

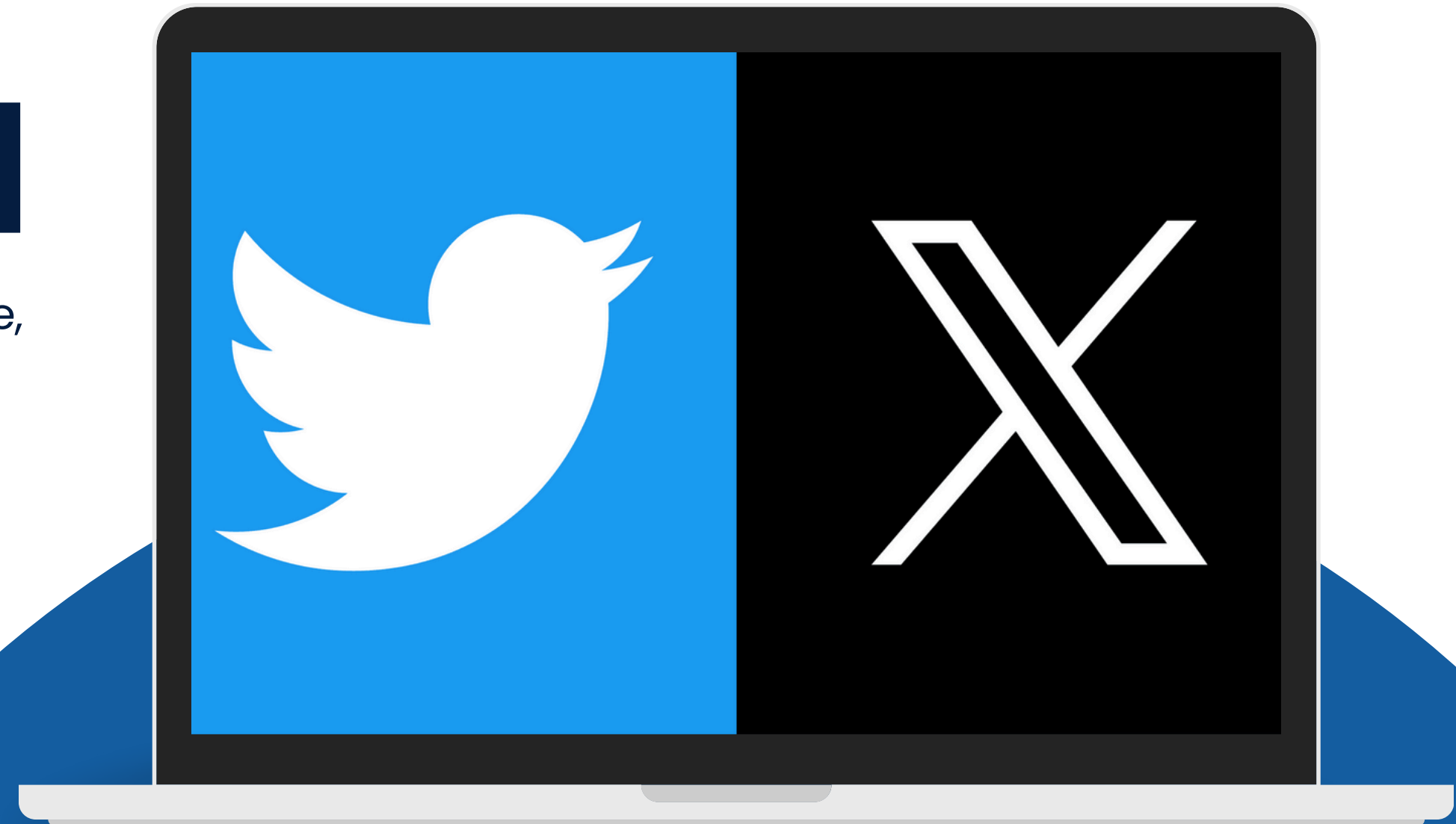


INM - EXPLAIN

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Janssen
Horizon



INTRODUCTION

- Projet académique - Master MIASHS
- Poursuite des travaux de thèse sur la controverse S.Benslimane - Apprentissage profond et Graphes pour produire un score de controverse
- **Notre mission** = produire des visualisations simples pour comprendre la controverse
- **Cas d'étude** : les INM un sujet très controversé

INTRODUCTION



Cannabis kills cancer. Medical marijuana is chemotherapy, natural style, for all cancer patients. The two forms of hemp oil, one with THC and CBD and the other CBD alone (which is pretty much legal everywhere) provide the body with chemo therapeutics without the danger and staggering side effects. The United States government is pathetic in its dishonesty about medical marijuana both believing in it and holding patents for its medical use and claiming at the same time that it has no medical use. The federal government and still many states would rather throw innocent people in jail for using medical marijuana than be honest about how much it can help people recover from cancer and other diseases. drsircus.com/medical-mariju...

[#cancer](#)

[#cannabis](#)

6:10 AM · May 9, 2024 · 396 Views

230

1202

7320



- **La controverse** : Discussion argumentée, contestation sur une opinion, [...] ensemble des éléments divergents ou contradictoires du débat. (*Centre National de Ressources Textuelles et Lexicales*)
- **Interventions non médicamenteuses (INM)** : intervention non invasive et non pharmacologique sur la santé humaine fondée sur la science (*Plateforme CEPS*)

INTRODUCTION



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Comment les visualisations de données peuvent contribuer à une meilleure compréhension des facteurs de controverses sur Twitter ?

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	Visualisations développées	3
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**Quelles sont nos
données ?**

Traitement de données



INM

Nombres de Tweets : 52 920
Likes : 7 209 886
Retweets : 2 048 663
Réponses : 623 221
Citations : 280 448



Traitement des données

- Tokenization
- récupération des hashtags
- suppression des users



- LDA
- Clustering et détection de communautés
- analyse de sentiments
- classification d'opinions
- indice de controverse

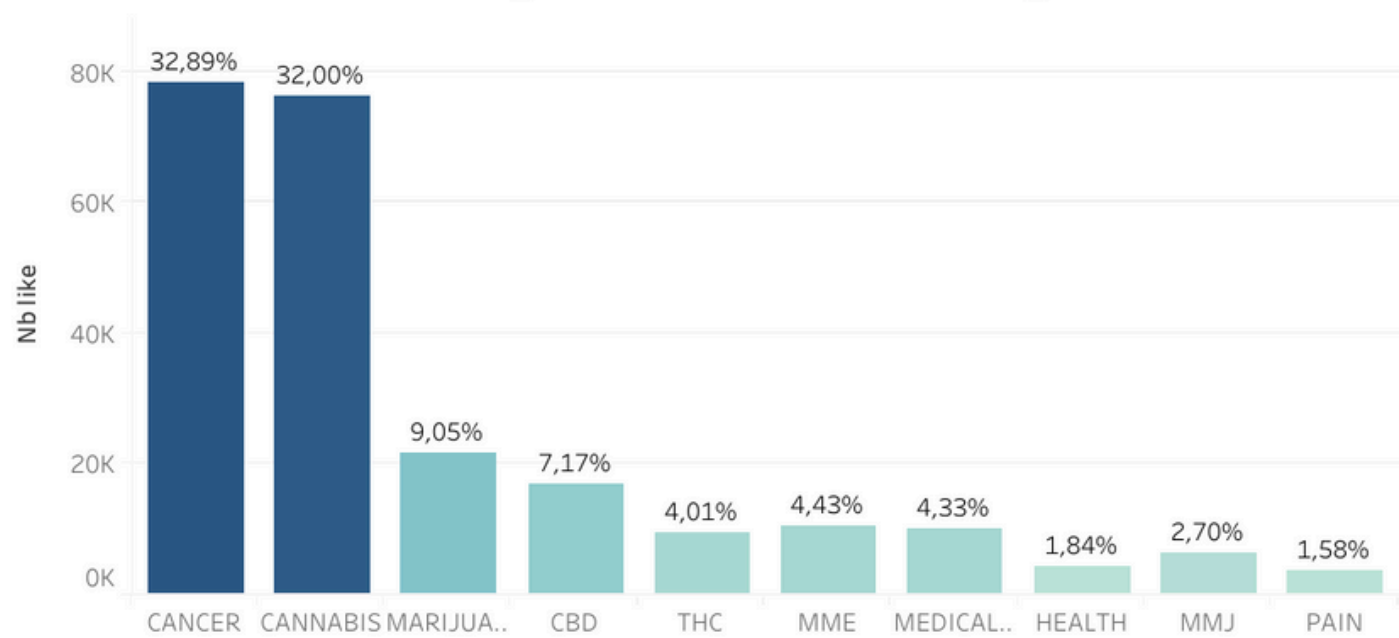


**Comment
explorer les
données ?**

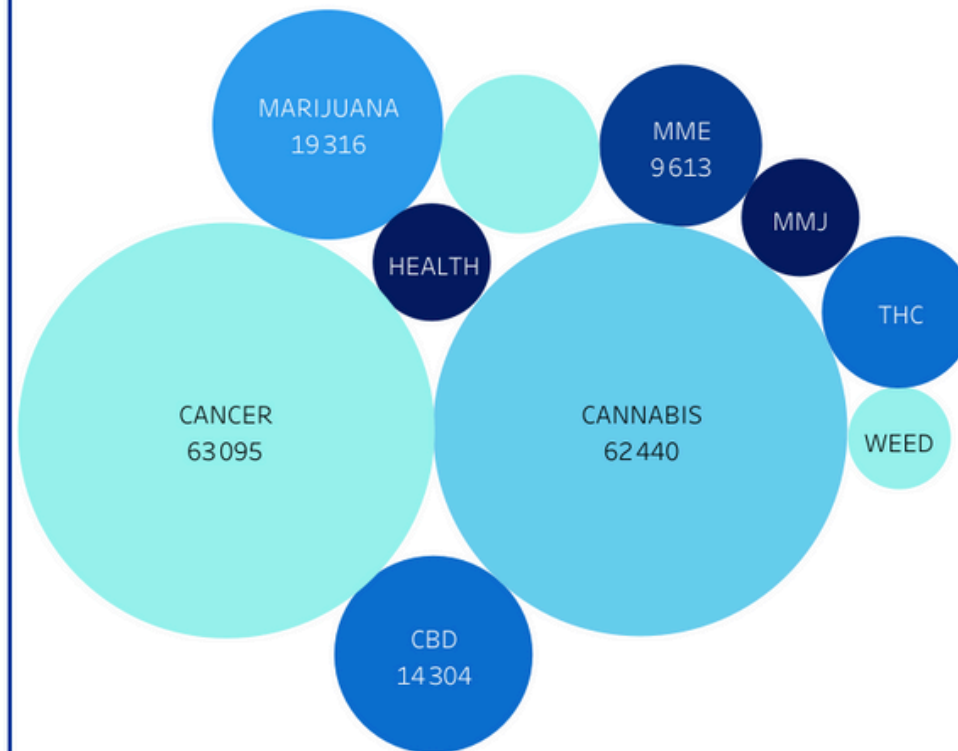
Premières explorations

NMI Analysis

Percentage of likes based on hashtag



Quantity of retweets according to hashtag



Aggregate metrics

Sum of number of likes	443423
Sum of retweet counts	350889
Sum of number of answers	27651
Sum of citation counts	10839

Frequency of hashtag appearances

Hashtags Scin..	Frequency
CANCER	55210
CANNABIS	52540
MARIJUANA	18723
CBD	13817
THC	8527
MME	7422
MEDICALMARIJUANA	7265
HEMP	5333
HEMPOIL	3864
HEALTH	3578

Top hashtag combinations

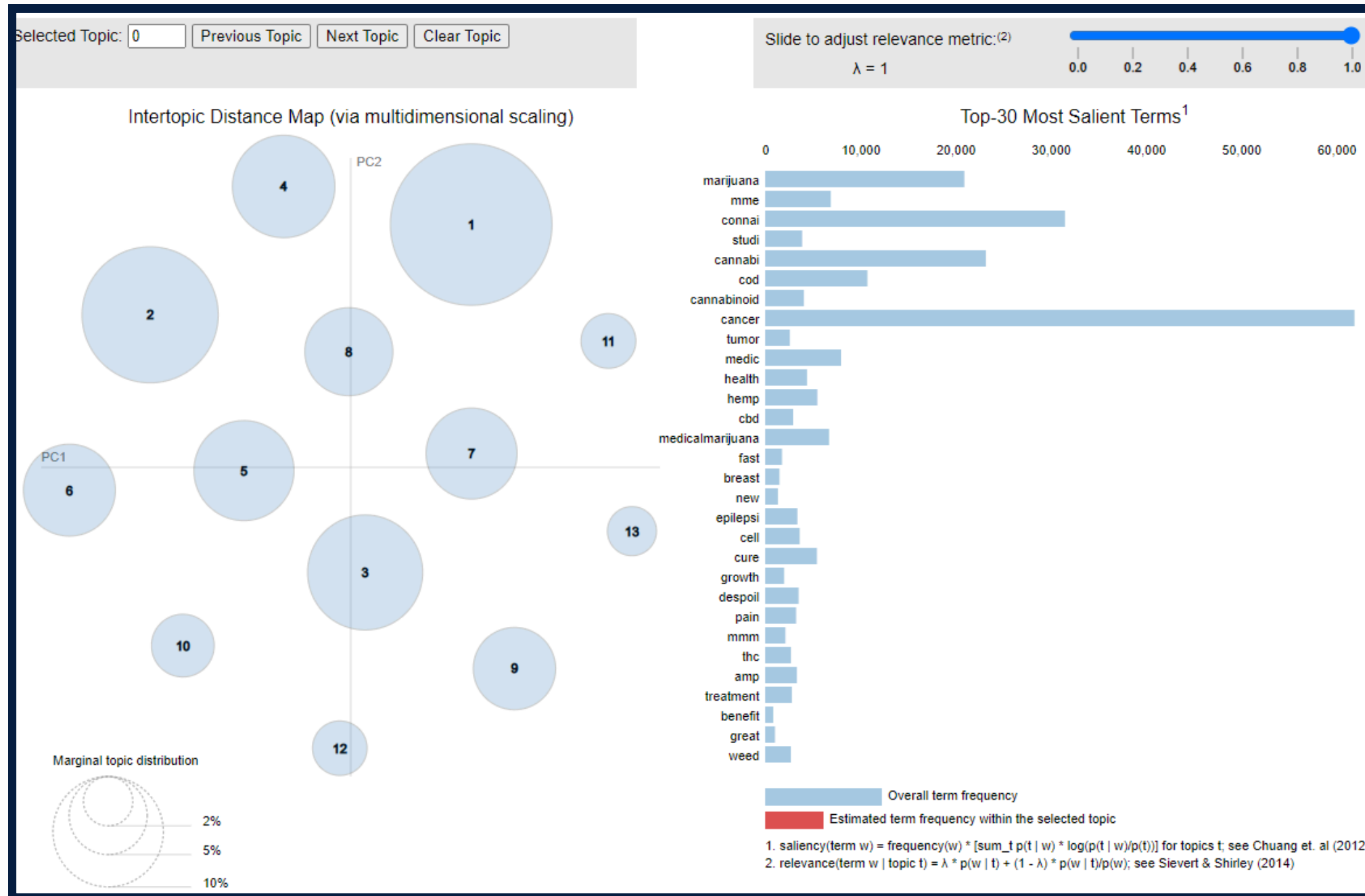
Hashtags	Count
['#CANNABIS', '#CANCER']	11946
['#CBD', '#HEALTH', '#CBDOIL', '#HEMP', '#CANNABIS', '#W..']	9072
['#CANCER', '#CANNABIS']	4960
['#THC', '#CANCER', '#POT', '#CANNABIS', '#WEED']	3550
['#CBD', '#HEMP', '#CBDOIL', '#CANNABIS', '#HEALTH', '#W..']	3200
['#CBD', '#CBDOIL', '#HEMP', '#CANNABIS', '#CANNABIDIO..']	3200
['#THC', '#CBD', '#CANNABIS', '#WEEDOIL', '#MMJ', '#WIET..']	2940
['#CANNABIS', '#CANCER', '#BREASTCANCER', '#BREASTCA..']	2480
['#MME', '#MARIJUANA', '#CANNABIS', '#MEDICALMARIJU..']	2430
['#WHYINTHEWORLD', '#CANNABIS', '#PTSD', '#CANCER', '..']	2400

- visualisations Tableau
- **#CANCER**
#CANNABIS des "top hashtags"



**Quelles sont les
thèmes des
textes traitant
d'INMs?**

Latent Dirichlet Allocation - Topic Modeling

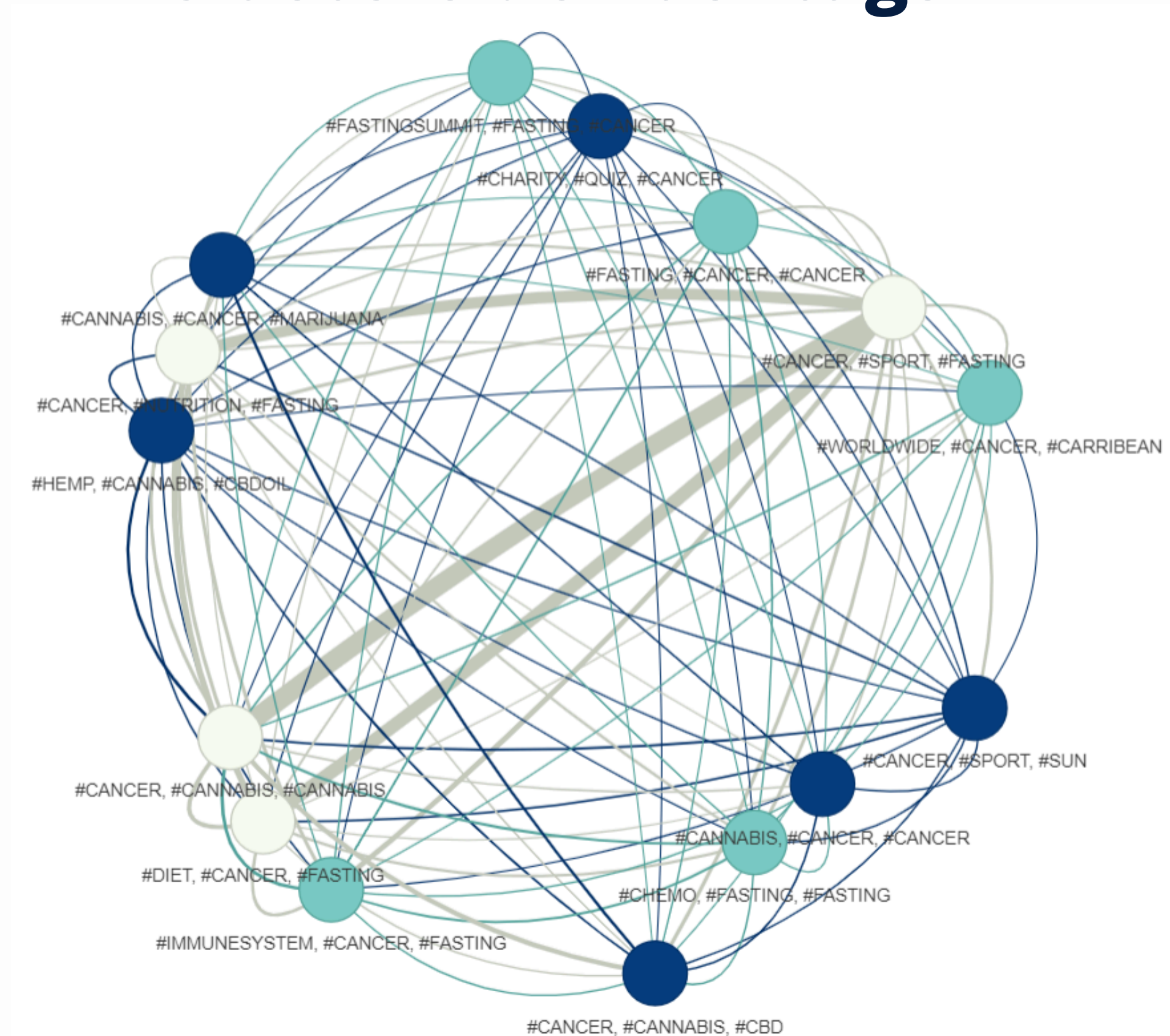


Label	Top Words
Treatment with Cannabis	[cancer, cannabi, connai, cell, marijuana, cure, studi, treatment, cannabinoid, kill]
Diet and Intermittent Fasting	[cancer, cannabi, breast, connai, breastcanc, analysi, extens, v, sport, wast]
Health Benefits of Cannabis	[cancer, health, daili, connai, cannabi, latest, benefit, cbd, hemp, ill]
Medical Marijuana Usage	[cancer, connai, cannabi, marijuana, leukaemia, medicalmarijuana, mmm, health, medicine, cod]
Research on Cancer Prevention	[cancer, connai, cannabi, amp, pain, fight, effect, growth, patient, cell]
Health and CBD Oil Usage	[cancer, connai, cb, cod, hemp, list, mmm, e, wietoli, weedoil]



Comment expliquer les interactions entre les utilisateurs au sein de communautés ?

Détection de communautés au sein de Clusters de hashtags



- liens entre les hashtags dans les tweets
- 2 391 tweets représentés (1.5%)
- un noeud = un cluster = un groupe similaire
- **K-means Clustering**
- La couleur représente les communautés
- **algorithme de Louvain**



**Existe-t-il un lien
entre les sentiments
et la controverse ?**

Sentiment Analysis with



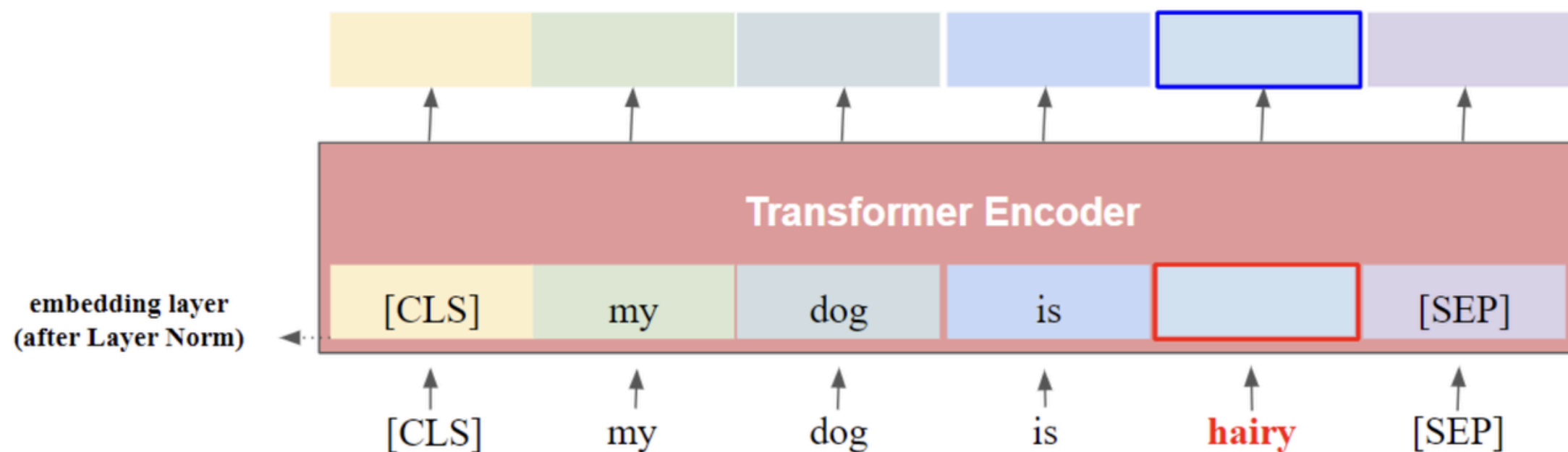
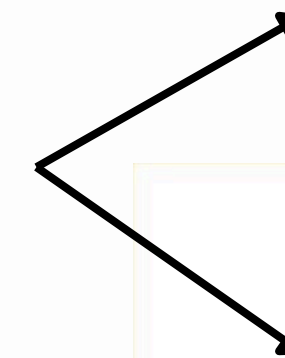
Hugging Face

RoBERTa

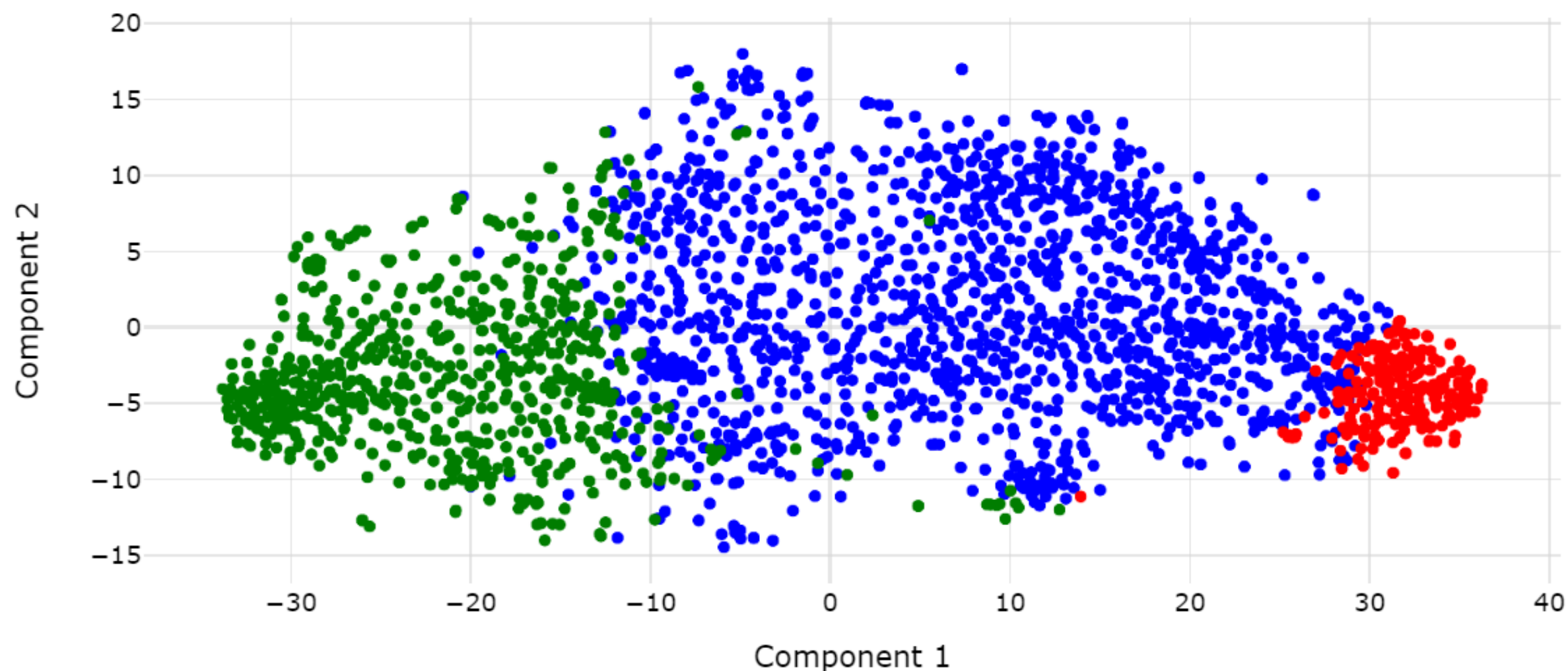
- Compréhension Bidirectionnelle
- Modélisation du langage masqué (MLM)
- Prédiction de la phrase suivante (NSP)

How ?

∞ Meta



t-SNE Visualization of Feature Spaces for Sentiment Analysis



Sentiment

- neutral
- pos
- neg

POSITIVE

- **We found that almost 25%-35% of the #mice were completely cured of #cancer after administering #Cannabis.**



- **Medical Marijuana Helped Save This Child From #Cancer**
<https://t.co/My5dO4ksKR>
#marijuana #cannabis #MME #Cancer http

NEGATIVE

- **While #Cancer is big business for some, it's a business that only exists because the #Cure is illegal. #Cannabis...**
- **It doesn't matter to me if you smoke it or take drops, just think we are healthier, saving the environment, and tax payer money, Fk big pharma. #cannabis #cbdoil #hempoil #stress #ibs #cancer #anxiety #organic #facialcream #painrub #sleep #arthritis #fibromialgia #insomnia**



**Peut-on classifier les
tweets selon
l'opinion exprimée ?**

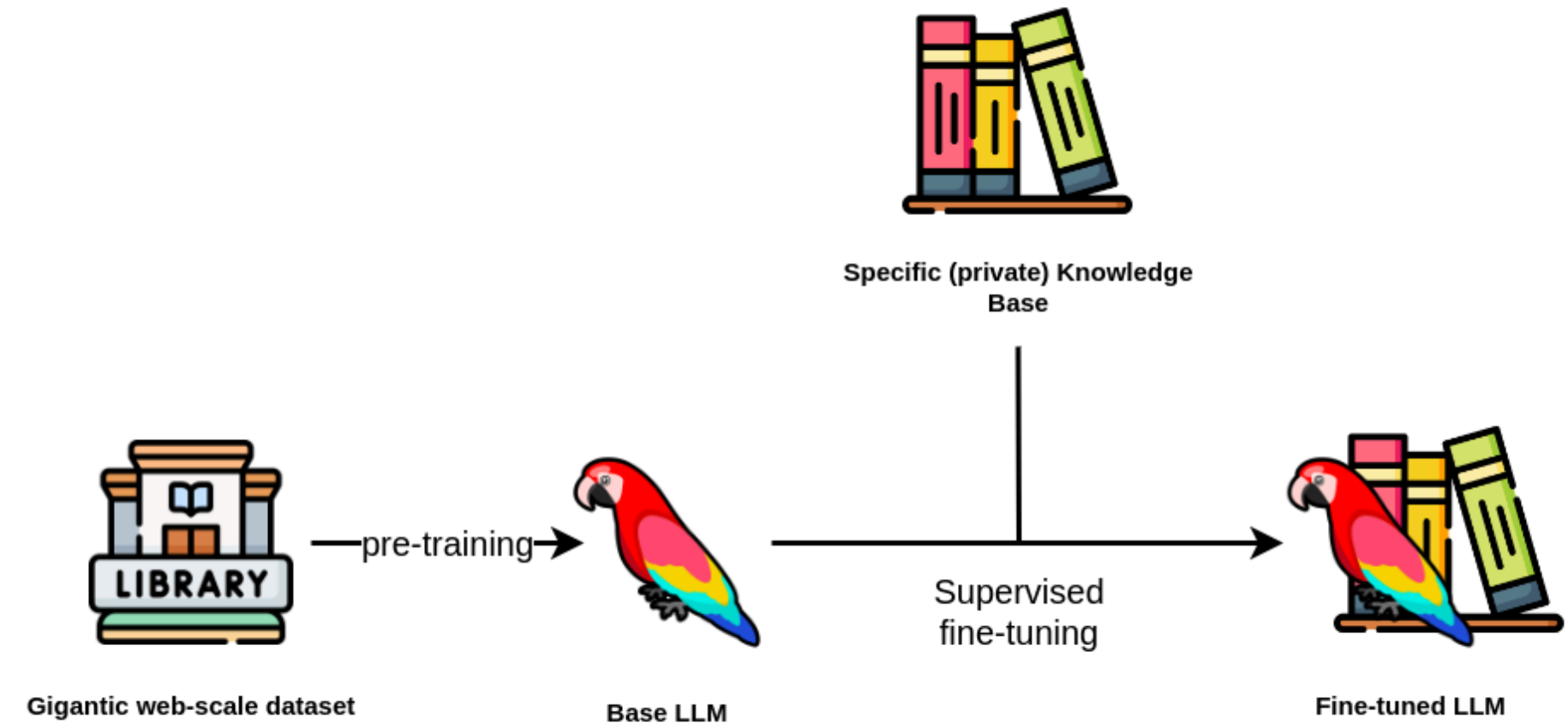
Classification d'opinions



Hugging Face

**Modèle Pré-entraîné : google-bert/
bert-base-uncased**

- Base d'entraînement : **80% (450 tweets)**
- Base de test : **20% (50 tweets)**
- **3 époques**
- Labélisation : **PRO, ANTI, NEUTRAL**



**Déséquilibre de classes
ANTI MINORITAIRE !**

PRO: Cancer patient: 'I had to become an outlaw or die' <https://t.co/iKhdQt4MDR> via @user #MME #Cancer #Cannabis <http>

ANTI: New research suggests that #cannabis extract can have a "dramatic effect" on brain #cancer. <http> #breakthetaboo

Classification d'opinions Hugging Face

Accuracy Globale : 86%

Précision	Valeur
PRO	0.971
ANTI	0.500
NEUTRAL	0.643

**Problème pour la classe
ANTI - MINORITAIRE**



1. **DATA AUGMENTATION**
2. **LOSS pour gérer le déséquilibre de classes**
 - Weighted Categorical Cross-Entropy Loss
 - Focal Loss



**Comment
quantifier la
controverse ?**

Indice de Controverse

Tweet characteristics :

Retweets : 24

Likes : 13

Comments : N/A

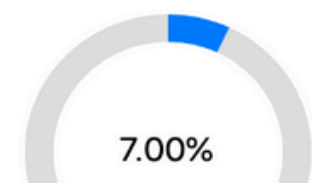
Quotes : N/A

Positivity : 0.0445

Negativity : 0.0819



Calculate



- Métrique essentielle
- **Plusieurs facteurs de controverse numériques normalisés entre 0 et 1**
- **Somme pondérée des poids choisis par l'utilisateur.**



**Où trouver
nos
recherches ?**

🔍 [http://advanse.lirmm.fr/template_container.php?
template=AD/Controverse.php](http://advanse.lirmm.fr/template_container.php?template=AD/Controverse.php) ✕

INM-EXPLAIN

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Medical controversies, present on social media, bringing to the fore heated debates, differences of opinion, contradictory interpretations of scientific evidences, etc. Some medical controversies are ethical issues with direct implications for public health. In this website, we describe the INM- Explain tool for exploring and quantifying these controversies, and apply it to the case of non-drug interventions. Down below, we can find the top 100 most used words in our dataset. This project was created as part of a guided research project in the first year of a Master's degree in Mathematics and Computer Science applied to Humanities and Social Sciences by five students : Alya ZOUZOU, Audric GIRONDIN, Maéva MAIO, Jonathan DUCKES, and Houria SAYAH, with the help of Samy Benslimane's Thesis. The supervision was provided by Sandra Bringay and Maximilien Servajean. This project is the result of a collaboration between the Janssen Foundation, the French National Centre for Scientific Research (CNRS), and the Laboratory of Informatics, Robotics, and Microelectronics of Montpellier (LIRMM).

[Master 1 MIASHS](#) [GIT](#) [CNRS](#) [LIRMM](#) [JANSEEN FONDATION](#)

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Perspectives et Discussions

- **Amélioration des visualisations descriptives** : Ajouter des interactions pour naviguer dans des sous-ensembles de tweets (mots clés, nombre de retweets, etc.).
- **Affiner l'analyse de sentiments** : Lier les thèmes aux tweets de chaque groupe dans la visualisation TSNE.
- **Analyse temporelle** : Explorer dans le temps les sujets controversés.
- **Cas d'étude et perception des INMs** : Généraliser l'outil INM-Explain à d'autres sujets controversés et réseaux sociaux (Threads, TikTok).



CONCLUSION



- **Cannabis** : Focus sur le cannabis et ses dérivés, rôle central et demande de reconnaissance légale.
- **Analyse des sentiments** : Variété de perceptions, réception mitigée des thérapies alternatives.
- **Controverse** : Besoin de discussions informées pour orienter les politiques de santé publique.
- **Communication** : Importance de la communication scientifique et de l'engagement des professionnels de santé.



MERCI !



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