



Explore large datasets of images with

# Panoptic

Panoptic Achieves Numerical Organisation of Pictures Through Interactive Computing

FOSDEM - Open Research

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# Summary

- Introduction
- What's panoptic
- Research Use Cases
- Architecture and Plugins

What's Panoptic ?

Dossiers

- mythology 1218
- Gorgones triées 306
- photo\_Gorgone 638
- photo\_Cheval\_ailé 61
- photo\_Cheval\_marin 2
- photo\_Monstra 7
- photo\_Nereides 158
- photo\_non\_classées 14
- photo\_Oceanos 5
- photo\_Scylla 7
- photo\_Sirene 17
- photo\_Triton\_Ichthyo 7

Propriétés

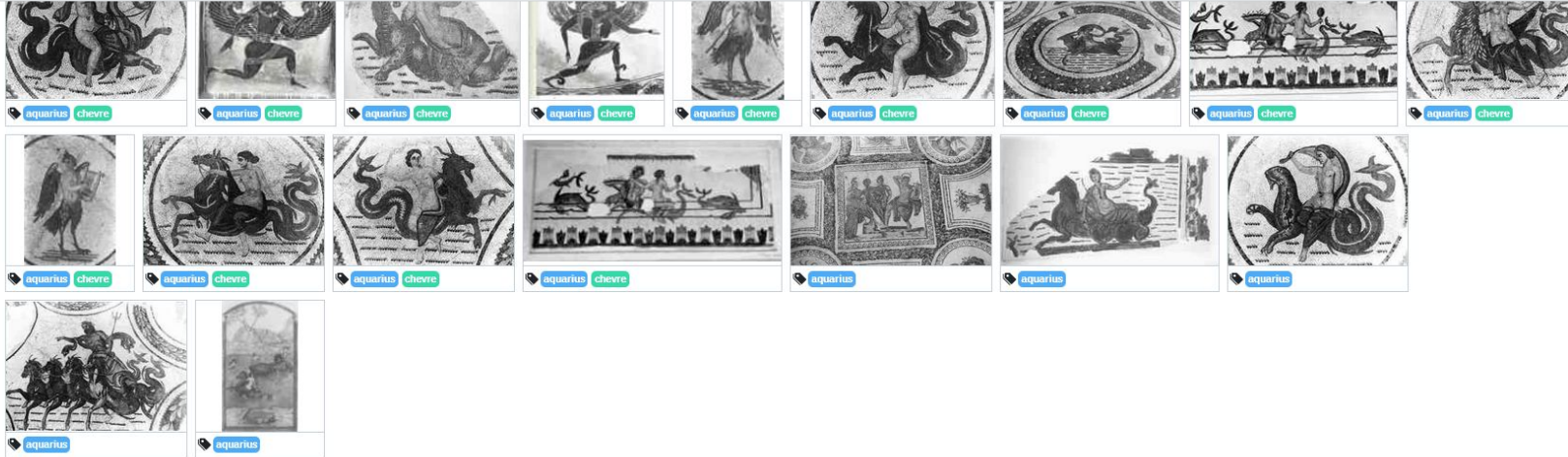
- tags
- + Nouvelle propriété
- + Nouveau Groupe

Propriétés Panoptic

- ID id
- # sha1
- # average hash
- folder
- width
- height
- path

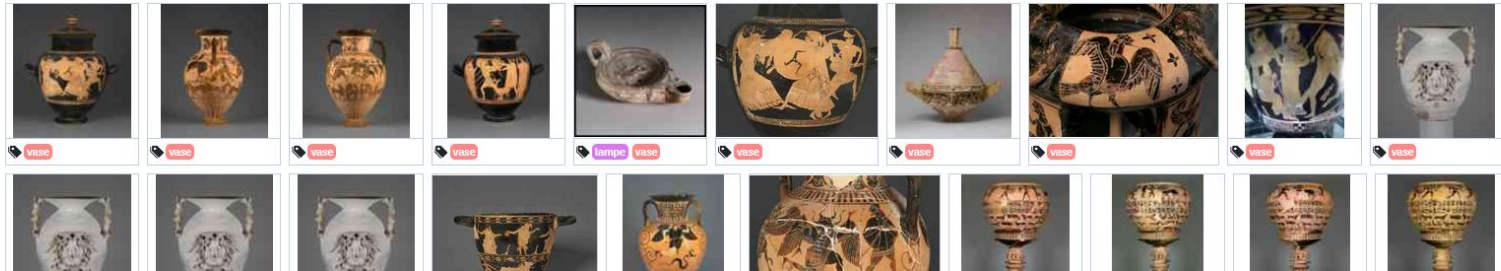
Chercher par texte

Filtrer: + Grouper: + Trier: +



Cluster 1 17 88 Images

Tagger le groupe Créer des clusters Exécuter



## A bit of context

- Software for dynamic exploration of medium and large datasets : 100 → 100k (1M?) images on YOUR computer.
- In development since May 2023.
- Open source: everything is on Github.
- Two software engineers, a research designer, and a humanities research engineer

# Origin

- Media studies researchers working on Twitter image datasets too big for manual analysis
  - How to analyze the circulation of similar images, even when they are slightly different ?
  - Hard to know exactly what's in a big dataset.
  - Tropy is great for manual analysis but lack of automatic assistance
  - Great ML tools existing but need to know how to code and not easily usable to explore and annotate along
- Need of a real exploration UI assisted with ML tools

# Quick Demo

- Properties
- Filters, Groups, Sorts
- Clustering
- Similarity
- Recommendations
- Export everything

some Panoptic use cases



# Current use cases

- Exploration of large web corpora
- Exploration of large digitized corpora
- Exploration of film corpora

# Exploration of large web corpora

Examples :

<i>Social network</i>	<i>Subject</i>	<i>Number of single images</i>	<i>Number of publications</i>
Twitter & Facebook	The circulation and problematization of images of police violence on social networks during the Yellow Vests protests.	31 698	301 655
Twitter	The spread of the racist ideology of “grand remplacement” on social networks and its vernacular visuals	50 783	145 094
Twitter	Development of specific vernacular visuals by the anti-genre movement between 2013 and 2021	19 703	139 815
Instagram	The fan culture around Eurovision	64 702	65 814
TikTok	Information production formats for news stories and their politicization	6 234	6 234

# Exploration of large web corpora



ID: 34678 | 1200 x 1200 | a945f6634a264fb673966d63b3d8437e9f8d8e3.jpg

Images similaires Propriétés des instances

Images Similaires (0.5 - 1) (18385 images)

Search function PanopticML.find\_images

▼ Propriétés d'image

- Type ? image
- Description image: Indication d'une source institutionnelle/sondage, Indication d'une source médiatique, Sondage, Inutilité de sondage, Image campagne Zemmour 2022
- Image intéressante ?

▼ Propriétés de l'instance

- Texte du tweet: @SylvLab @mvalet\_officiel La plupart des Français ne vote pas selon ce qu'ils pensent mais selon ce qu'on leur dit de voter. #Remigration https://t.co/DQvZRMpGsd
- id\_tweet: 1587417081380757500
- author\_user: Cartier7Clement
- created\_at: 2022/11/01 13:11:39
- Description usage: Vide...

▼ Propriétés Panoptic

- ID id: 34678
- # sha1: fbof9653fbd976f7f46f692ab63b17211c30ff
- # average hash: 7f3f31f3b000000
- folder: grand\_remplacement\_complet
- width: 1200
- height: 1200
- path: D:\Documents\_D\Ceres\Chantiers internes\Chantier Images\Grand Remplacement\export\_restweet1\_images\_exported\grand\_remplacement\_complet\945f6634a264fb673966d63b3d8437e9f8d8e3.jpg

The main area displays a grid of 18385 similar images. Each image is a small version of the original poster, featuring a blue background with white and red text. The text includes a large percentage (e.g., 53%, 72%, 94%) and the name 'ERIC ZEMMOUR'. The grid is organized into rows and columns, with each image having a small numerical score in the top left corner.

Edouard Bouté's thesis  
& CERES corpus

# Exploration of large digitized corpora

The screenshot displays a web application interface for exploring digitized corpora. The main area shows a large image of a mechanical device, likely a steam engine or similar industrial machinery. To the left of this image is a metadata panel with the following information:

- ID: 74 | 3199 x 2508 | FRAN\_0348\_02619\_L.jpg
- Propriétés d'image
- Propriétés de l'instance
- Propriétés Panoptic
- ID id: 74
- # sha1: 26afd3fc7142840efcb5c116806b7ad949819f5
- # average hash: fffff781000061
- folder: FRAN\_0348\_386AP\_04
- width: 3199
- height: 2508
- path: D:\Documents\_D\_Ceres\Accompagnements\_exterieurs\BNF\_PACK Analyse et enrichissement (archives nationales)\Album s Jules Breton\Fonds Jules Breton\UPEG10\FRAN\_0348\_398 AP\_04\FRAN\_0348\_02619\_L.jpg

On the right side, there is a search function labeled "PanopticML find\_images" and a "Propriétés des instances" section. Below this, a large grid of 1813 smaller images is displayed, each with a small numerical value (e.g., 0.99, 0.98, 0.97) indicating similarity or relevance. The grid is organized into rows and columns, showing various views and details of the main image's subject matter.

BNF's archives: Fonds Jules Breton

# Exploration of film corpora



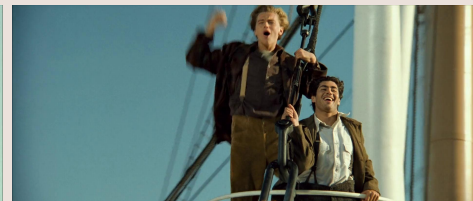
Titanic\_00h\_32m\_19s.jpg



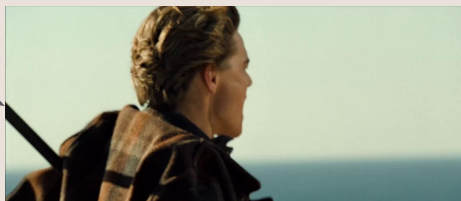
Titanic\_00h\_32m\_24s.jpg



Titanic\_00h\_32m\_29s.jpg



Titanic\_00h\_32m\_34s.jpg



Titanic\_00h\_32m\_39s.jpg



Titanic\_00h\_32m\_44s.jpg



Titanic\_00h\_32m\_49s.jpg



Titanic\_00h\_32m\_54s.jpg





→ Spot and identify the visual codes of a filmic genre, for example, here, repeated shot compositions throughout my corpus

*Becoming Jane* (2007), *Emma.* (2020)  
*Lost in Austen* (2008), *Northanger Abbey* (2007)  
*Pride and Prejudice* (2005), *Pride and Prejudice* (1995)

Léa Andolfi's thesis  
(Sorbonne Université)

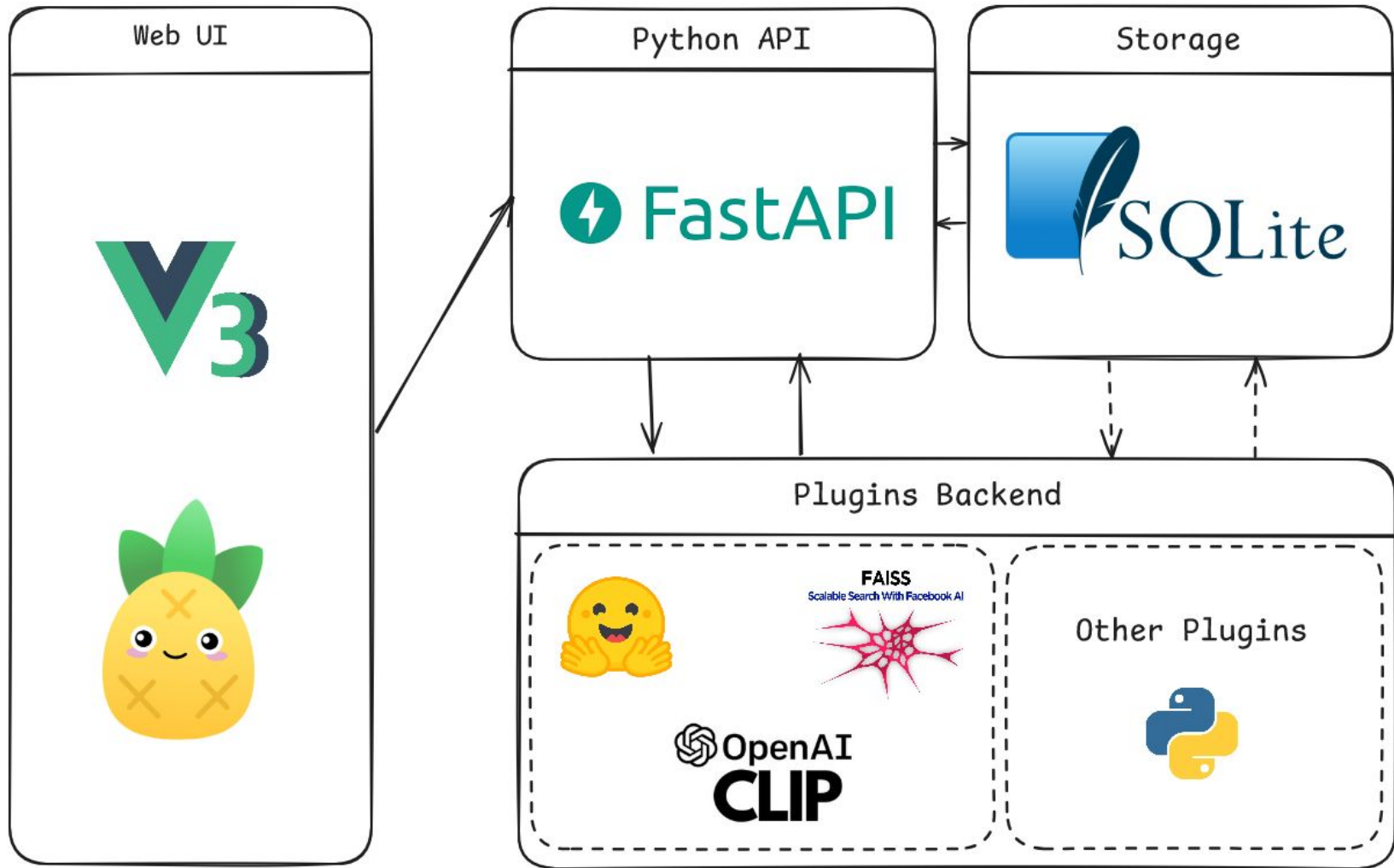
# Architecture and Plugins

# Panoptic Architecture

## Requirements:

- Runs on Linux / Windows / MacOs
- Should be “easy” to install: `pip install panoptic`
- Allow plugins for ML algorithms
- Work locally





# Database: Sqlite

- No DB server to setup
- One File contains all data
- Easy to share / backup
- SQL based

# Backend: Python

- Multi OS support
- Easy to load plugins
- PyTorch

# Frontend: WebUI (vue3)

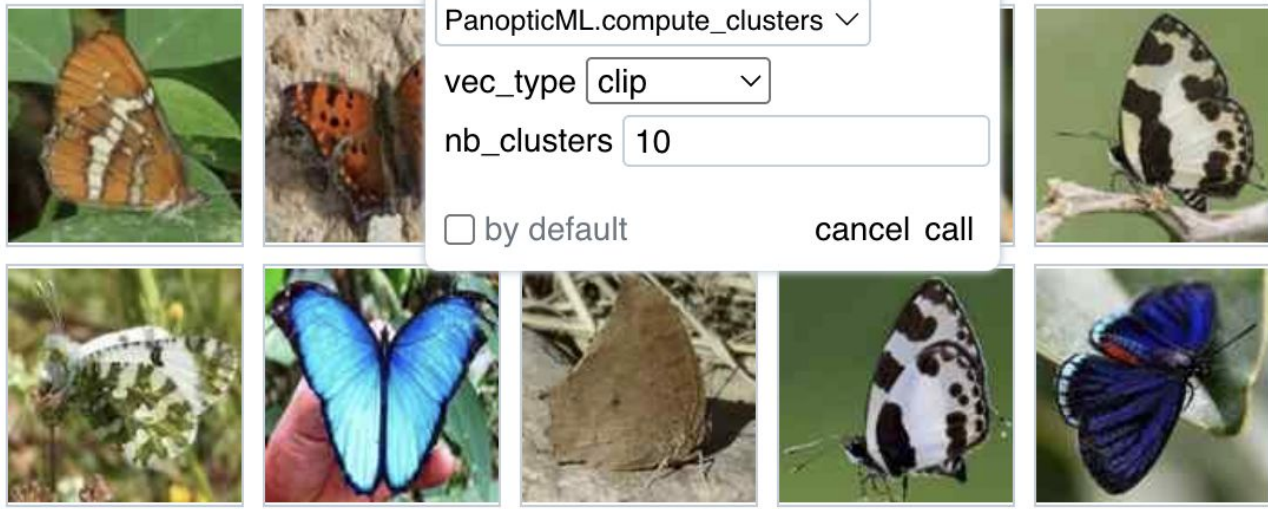
- Everyone has a browser
- Unified UI experience on every OS
- Remote access by default
- No heavy UI library to install

# Plugins

- Customize Panoptic for your needs
- Possible Actions: Cluster, Similarity, Execute
- Example: Clustering of Memes: Image + Text

# Plugins: Clustering

▼  **All** 2309 Images Tag the group Create Clusters ▼ Run ▼




The image shows a grid of butterfly photos. A configuration overlay is centered over the grid, displaying the following settings:


- Plugin: PanopticML.compute\_clusters ▼
- vec\_type: clip ▼
- nb\_clusters: 10
- by default
- cancel call


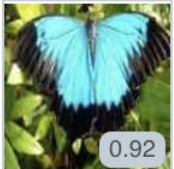


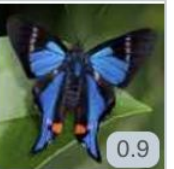

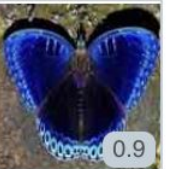
```
def compute_clusters(self, context: ActionContext, vec_type: VectorType = VectorType.clip, nb_clusters: int = 10):
```


# Plugins: Similarity




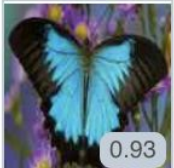


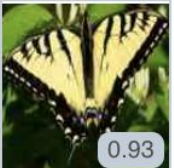
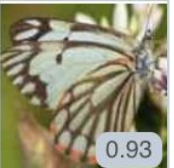
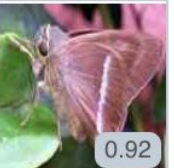
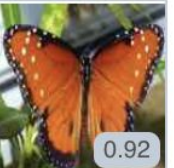
✓ |  | Images Similaires  (0.5 - 1) (1185 images) ⓘ

Search function  

 0.92	 0.92	 0.91	 0.91	 0.9	 0.9	 0.9
--	--	---	--	---	---	---

✓ |  | Images Similaires  (0.5 - 1) (2079 images) ⓘ

Search function  

 0.93	 0.93	 0.93	 0.93	 0.93	 0.92	 0.92
---	---	--	---	---	---	---

# Plugins: Execute

▼  All 4075 Images

Tag the group

Create Clusters | ▼

Run | ▼





Questions ?

SCAN ME



<https://github.com/CERES-Sorbonne/Panoptic>