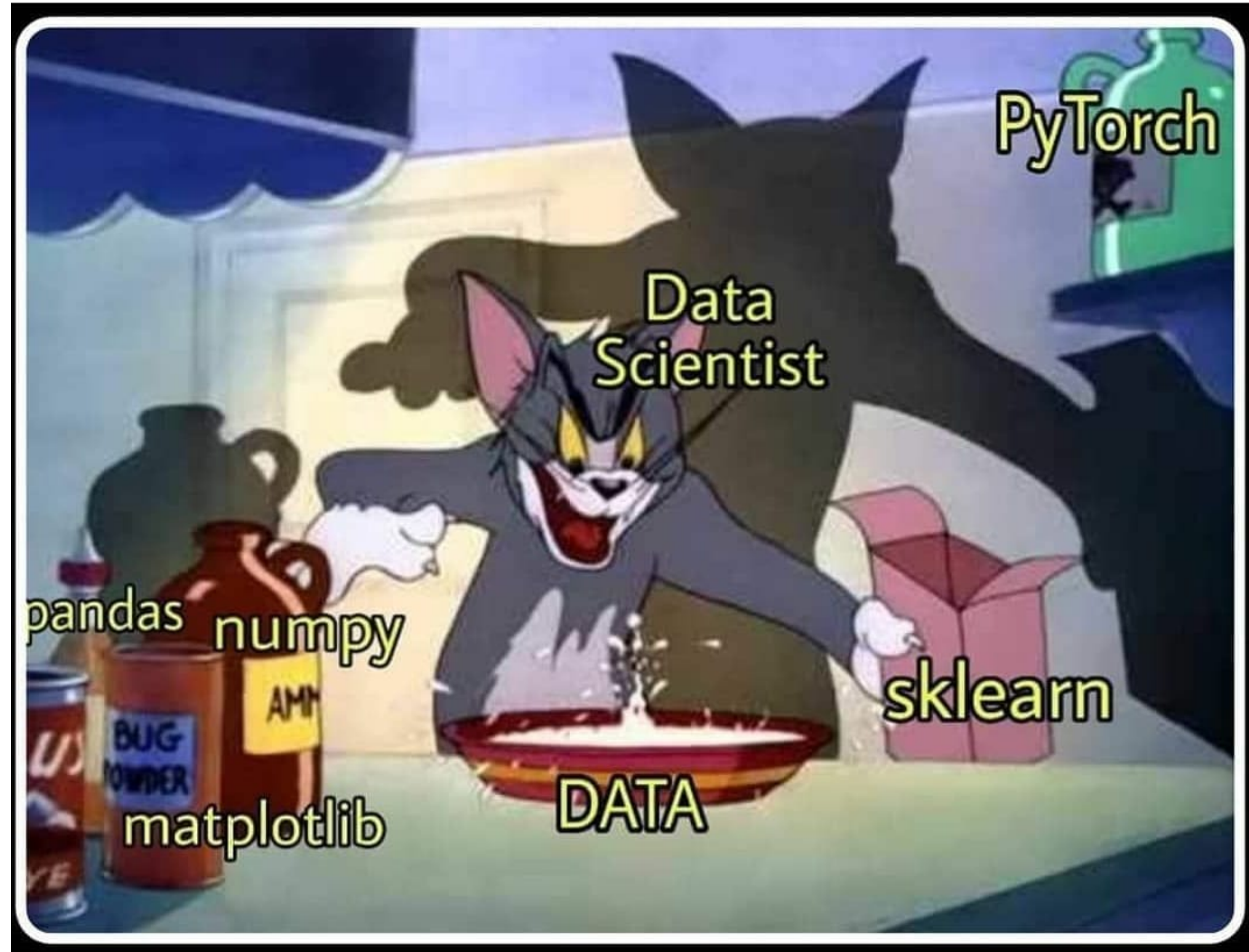


IMPORTANCE DU PRÉ-TRAITEMENT DES DONNÉES

✨ QUALITÉ DES DONNÉES

💡 INFORMATIONS UTILES





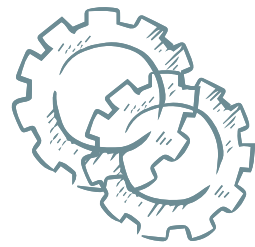
EXEMPLES DE PRÉ-TRAITEMENT POUR LES DONNÉES



Gestion des valeurs nulles / manquantes



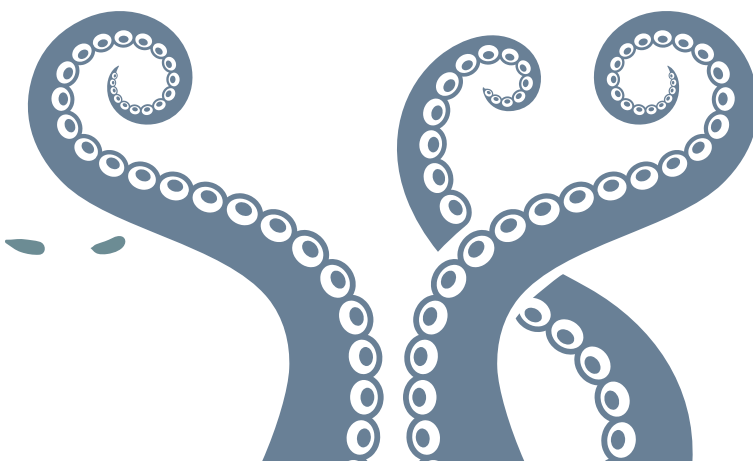
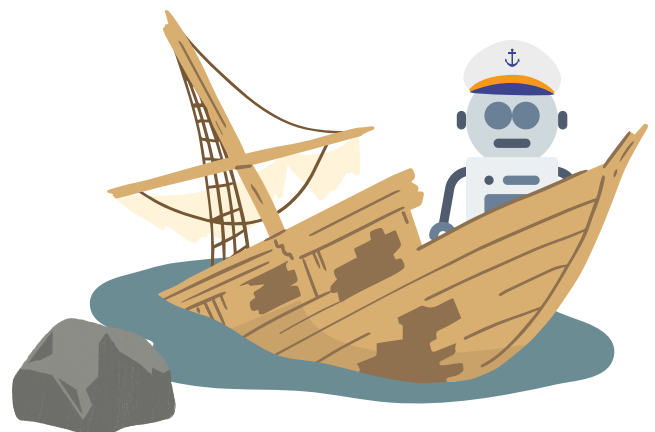
Normalisation



Gestion des variables qualitatives



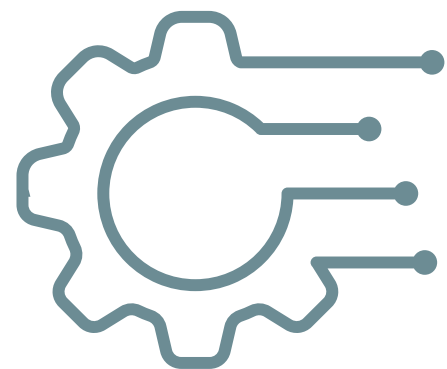
Encodage à chaud



ET POUR LES DONNÉES AUDIOS ?



audios .wav



paramètres audio
Librosa

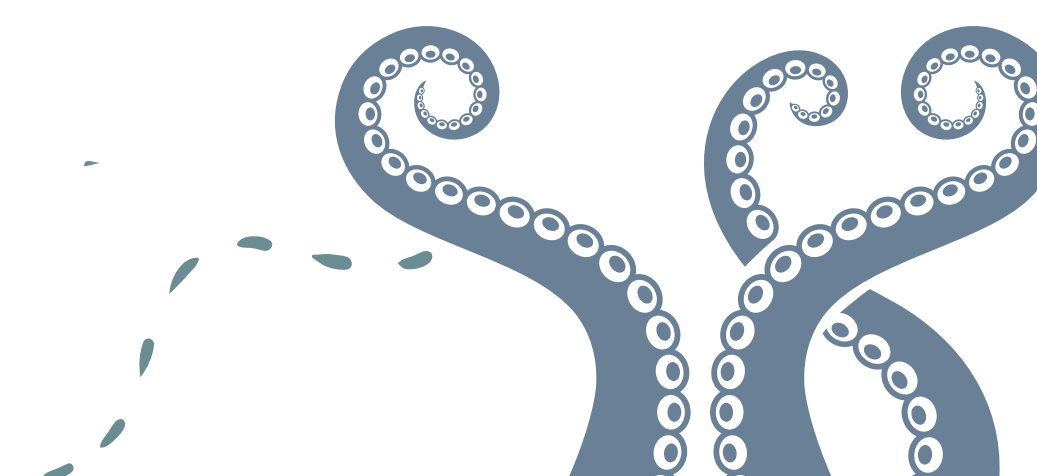
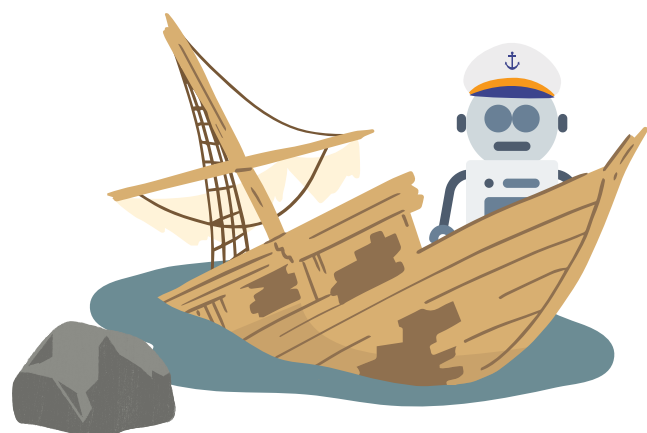


N paramètres audio Librosa



name	length	name

fichier .csv

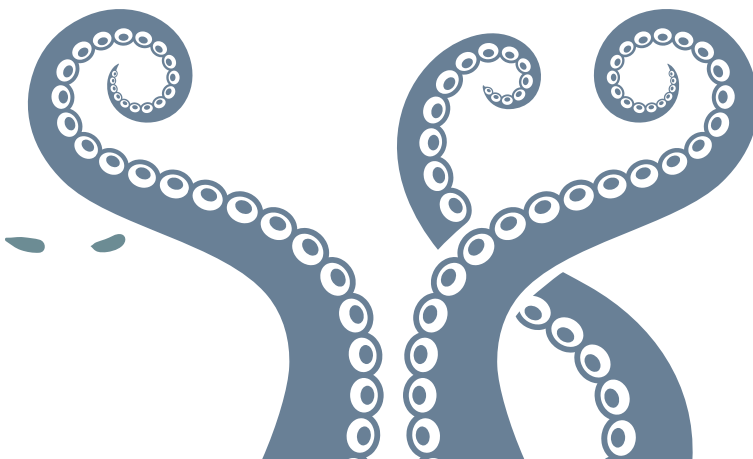
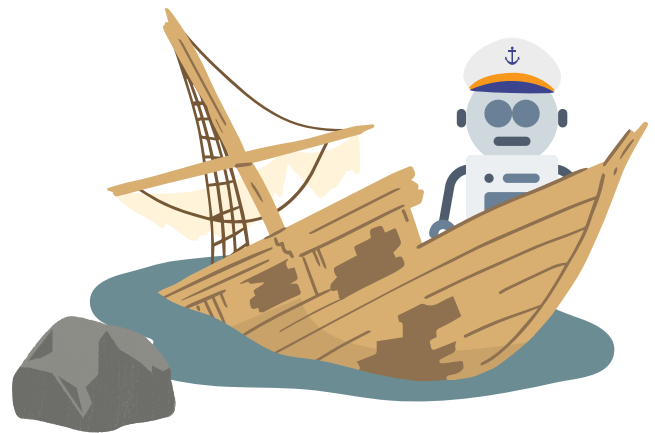




**me cleaning
the data**



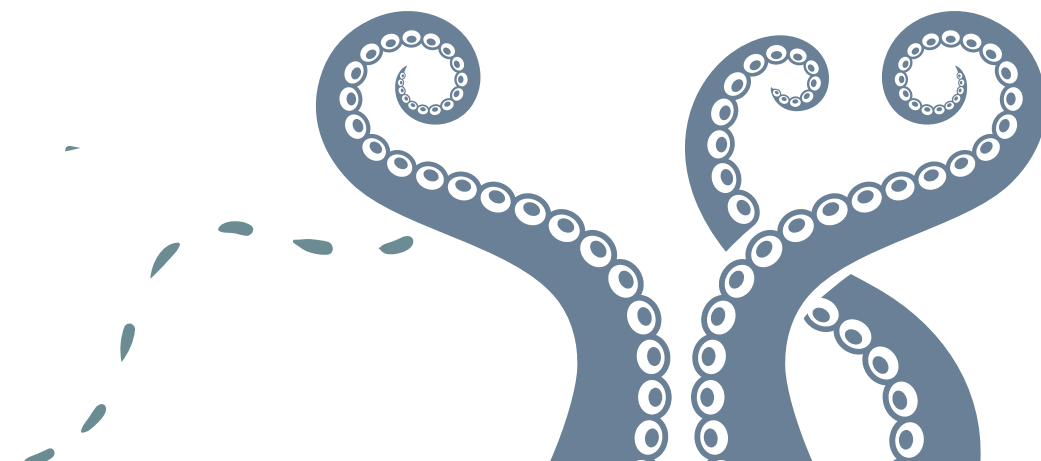
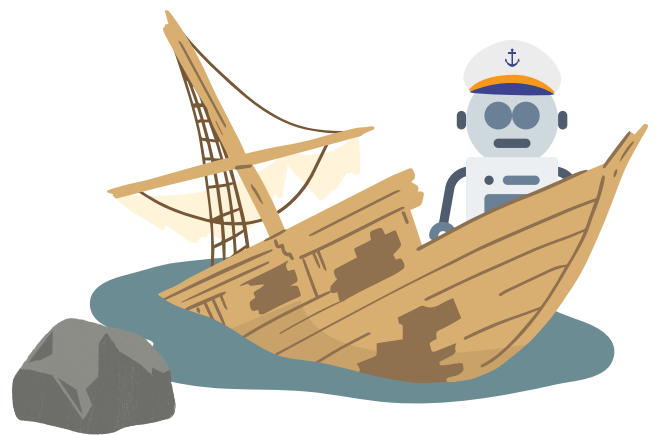
**me building
the model**



TECHNOS ET OUTILS



Le langage le plus utilisé : Python



TECHNOS ET OUTILS

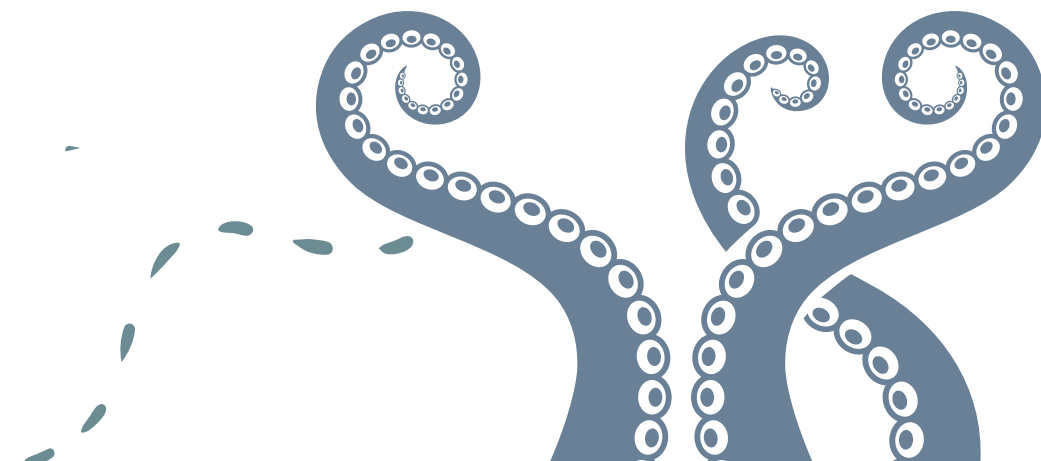
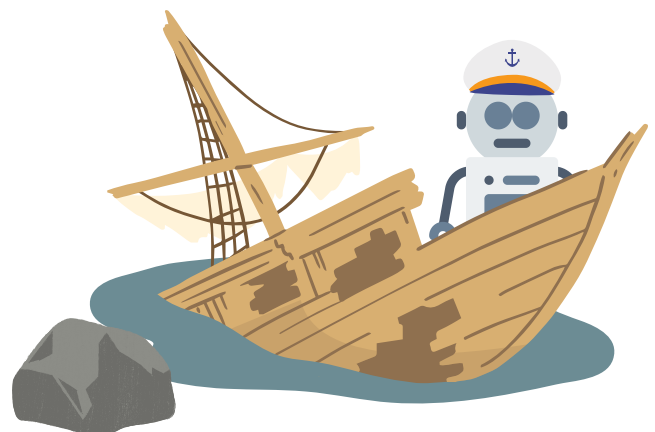


Le langage le plus utilisé : Python



Beaucoup d'IDE (PyCharm, VSCode ...)

Le cas à part de JupyterLab



TECHNOS ET OUTILS



Le langage le plus utilisé : Python



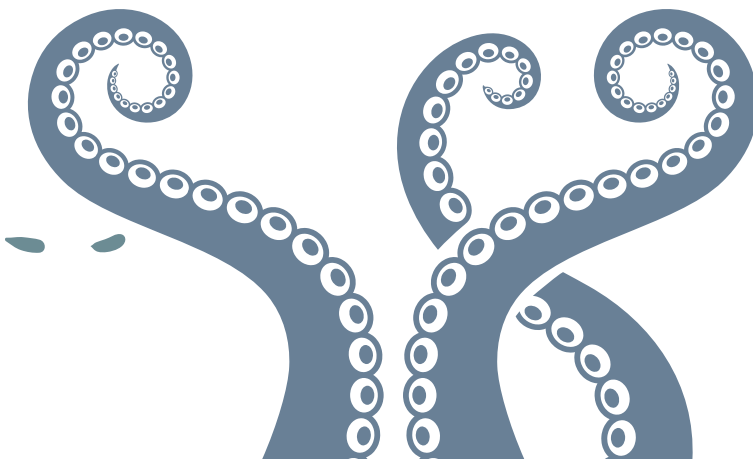
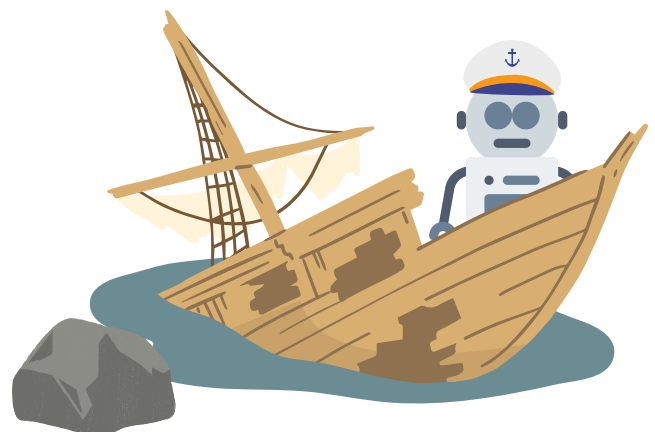
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Le cas à part de JupyterLab



Les frameworks sont nombreux

Peut dépendre du type de modèle ou donnée manipulée



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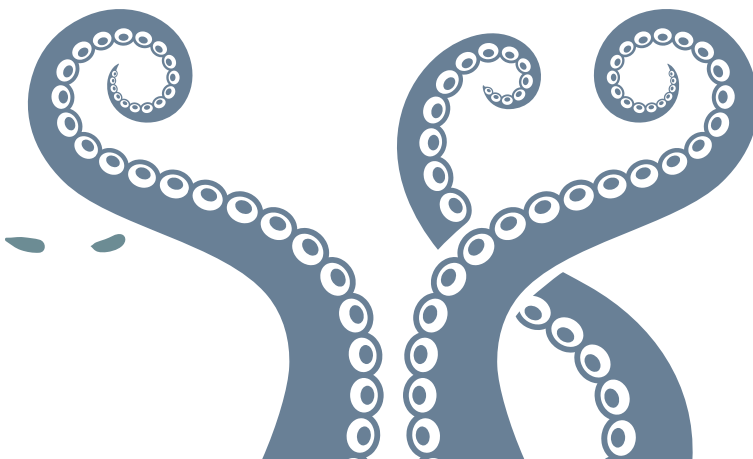
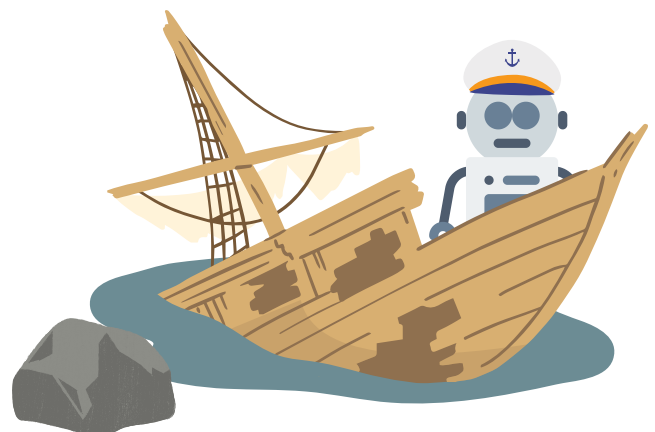
Le cas à part de JupyterLab



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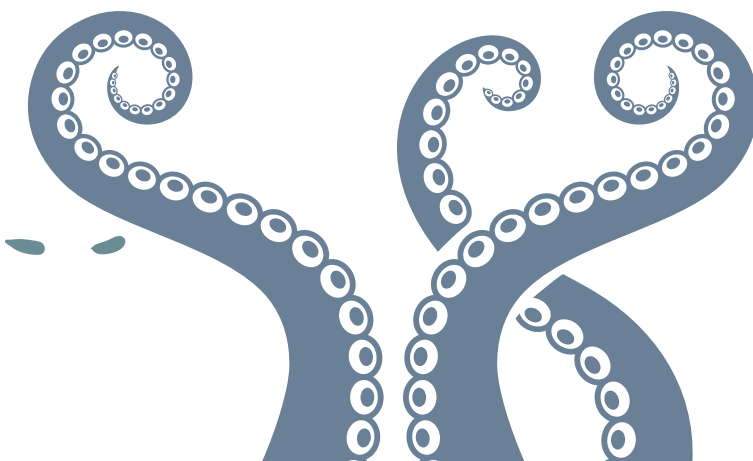
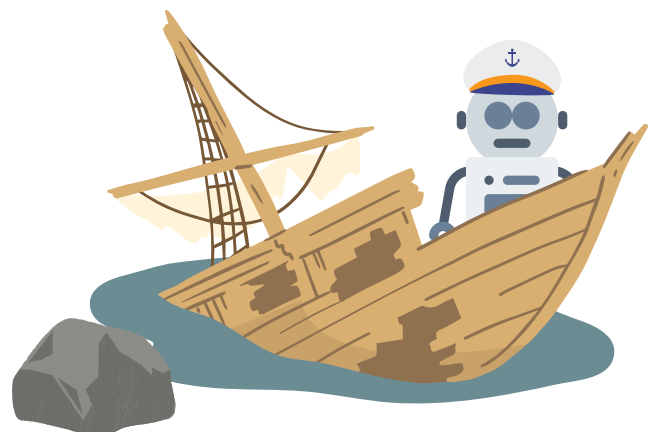


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Construction de modèles, Apprentissage, Front, Back, ...



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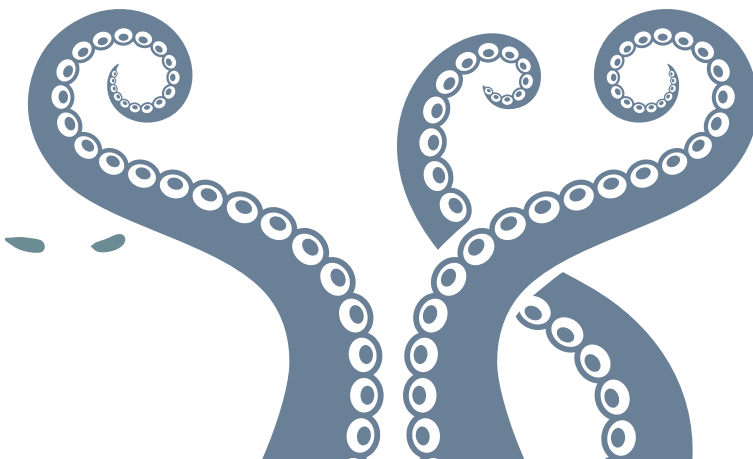
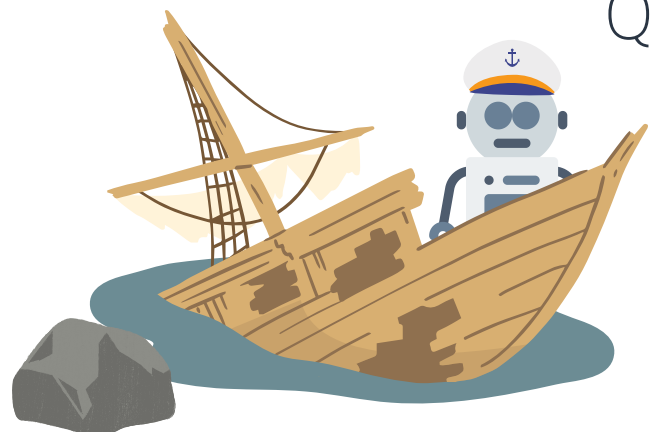
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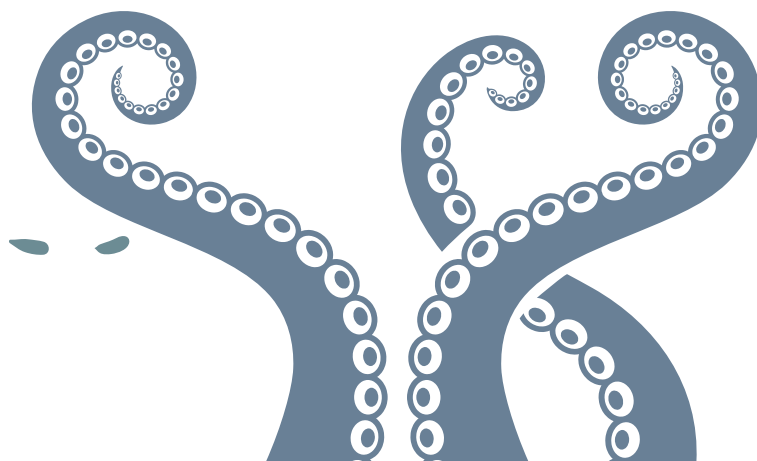
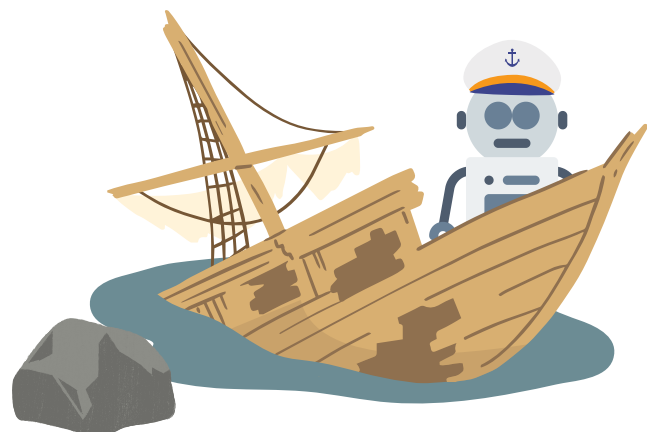
Quelques frameworks connus : Pytorch, TensorFlow, Streamlit, ...



DÉMO TIME !

```
0 response = requests.get(url)
1
2 # checking response.status_code (if you get 502, try rerunning the code)
3 if response.status_code != 200:
4     print(f"Status: {response.status_code} - Try rerunning the code!")
5 else:
6     print(f"Status: {response.status_code}\n")
7
8 # using BeautifulSoup to parse the response object
9 soup = BeautifulSoup(response.content, "html.parser")
10
11 # finding Post images in the soup
12 images = soup.find_all("img", attrs={"alt": "Post Image"})
13
14 # downloading images
15 counter = 0
16 for image in images:
17     url = image.get("src")
18     response = requests.get(url)
19     with open(f"image_{counter}.jpg", "wb") as f:
20         f.write(response.content)
21     counter += 1
```

Artturi Jalli



IDENTIFIER UN MAMMIFÈRE PAR RAPPORT À SON CRI



Notebook

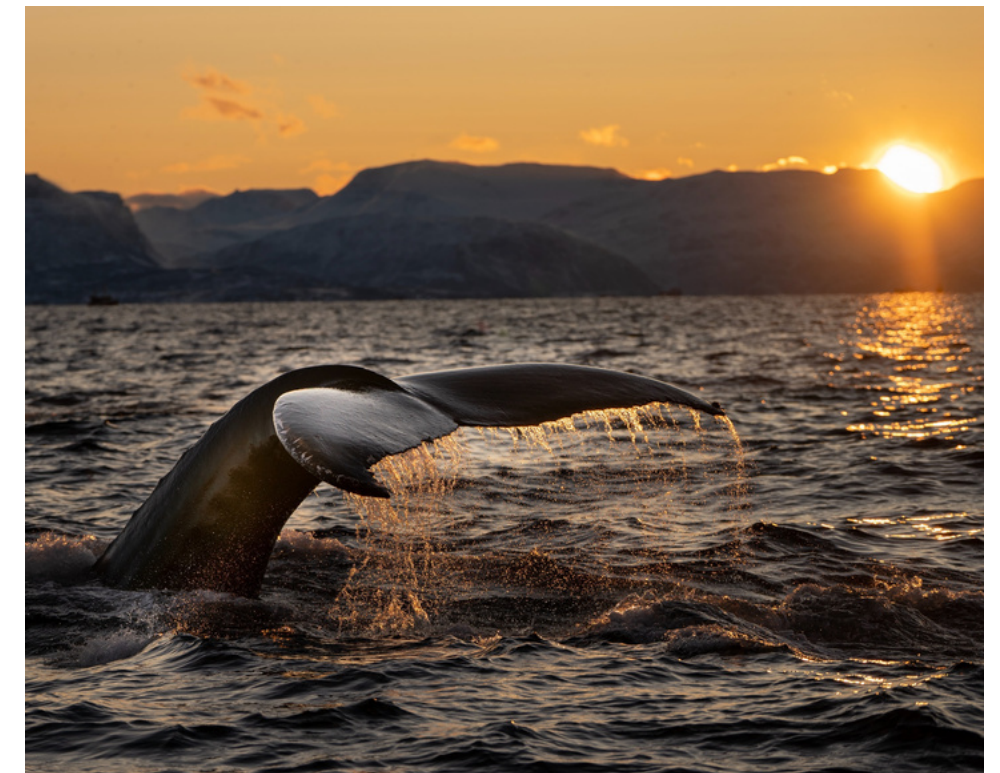
Analyse de l'audio

Pré-traitement des données

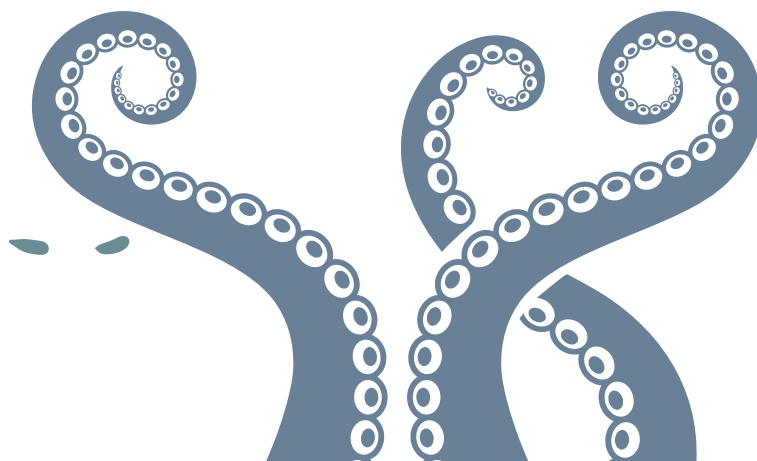
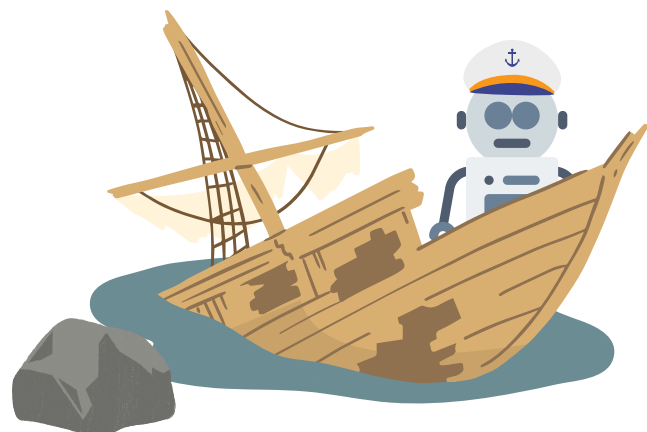
Construction du modèle

Entraînement et évaluation du modèle

Test et enregistrement modèle



Bart van meeke



IDENTIFIER UN MAMMIFÈRE PAR RAPPORT À SON CRI



Notebook

Analyse de l'audio
Pré-traitement des données
Construction du modèle
Entraînement et évaluation du modèle
Test et enregistrement modèle

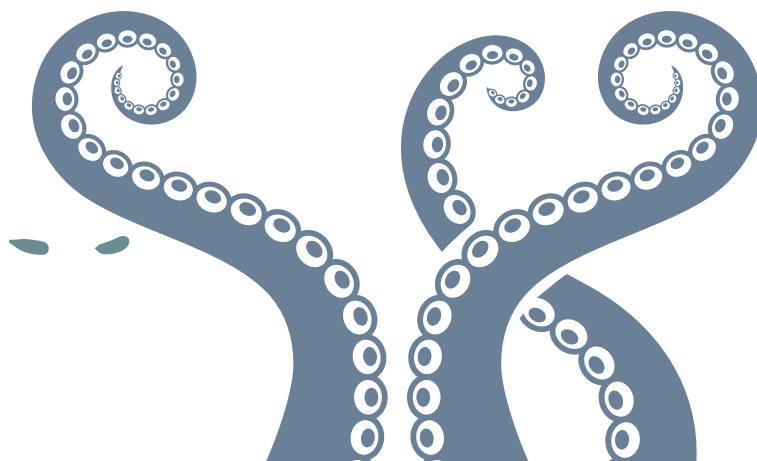
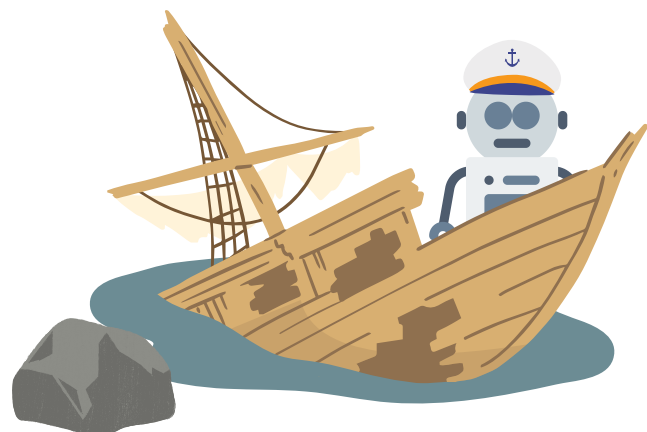


Applications

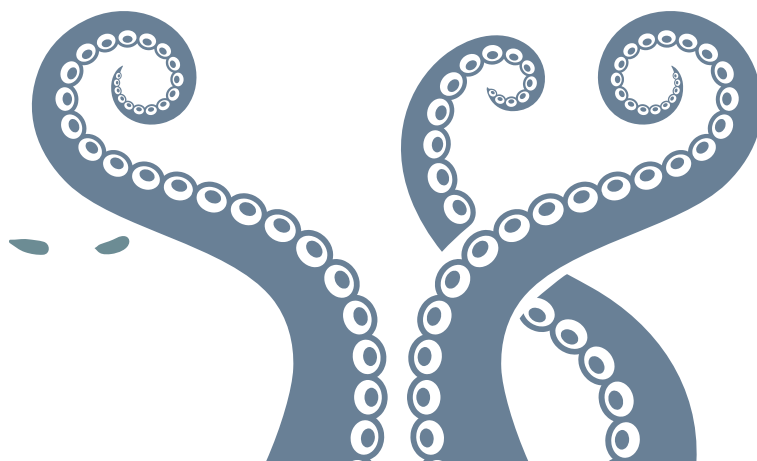
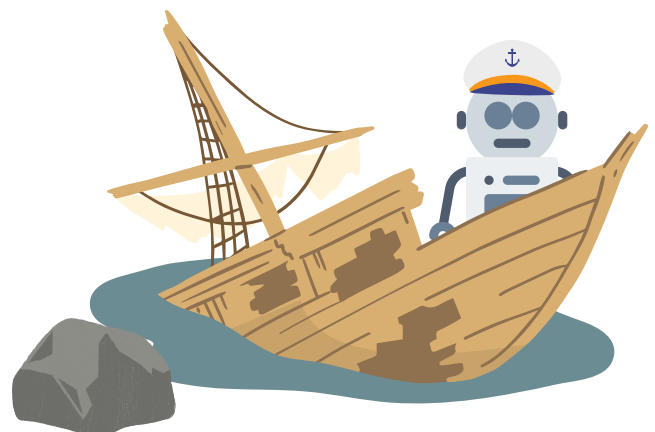
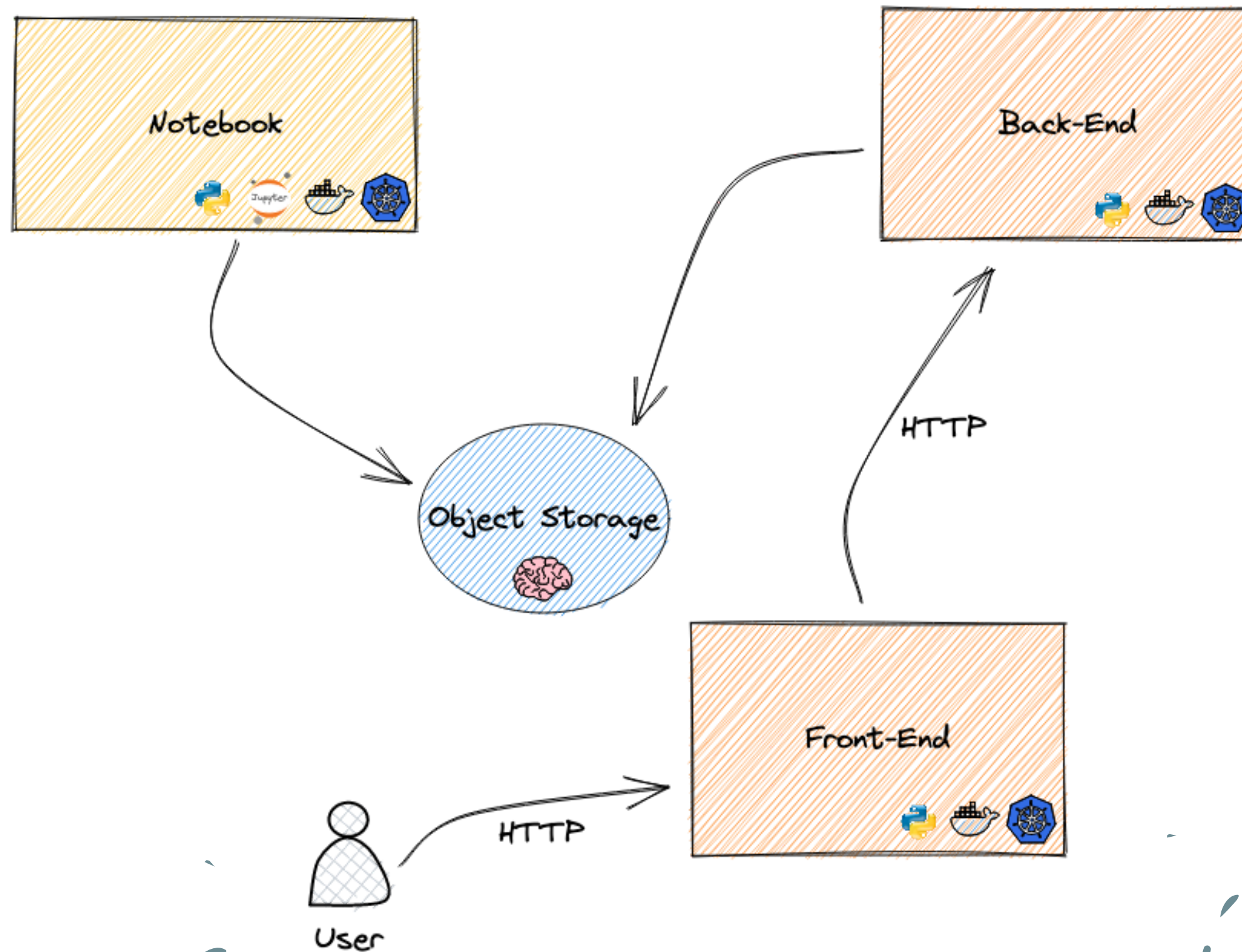
Back-End : exposition de l'API
Front-End : analyse d'un son chargé ou enregistré

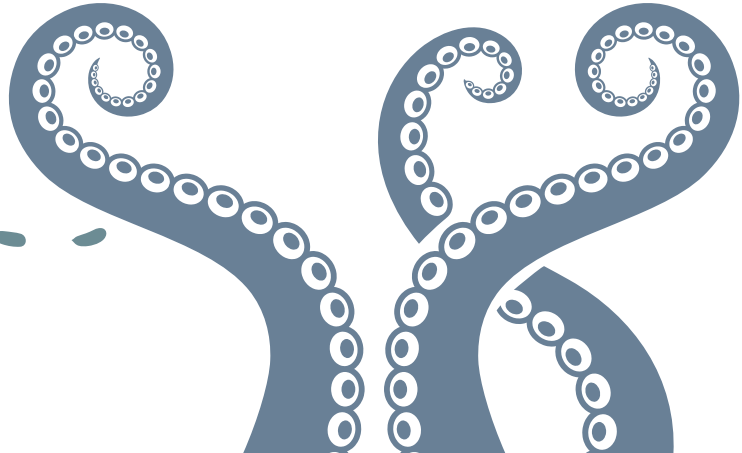
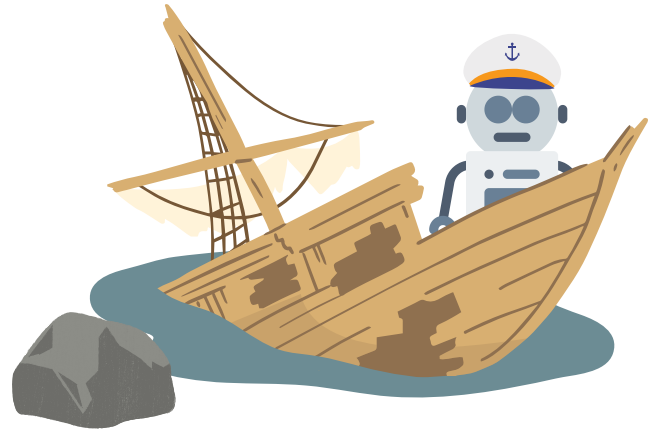
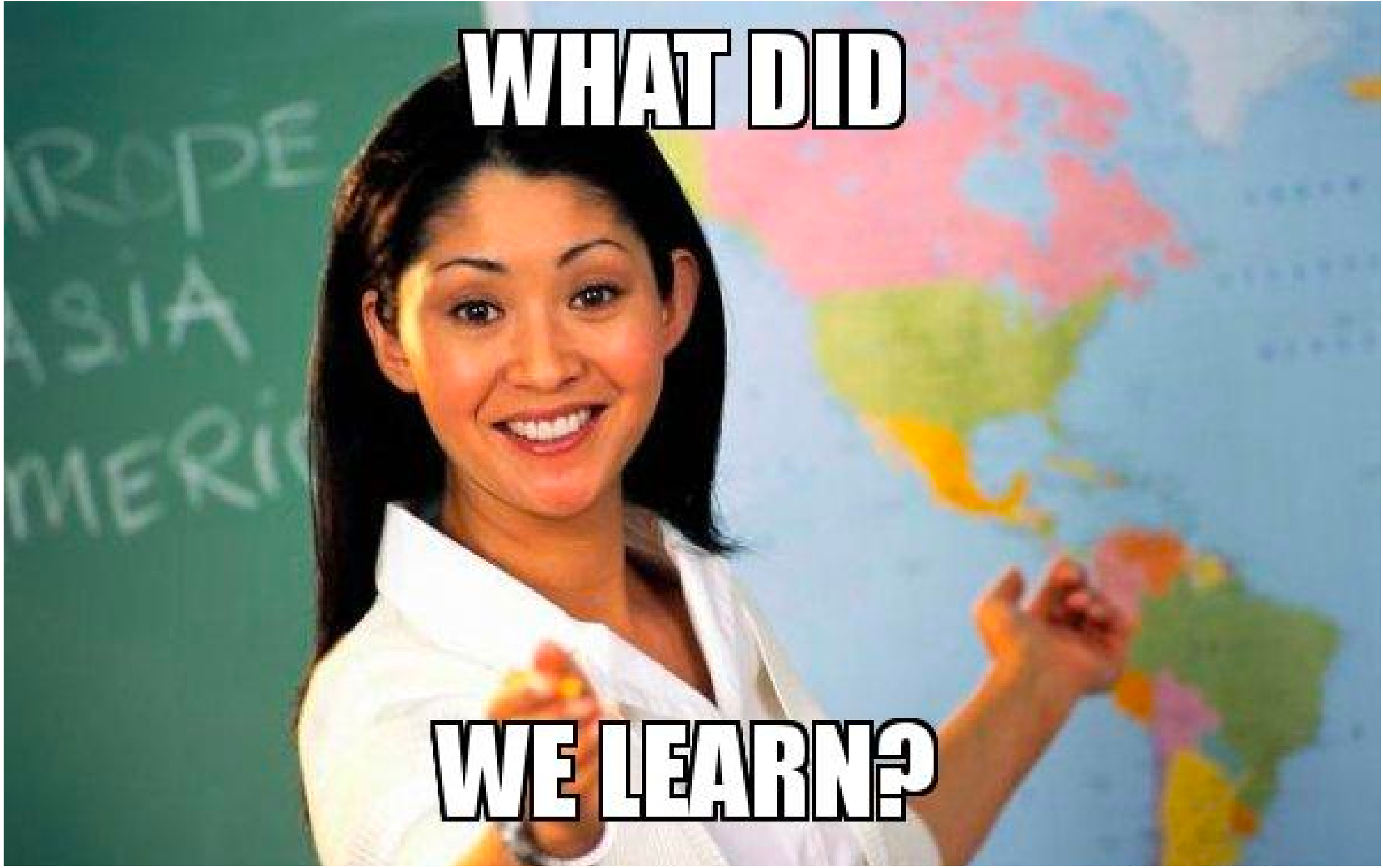


Bart van meeke



SCHEMA D'ARCHITECTURE GLOBALE

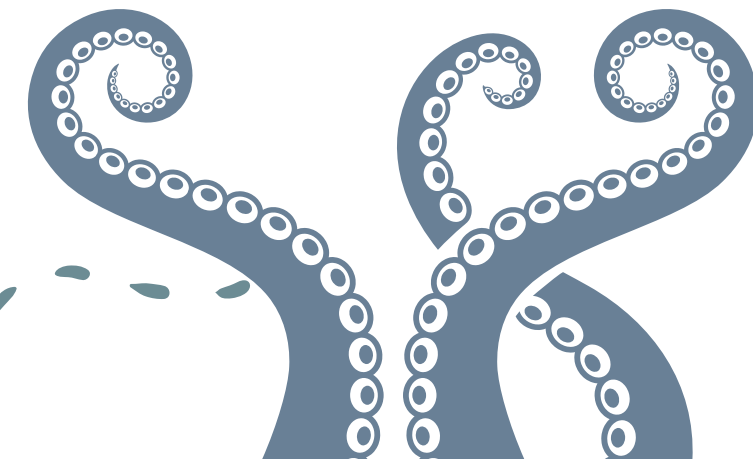




QU'AVONS NOUS APPRIS AUJOURD'HUI ?

NOTION D'IA

Datascience, Machine Learning, Deep Learning



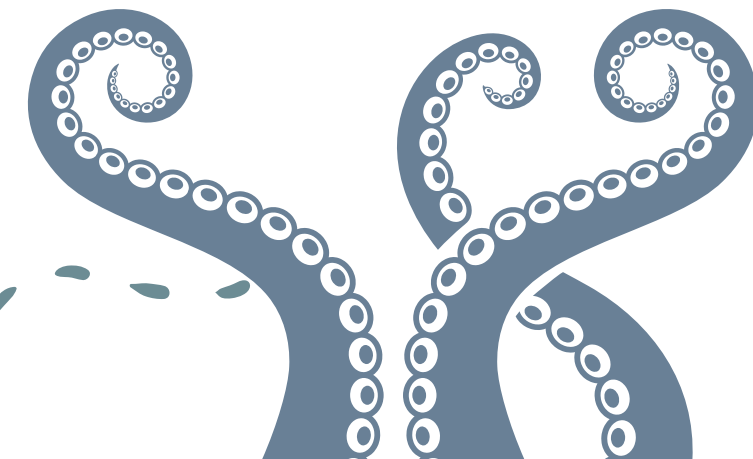
QU'AVONS NOUS APPRIS AUJOURD'HUI ?

NOTION D'IA

Datascience, Machine Learning, Deep Learning

PLACE DU SON EN IA

Environnement, musique, NLP



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Datascience, Machine Learning, Deep Learning

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Environnement, musique, NLP

PRÉTRAITEMENT DES DONNÉES

Répartition, transformation, labélisation

QU'AVONS NOUS APPRIS AUJOURD'HUI ?

NOTION D'IA

Datascience, Machine Learning, Deep Learning

AI NOTEBOOK

Développement de mon code étape par étape

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Réseau de neurones, exportation

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Répartition, transformation, labélisation

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AI NOTEBOOK

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ENTRAÎNEMENT D'UNE IA

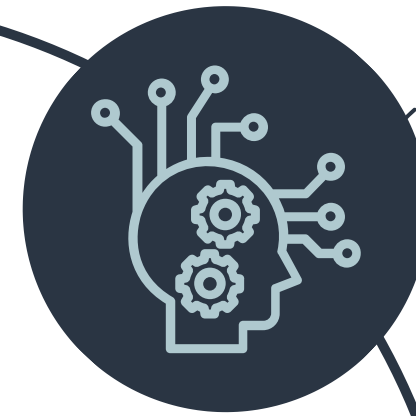
Réseau de neurones, exportation

APP POUR IA

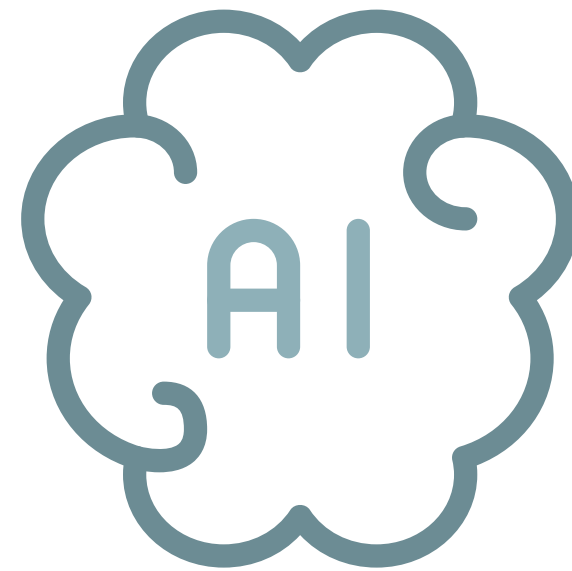
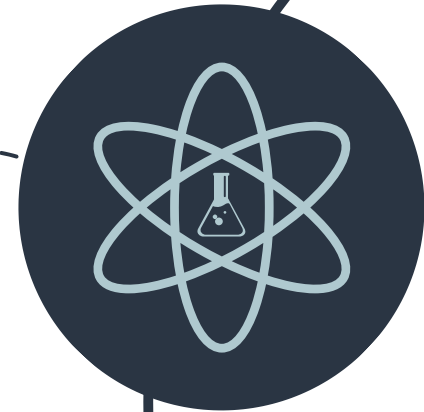
Object Storage, Streamlit, Docker, API

LES MÉTIERS DE L'IA

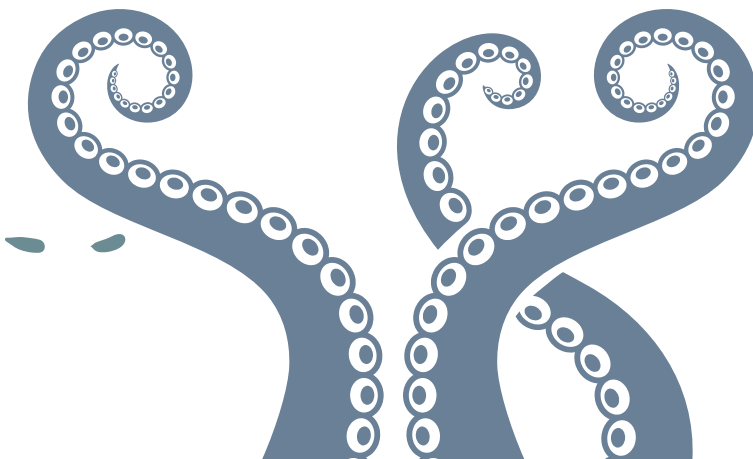
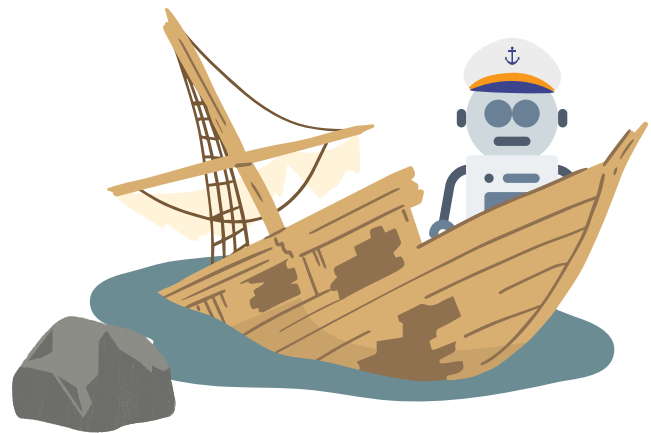
MACHINE LEARNING ENGINEER



DATA SCIENTIST

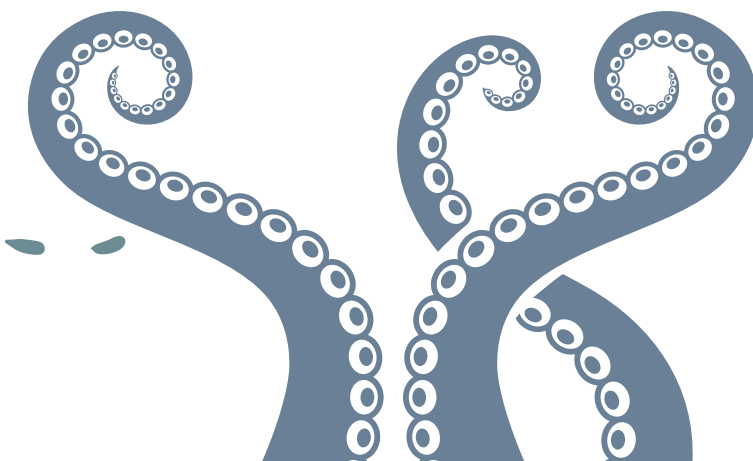
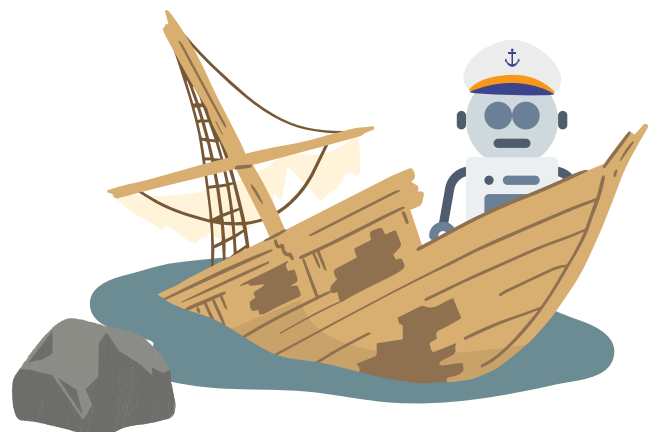
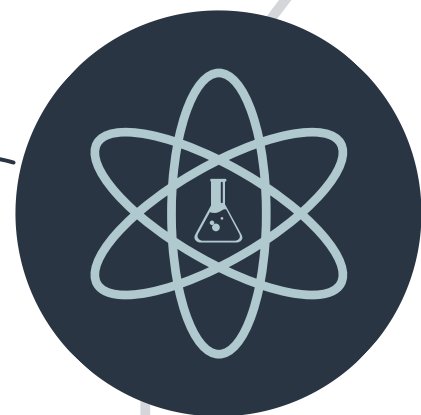


DEVELOPER



LES MÉTIERS DE L'IA

DATA SCIENTIST



LE DATA SCIENTIST



Data Analysis



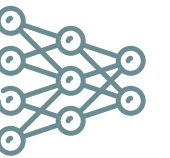
Data Visuatization



Programmation



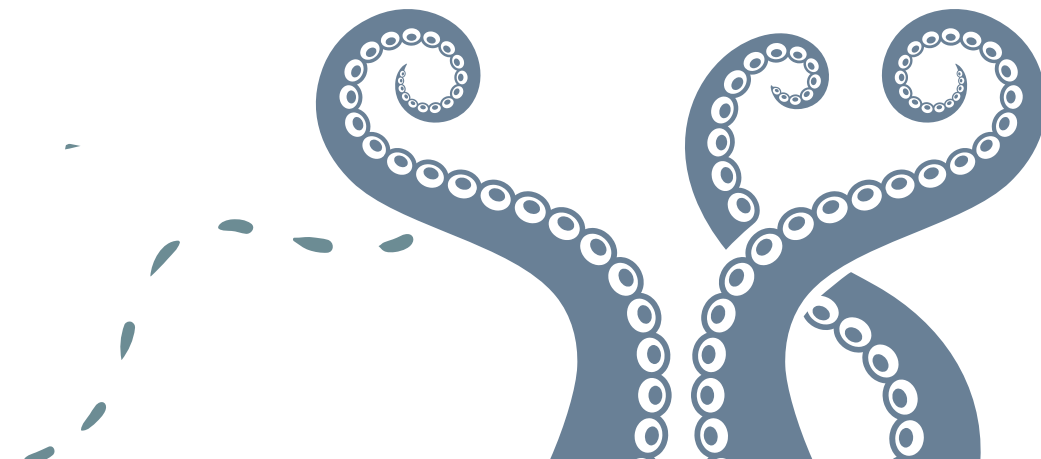
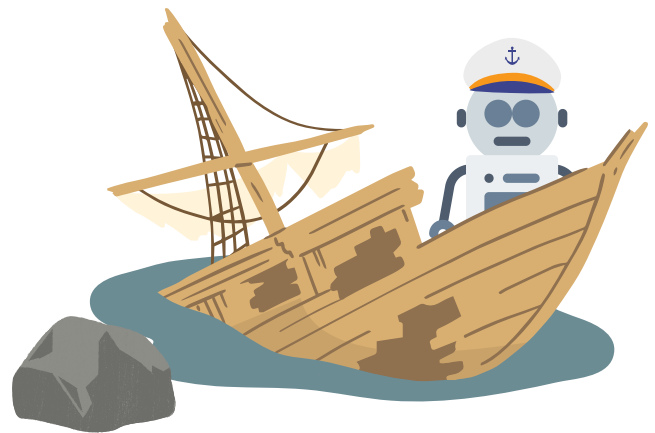
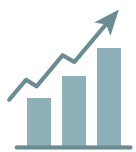
Machine Learning



Maths f_x

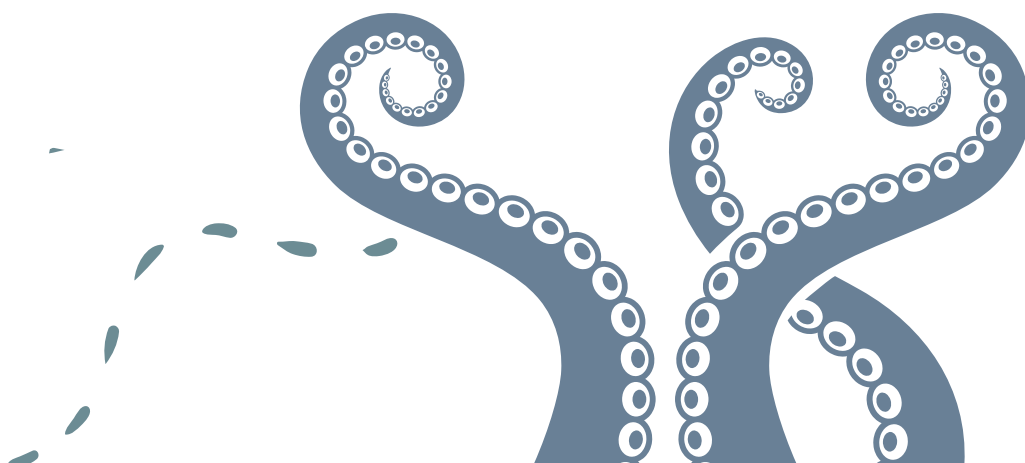
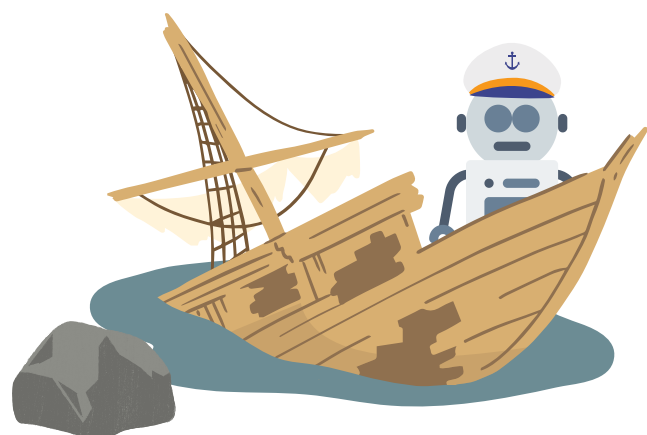
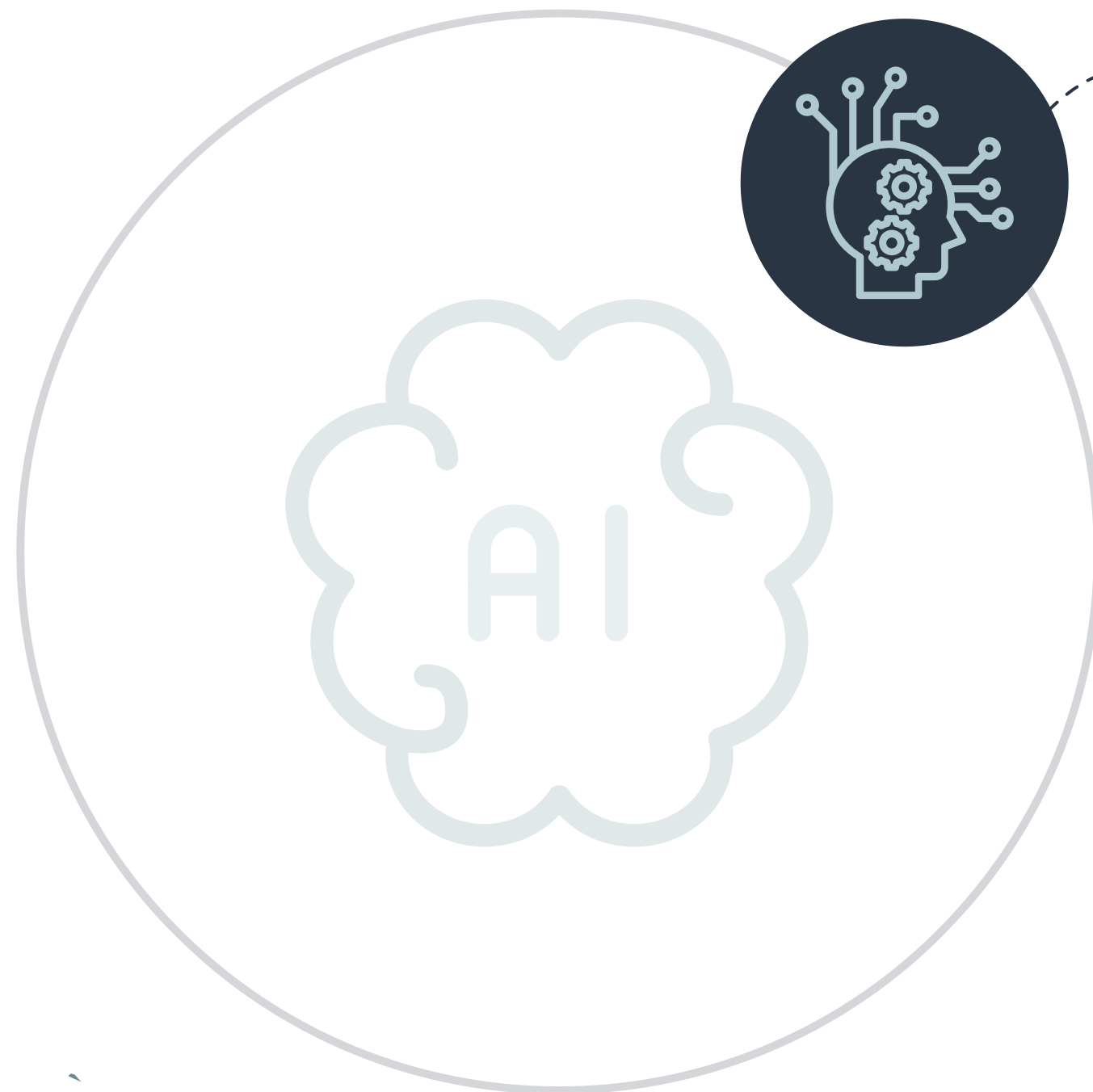
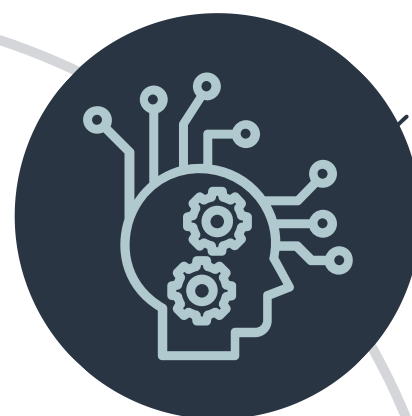


Statistics



LES MÉTIERS DE L'IA

MACHINE LEARNING ENGINEER



LE MACHINE LEARNING ENGINEER



Data Science



f_x

Maths & Statistics



Programmation



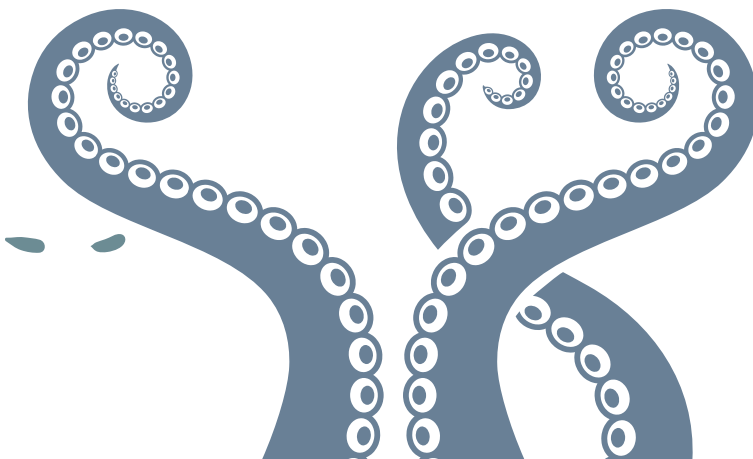
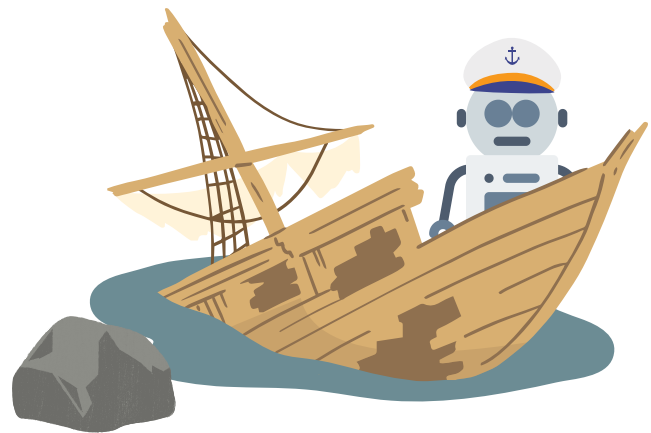
Frameworks



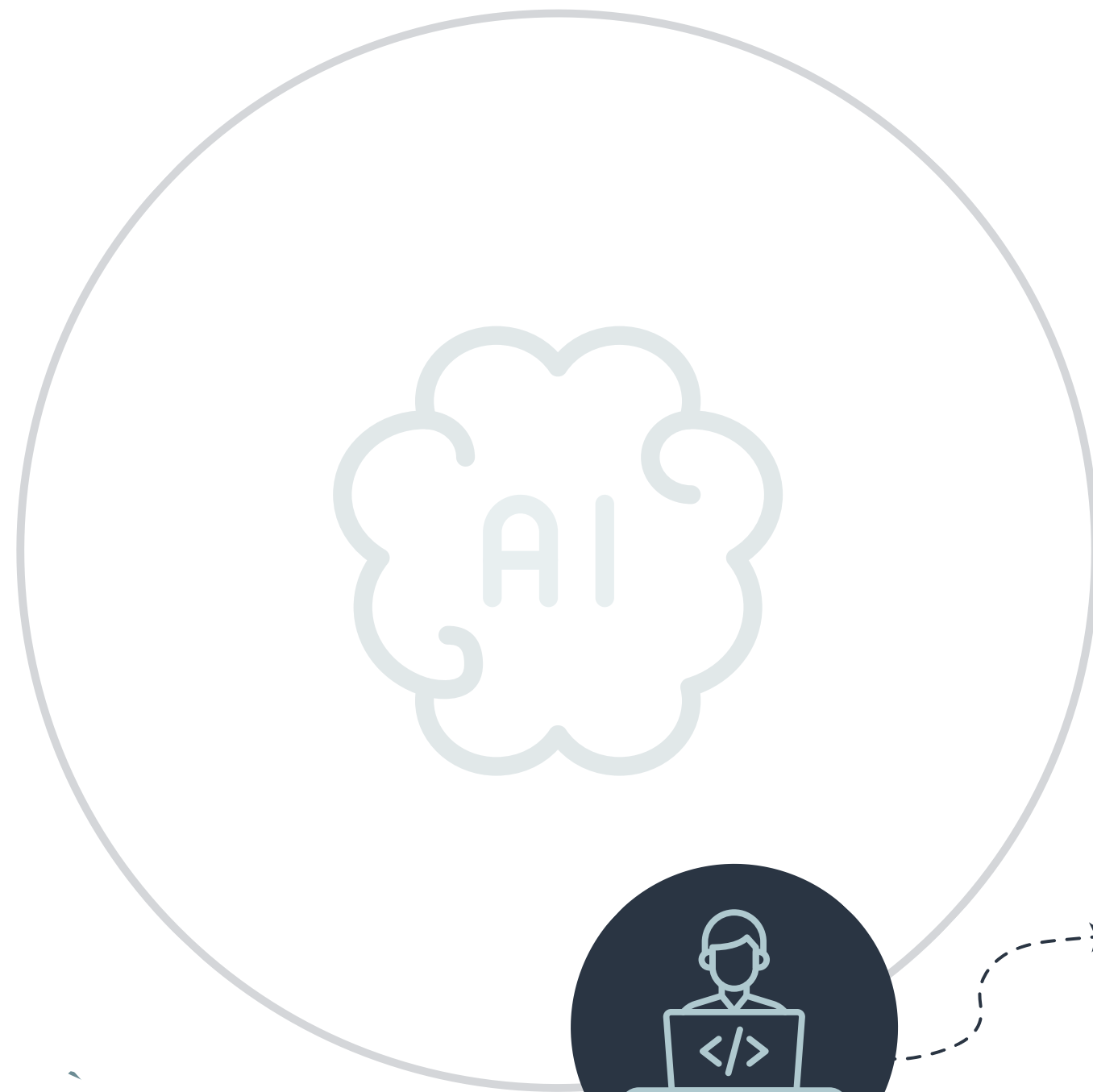
Environnement de prod



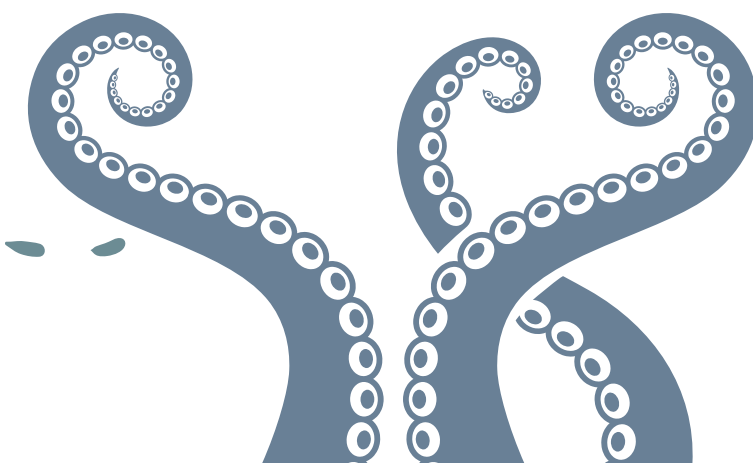
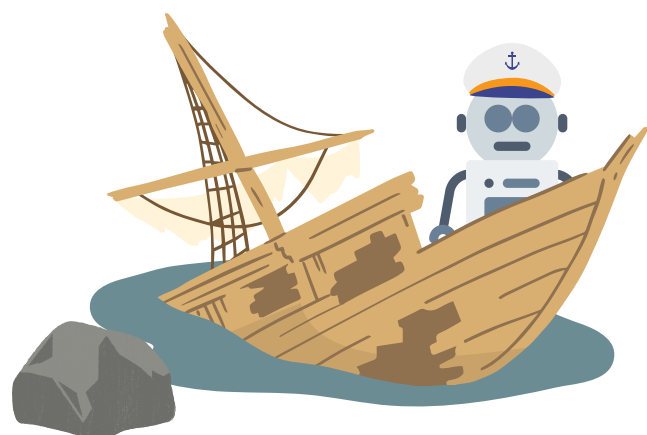
Services Cloud



LES MÉTIERS DE L'IA



DEVELOPER



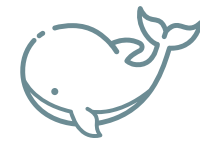
LE DÉVELOPPEUR



Python



Docker



Concepts IA



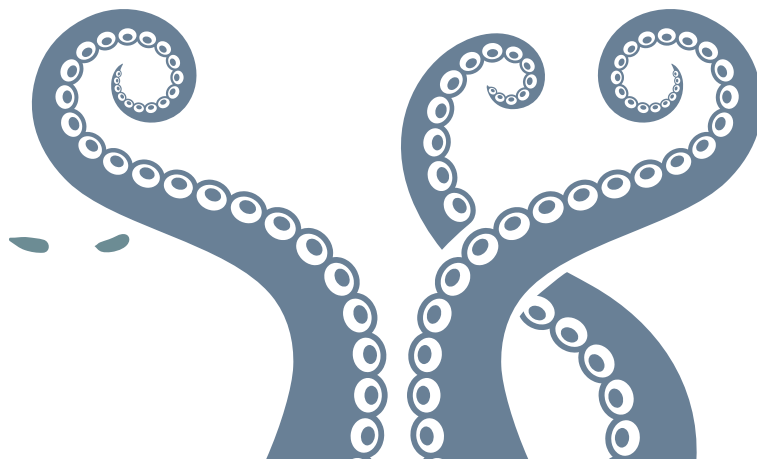
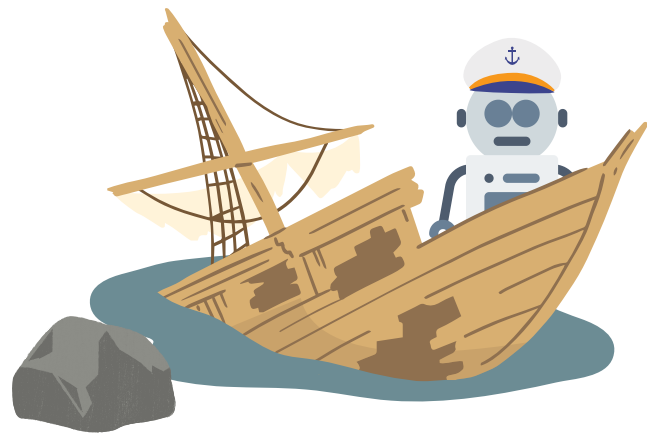
Frameworks



Développement

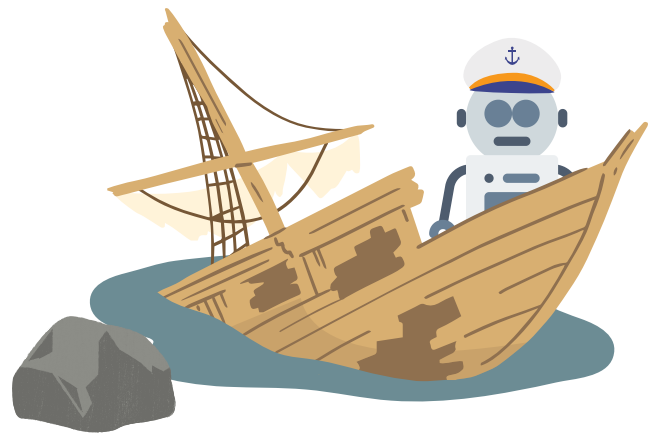


Outillage



ELEA PETTON

 MACHINE LEARNING ENGINEER @OVHCLOUD



@EleaPetton



eleaptn



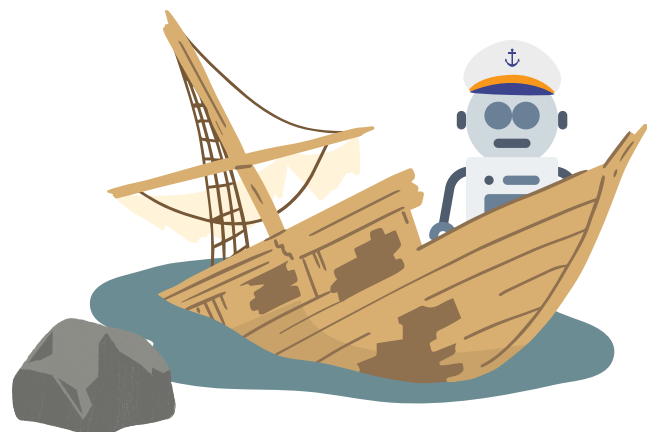
Eléa PETTON

STÉPHANE PHILIPPART

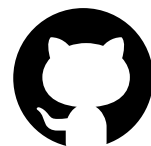
DEVREL@OVHCLOUD

CO-CRÉATEUR DE TADX

[HTTPS://PHILIPPART-S.GITHUB.IO/BLOG](https://philippart-s.github.io/blog)



@wildagsx

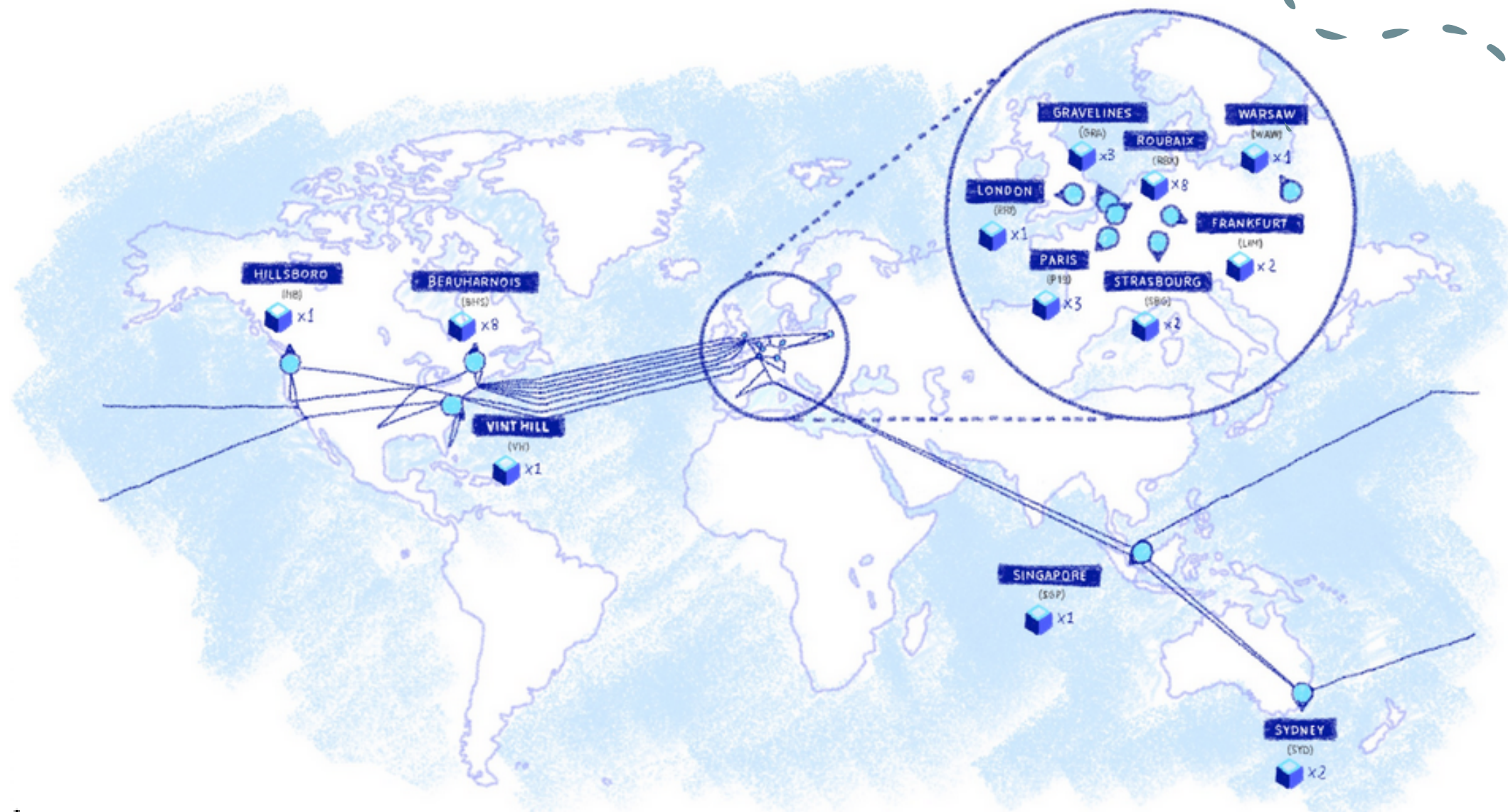
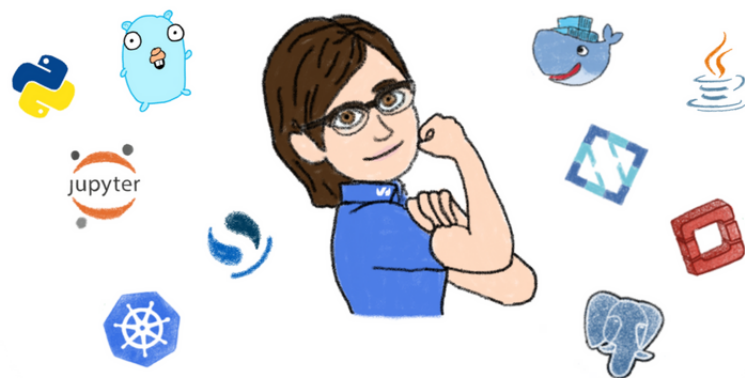


philippart-s



philippartstephane

The Cloud with European values

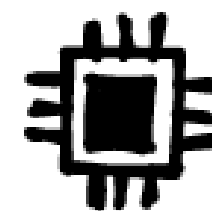


- Bare Metal Cloud
- Hosted Private Cloud
- Public Cloud
- Web Cloud
- Télécom

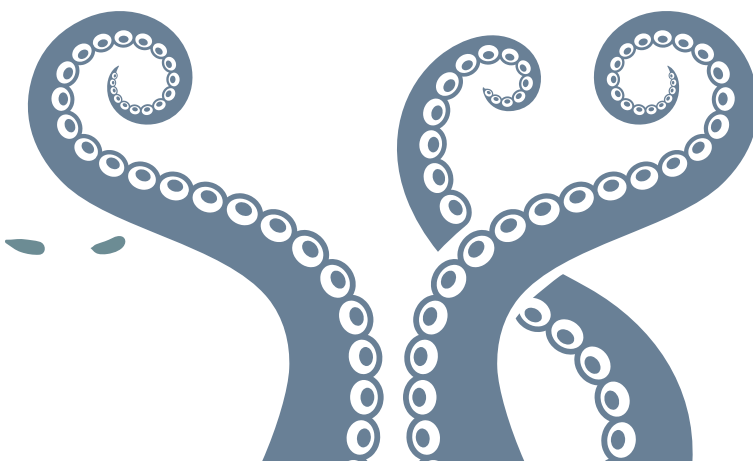
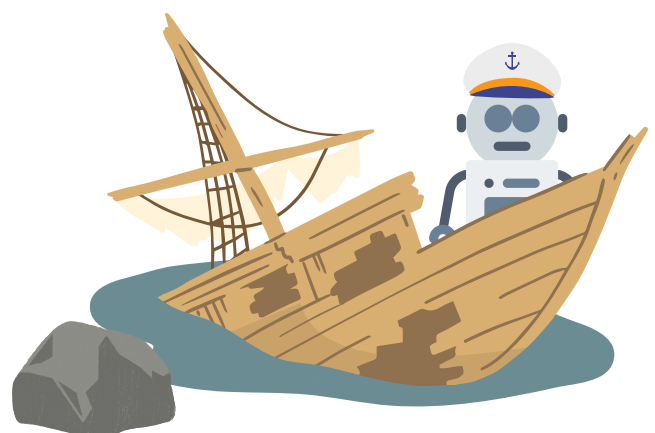
AI Notebooks

AI Training

AI Deploy



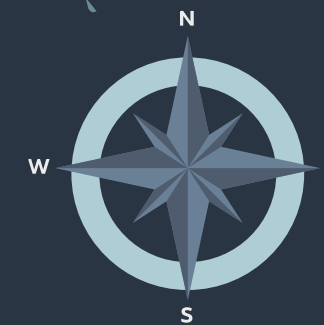
GPU / CPU



MERCI !





[HTTPS://OVH.TO/FRZNURP](https://ovh.to/frznurp)



POUR TESTER

 LE NOTEBOOK : <https://github.com/eleaptn/nemo-notebook>

 L'APP · <https://github.com/philippart-s/nemo-streamlit-front>
· <https://github.com/philippart-s/nemo-flask-back>

 QUELQUES DOCS · <https://docs.ovh.com/gb/en/publiccloud/ai/>
· <https://blog.ovhcloud.com/tag/ai/>

 QUELQUES EXEMPLES : <https://github.com/ovh/ai-training-examples/>

RÉFÉRENCES

- **TensorFlow** : <https://www.tensorflow.org/guide?hl=fr>
- **JupyterLab** : <https://jupyter.org/>
- **Pandas** : <https://pandas.pydata.org/>
- **Sklearn** : <https://scikit-learn.org/stable/>
- **Numpy** : <https://numpy.org/>
- **Matplotlib** : <https://matplotlib.org/>
- **Dataset des sons de mammifères marins** : <https://www.kaggle.com/datasets/shreyj1729/best-of-watkins-marine-mammal-sound-database>
- **Informations sur la dataset** : <https://cis.whoi.edu/science/B/whalesounds/index.cfm>
- **Classification de musique avec un CNN** : <https://blog.clairvoyantsoft.com/music-genre-classification-using-cnn-ef9461553726>
- **Classification des genre musicaux** : <https://towardsdatascience.com/music-genre-classification-with-python-c714d032f0d8>
- **Pré-traitement des données en Machine Learning** : <https://towardsdatascience.com/introduction-to-data-preprocessing-in-machine-learning-a9fa83a5dc9d>

