

Data Driven Narrative Temporal Analysis

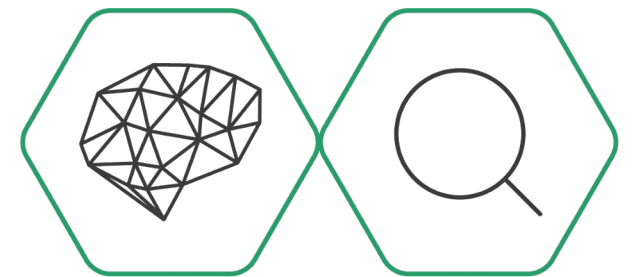
Xingyi Song, USFD

Martin Hyben, KlnIT

Andrey Tagarev, ONTO

24/06/2025

VERA.AI Outcome Event



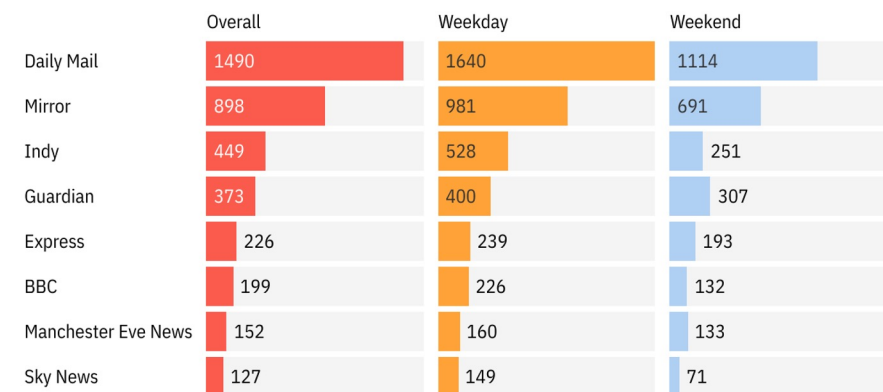
vera.ai

Temporal Analysis

- Studying how topics, documents, and their relationships change across time slices.
 - When did a topic surface?
 - How long did it stay?
 - What preceded or followed?
- The amount of information require data driven method to aid the analysis

Mail Online publishes over 1600 stories daily on weekdays

Average number of articles published per day, 13-19 September

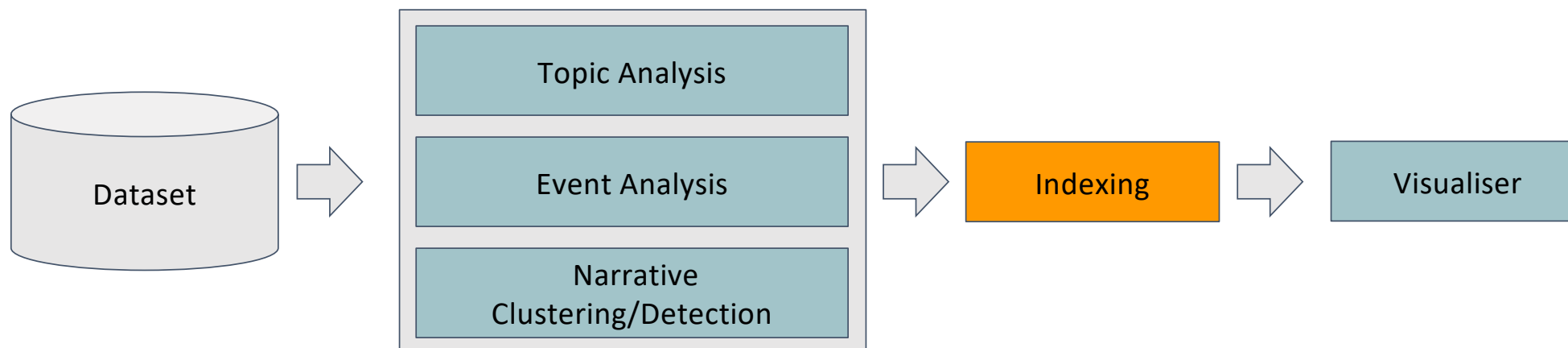


Source: Press Gazette research using publisher RSS feeds

PressGazette

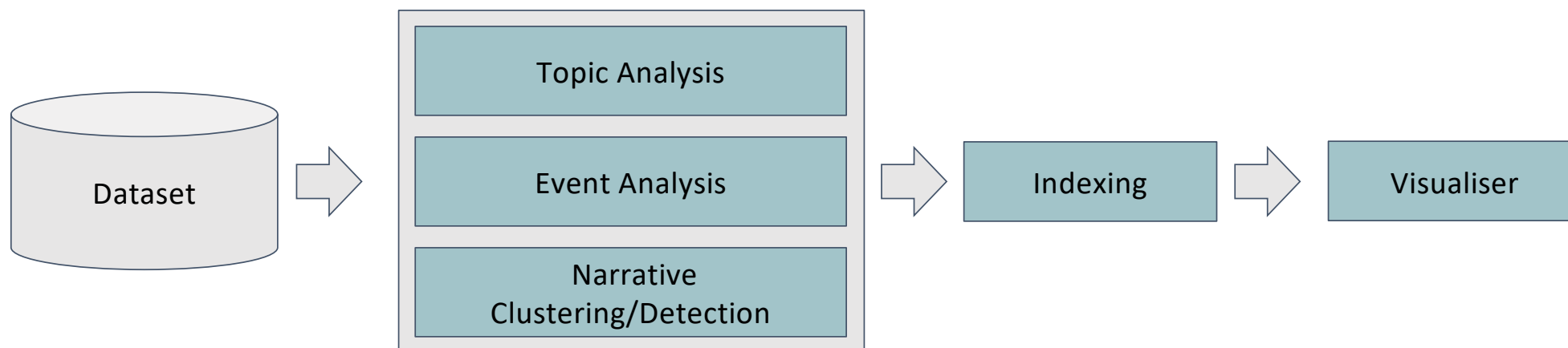
<https://pressgazette.co.uk/media-audience-and-business-data/at-1500-stories-per-day-mail-online-is-uks-most-prolific-news-website/>

Narrative Features



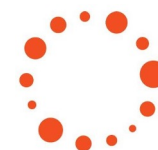
doc_id	text	Topic	Topic hierarchy	Cluster	Location
1	"Hainan Welcomes Sally: Preparing to Take the Lead as a Cadre Who Stands Firm Against the Wind"Headline: Preparing to Face the Wind: ...	Hainan Island Typhoon Sally	L2: Typhoons L1: Natural Disasters	1	Hainan	
2	"Hunan's Double 11: Over 170 E-commerce Enterprises in Longping High-Tech Zone Unite for Battle""A Small Space Writes a Big Story" - Insider Report on the	E-commerce Enterprises Zone Development	L1: E-commerce Industry	2	Hunan	

General Architecture



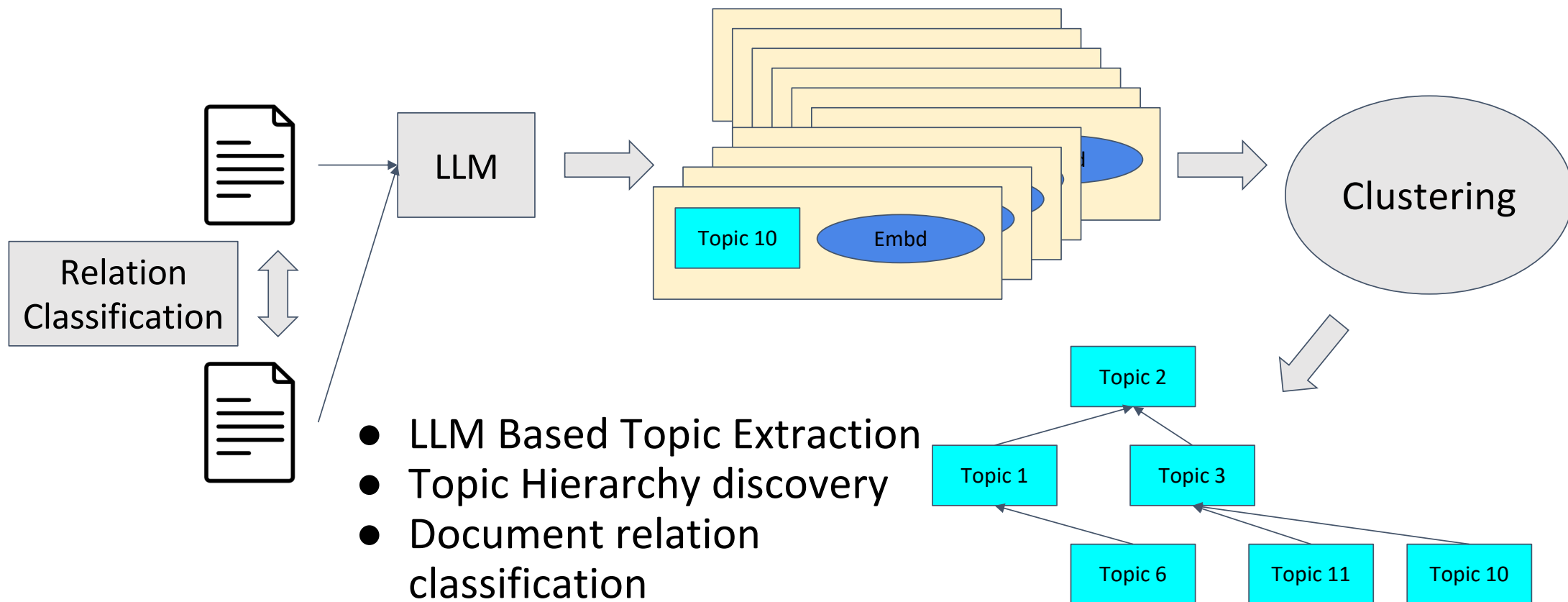
University of
Sheffield

kinit



ontotext

USFD - Topic Discovery and Temporal Analysis



USFD - Topic Discovery and Temporal Analysis



- API and UI available
 - <https://cloud-api.gate.ac.uk/process/topic-analysis>
 - <https://temporal-analysis.demos.gate.ac.uk/>

[cloud.gate.ac.uk/process/topic-analysis](https://cloud-api.gate.ac.uk/process/topic-analysis)

Test this pipeline

Type the content to annotate:

This quarterly performance of the Shenzhen real estate market is flat, with inventory pressure easing between the third and fourth quarters in 2016. In Beijing, the traditional period of the real estate market peak has ended. In the early part of the third quarter of 2016, major real estate projects in Beijing were busy preparing for the traditional peak season of the Chinese property market.

Or select a text file:

Choose file No file chosen

Output type: JSON

Document format: plain text

Submit to pipeline

Download

Annotations at this location

Annotation type: Document Topic Topic

Document topic: Real Estate Market

Label: 65.0100212000000000

Document topic: Shenzhen Market

Label: 4.6158447810400000

Document topic: Property Market

Label: 1.518461009715100000

her in Changsha is like a sudden cold wind that comes at night, changing the season and asking how winter will come again. Winter is idly, changing the season, and what about the winter that's coming? Just before "Little Snow" new client in Hunan, November 7th porter Ou Yang Qian) Winter comes and summer departs, autumn harvest and winter storage, and it's time for the winter solstice. asures" being shunned? The new policy in Jinan's real estate market is too soft, whether it's effective remains to be seen until the end of yesterday, the Shandong Municipal Bureau of Land and Resources issued 15 parcels of construction land use rights, which will serve as ground for the "Shan Eight Measures" aimed at controlling the land market. Reporters noted that the 1450 mu of land up for auction 1266 mu of residential land, with some plots located in the "Metro Mansion" area of the city's hot eastern districts, and it is unclear how is will be traded when they are auctioned off.

is of the fish don't scatter, half of Fuzhou was startled by last night's storm! With two typhoons lined up for the National Day holiday, how reckless! The fish is already dead, and the tail is still heavily sweeping Fuzhou. Last night, half of Fuzhou city was woken up by the 7.

it's Favorite Song from Wuhan University Campus: 2016 The article was reported by NetEase Entertainment on October 28th. The film "The Silence" campus roadshow at Wuhan University yesterday, warming up the global premiere on November 4th.

Samsung Galaxy Note7 still has stock: Are you genuinely interested in buying what I have in stock? Samsung Global Hits Sales and 30,000 Units of Note7 in China; Chengdu Stores Still Selling On October 11, Samsung announced that the "explosive door" of the Note7, which has been ongoing for over a month, seems to finally be closing. On October 11, Samsung Electronics stated that it will oblige operators and retail partners worldwide to stop selling Note7 phones and ask Note7 users to turn off their phones and stop using

in Nanjing's Waterfront Confirmed! Do You Know Where the People of Jiangning Live Closest? The Silk Road Maritime Route is "Confirmed" Do you know where the closest one to Jiangning is?

Delivery Package Journey: A Zero-Distance Direct Hit on the Logistics Industry "Cutting-edge Party" buys all the treasures here. Wang Jing took photos on the 12th, at the sorting center of the express delivery company, where employees were sorting packages on a automated assembly line.

it's Beauty Salon Scandal: Unqualified Treatment and Deception! Title: Shanghai Municipal Health Organization Inspects "Jiaoshu" Chain Shanghai Jiaoshu claims to be a nationwide institution for foot health, capable of treating conditions such as gray nail, goose foot wind, among others. In September, a Morning Post reporter conducted an undercover investigation at some Jiaoshu chain stores and found

Seasons 30.882352828979492%
Winter 30.882352828979492%

Land Use Rights 37.96296310424805%
Jinan City 33.33335876464644%
Real Estate Market 28.703704833984375%

Fuzhou 35.71428680419222%
Weather 32.14285659790039%
Typhoons 32.14285659790039%

Campus Event 46.1538461740722656%
University 41.02564239501953%
Song 12.820513725280762%

Samsung Note7 54.83871078491211%
Samsung Electronics 45.16128921508789%

Jiangning Location 57.57575607299805%
Nanjing Waterfront 42.42424392700195%

Logistics Industry 58.695648193359375%
Automated Assembly 21.7391300201416%
Delivery Packages 19.565217971801758%

Shanghai Municipal 41.558441162109375%
Beauty Salon 38.961036682128906%
Healthcare Violations 19.480518341064453%

Travel Destination

E-commerce

Healthcare Violations

Healthcare Violations

Healthcare Violations

Healthcare Violations

Healthcare Violations

Healthcare Violations

Healthcare Violations

Healthcare Violations

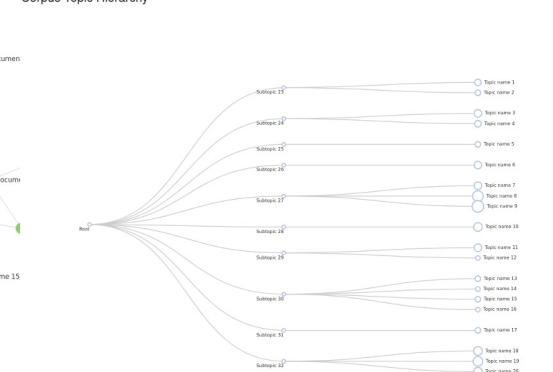
Healthcare Violations

Healthcare Violations

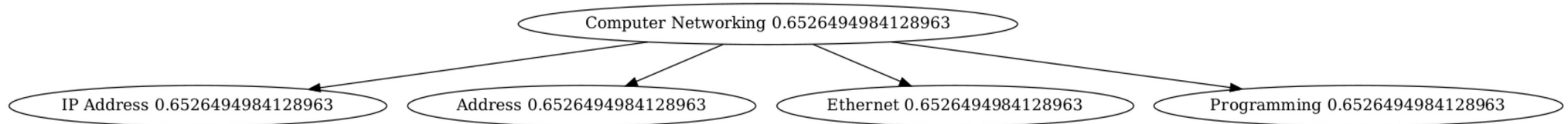
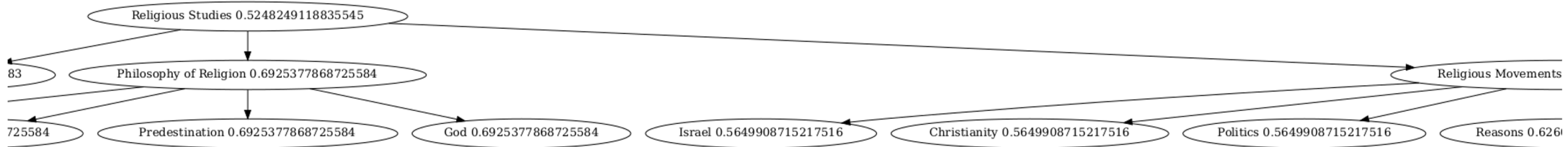
Corpus Document Topic Graph



Corpus Topic Hierarchy

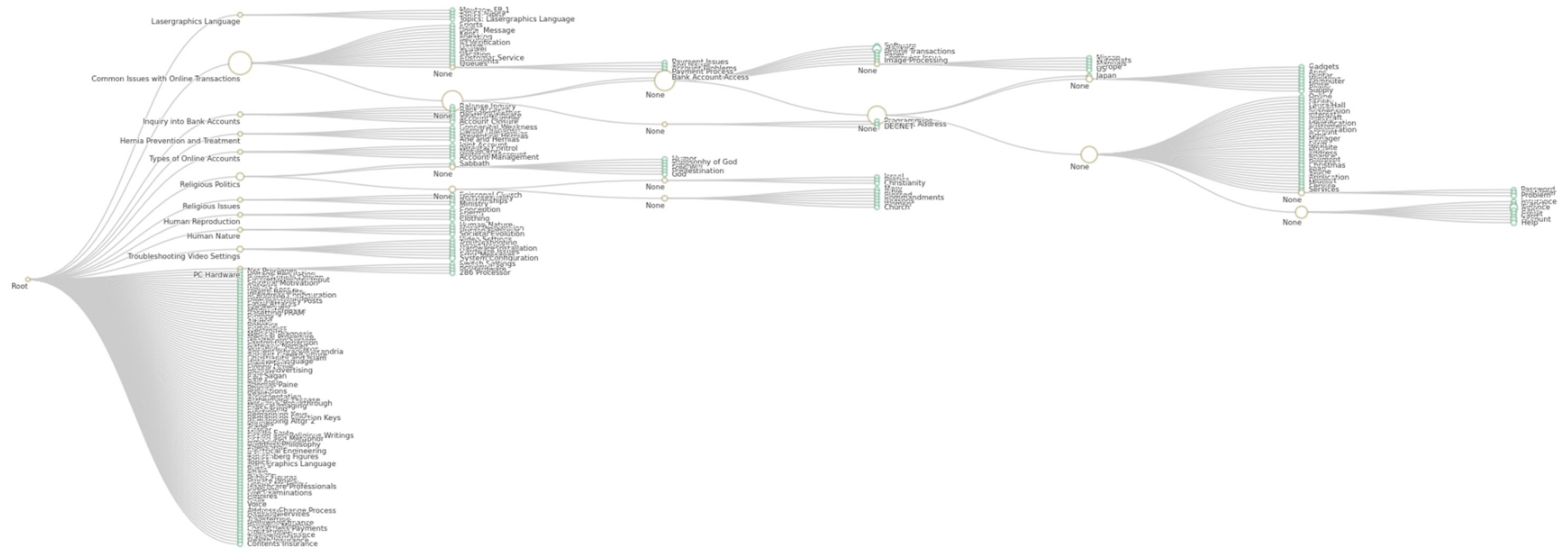


Example of Topic Hierarchy



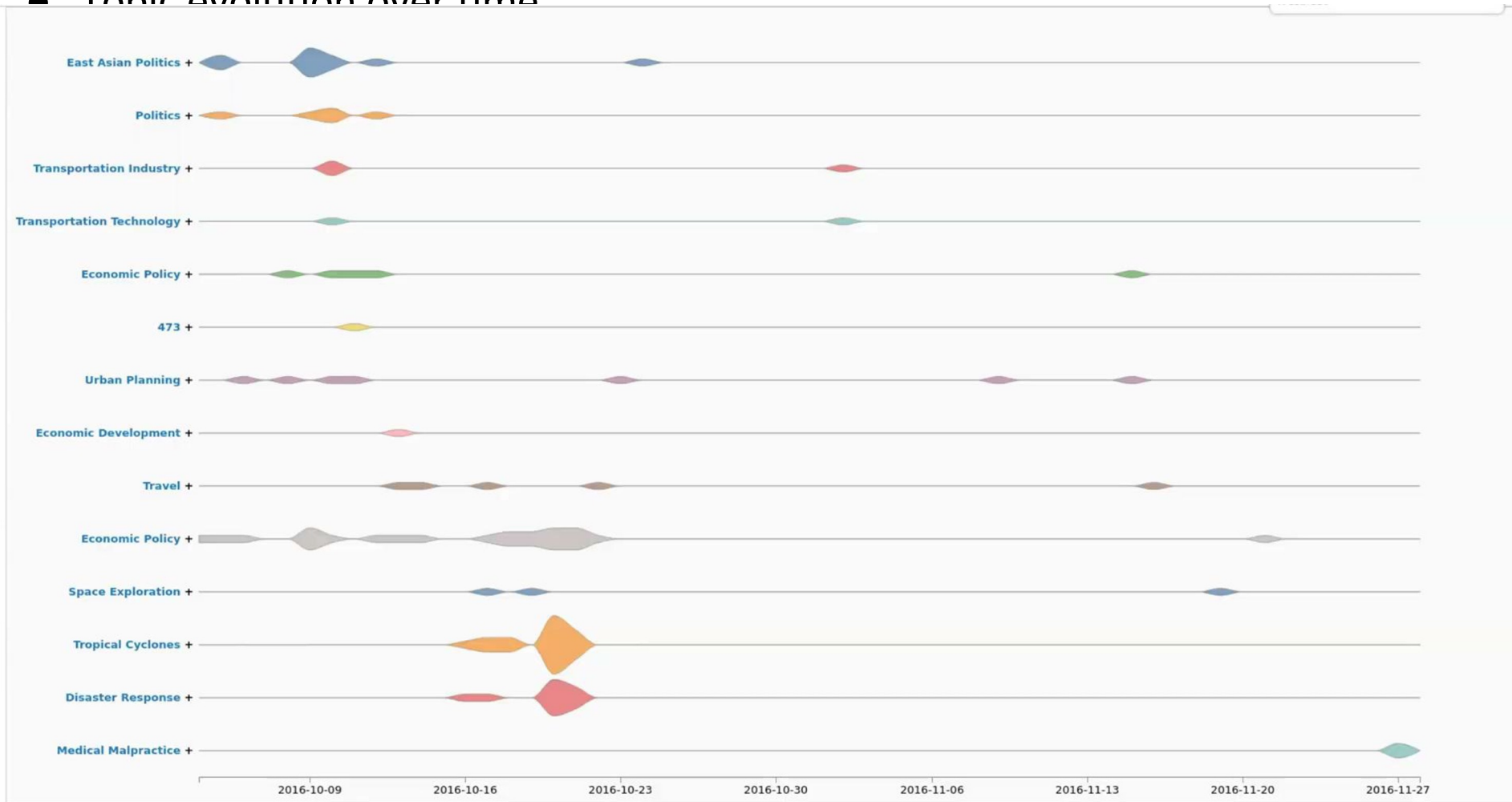
- Automatically generated topic hierarchy based on the corpus
- Allows filtering text for temporal analysis based on the topic granularity.

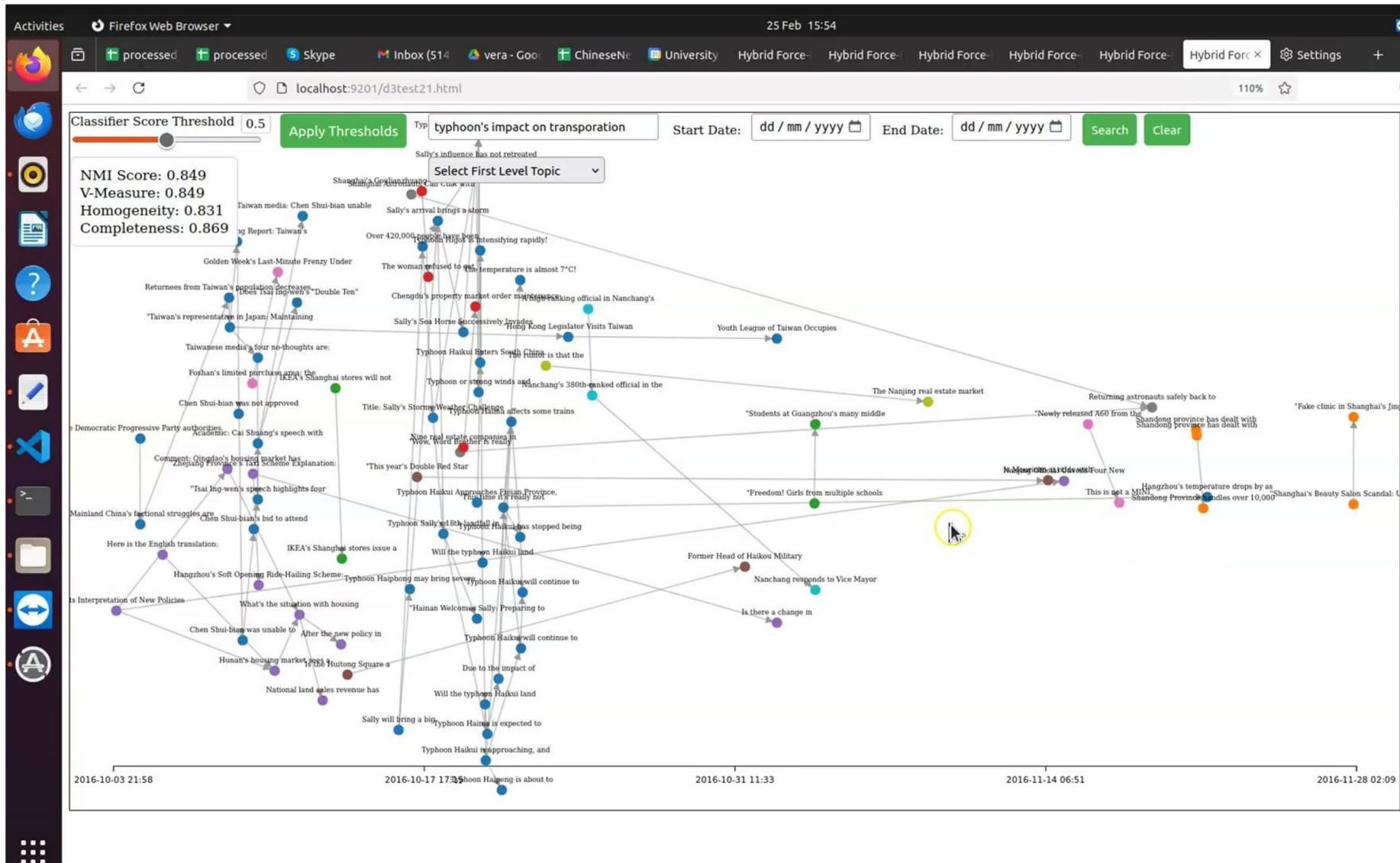
Corpus Topic Hierarchy



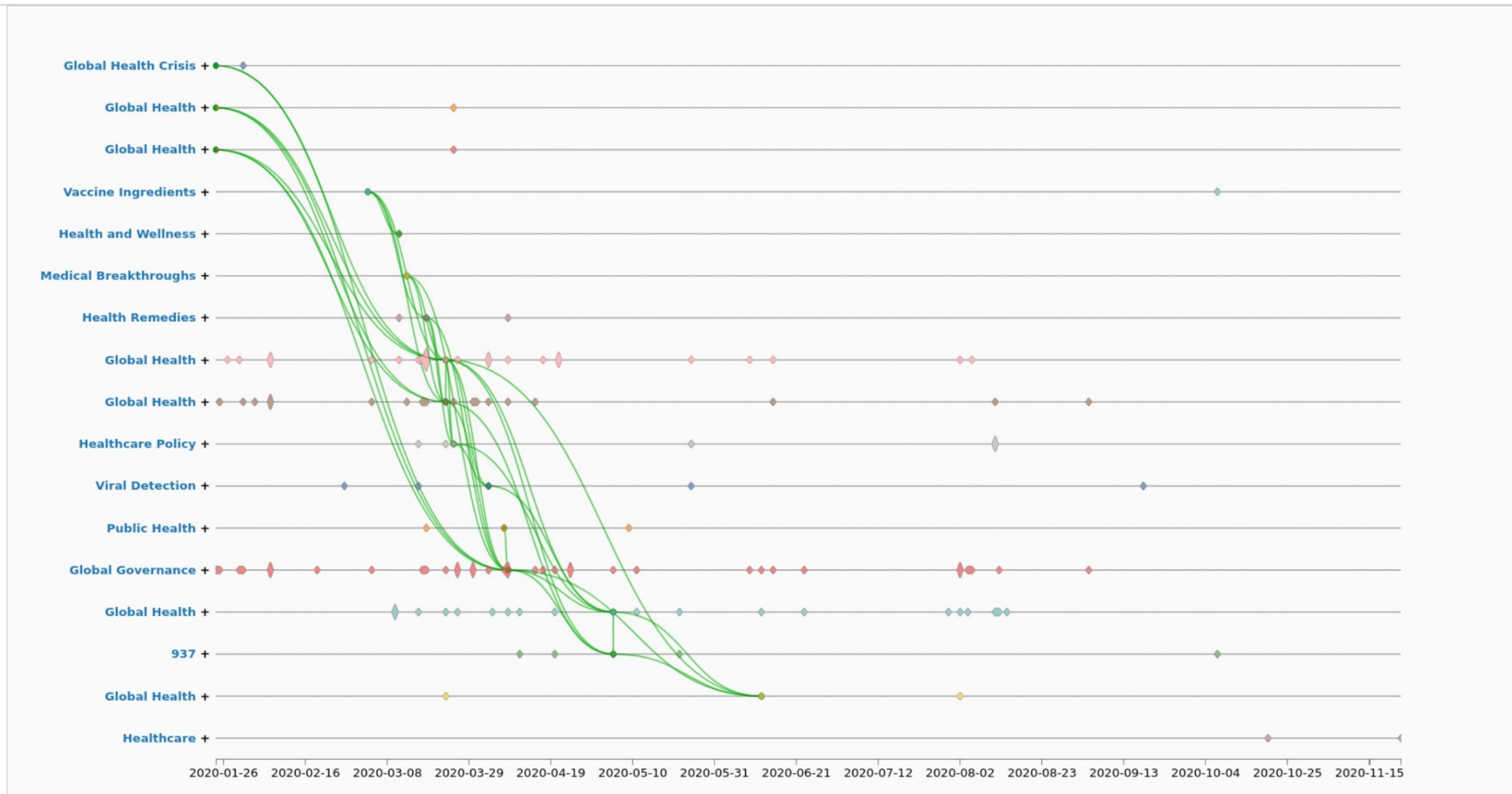
Topic Level Temporal Analysis

- Display topic volume over time
- Topic evolution over time





IFCN Covid Misinformation



Back

Covid contain HIV
insertions

Covid vaccine contains
HIV and SARS

us contains "HIV insertions."

The COVID-19 vaccine contains HIV an

"People's scientist" found that coronavirus is a bioweapon mixing SARS

Covid is bioweapon
mixing SARS

Vitamin C and lemon water prevent coronavirus.

Vitamin C can cure COVID-19.

2020-02-02 21:00

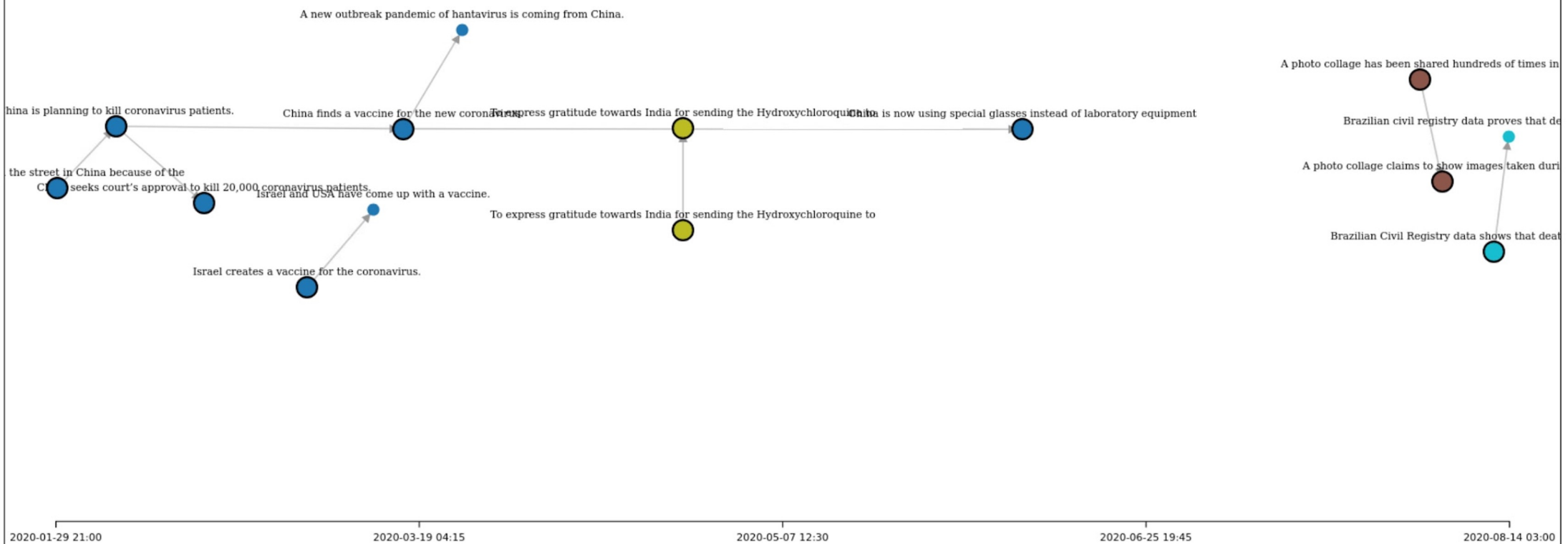
2020-04-04 17:15

2020-06-05 12:30

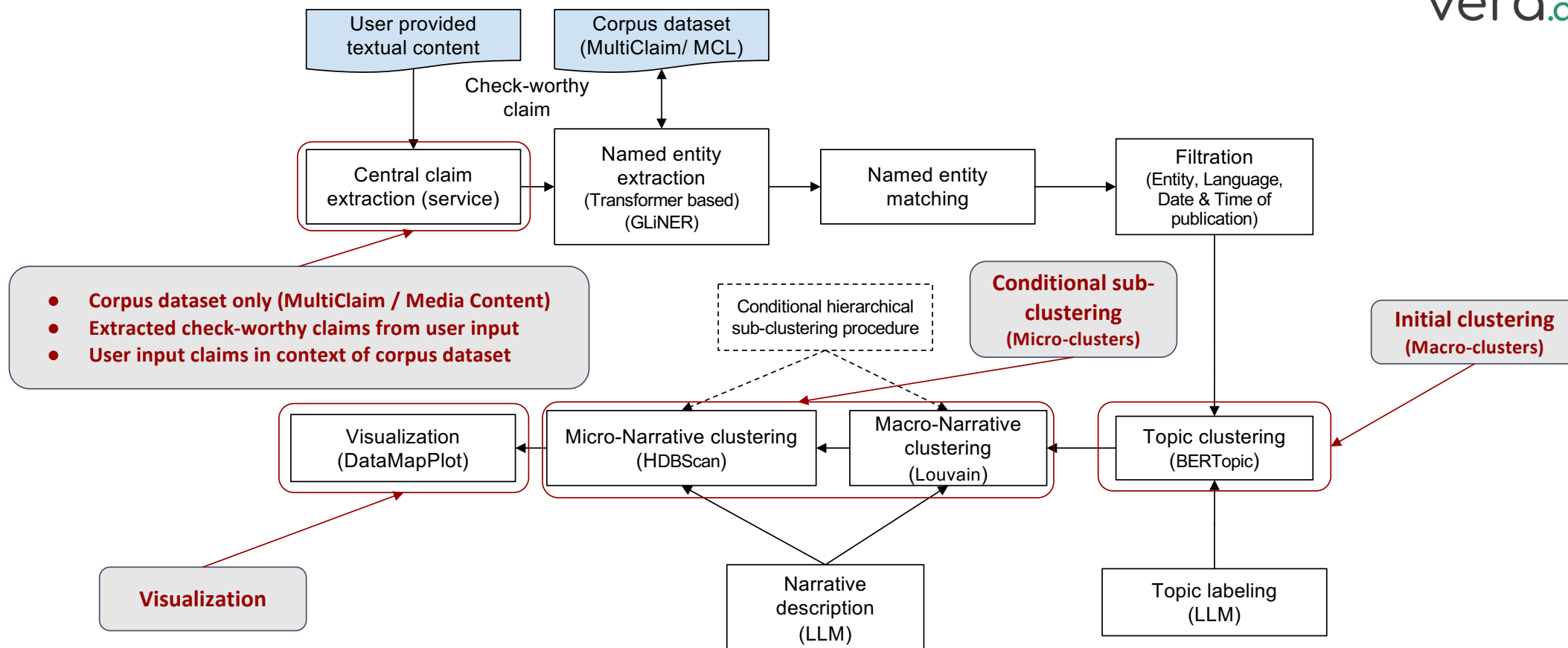
2020-08-06 07:45

2020-10-07 03:00

Back



KInIT UI Demo



Narrative detection pipeline diagram.

KInIT UI Demo



B B C

NEWS

Attack on US military base 'nothing to do with Qatar', Iran says

Iran launched missiles at a US military base in Qatar on Monday, in what it said was retaliation for American strikes against its nuclear sites over the weekend.

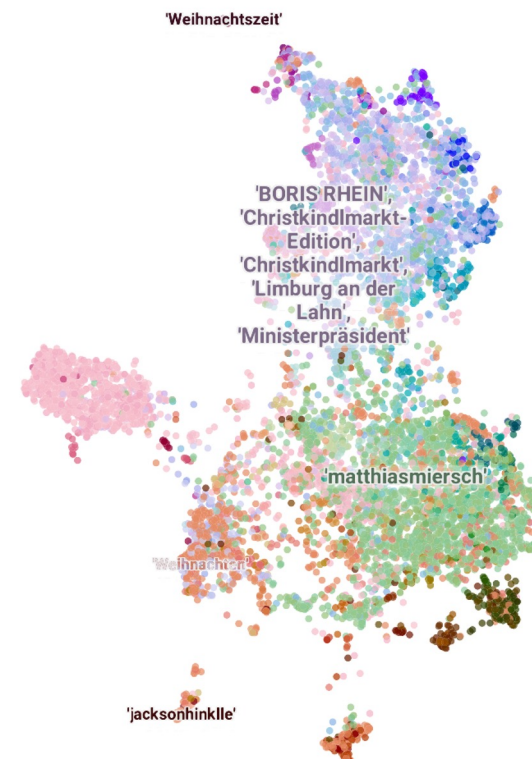
Witnesses reported hearing loud bangs in the sky above the capital, Doha, while videos showed bright flashes in the sky as air defence systems attempted to intercept missiles.

Donald Trump described the attack as "very weak" and "expected", and suggested peace in the region could proceed.

On Tuesday, the US president announced a ceasefire between Israel and Iran had come into effect.

Here is what we know.

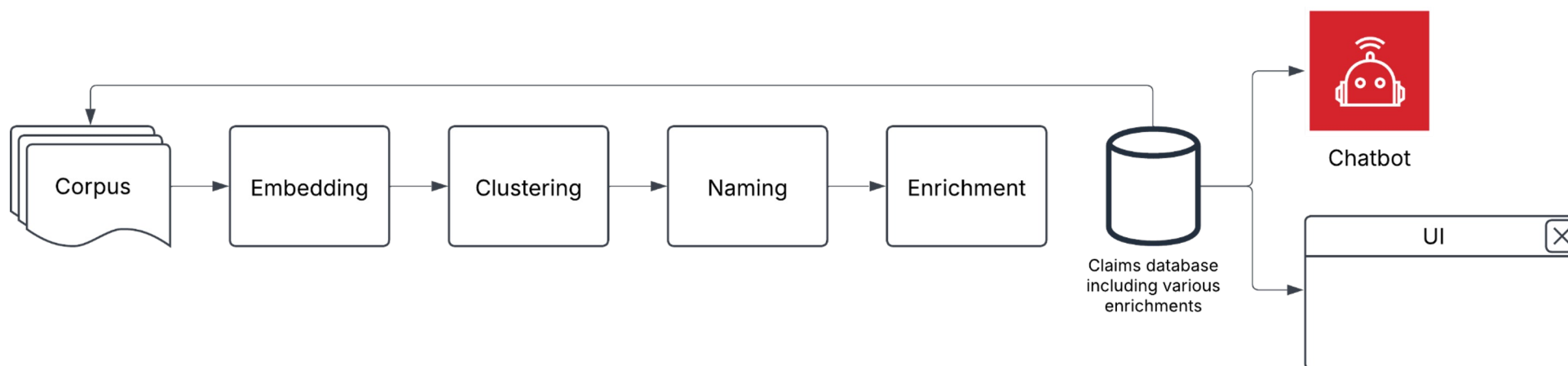
User input



Corpus dataset
(Media Content Library)

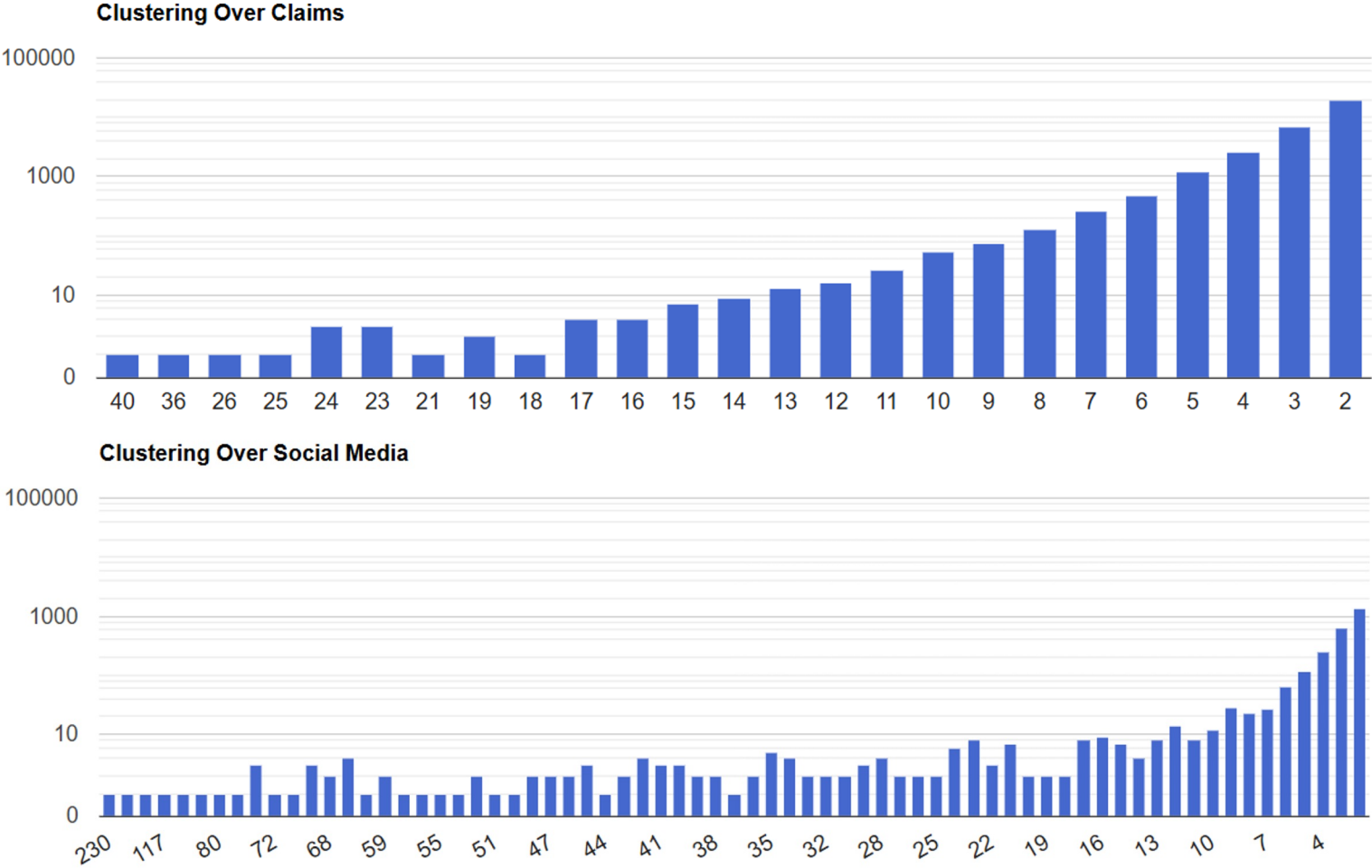
Page

ONTO UI Demo: Introduction



- Embedding: paraphrase-mpnet-base-v2
- Clustering: GPU-adapted stochastic HDBSCAN (cuml)
- Naming: Small Language Model (phi-4-mini-instruct)
- Enrichment: Multilingual Entity Linking and Event Detection
- Enrichment with inference: Time spans

ONTO UI Demo



Onto UI Demo: Cluster Search



Cluster search:

- Multilingual
- Facets
- Ordering by
 - Relevancy
 - Size
 - Recency
- Example:
 - Vaccine-related clusters

Search...

Search Result For:

VACCINE

About: 153 Clusters Order By: Relevance Cluster size Date

Search results available in 10 languages. To narrow down results, use the Language filter.

Result list Visualization

MISINFORMATION ABOUT GRAPHENE OXIDE IN COVID-19 VACCINES 2021-07-08 → 2023-03-23 Cluster details

Size: 10 en, de

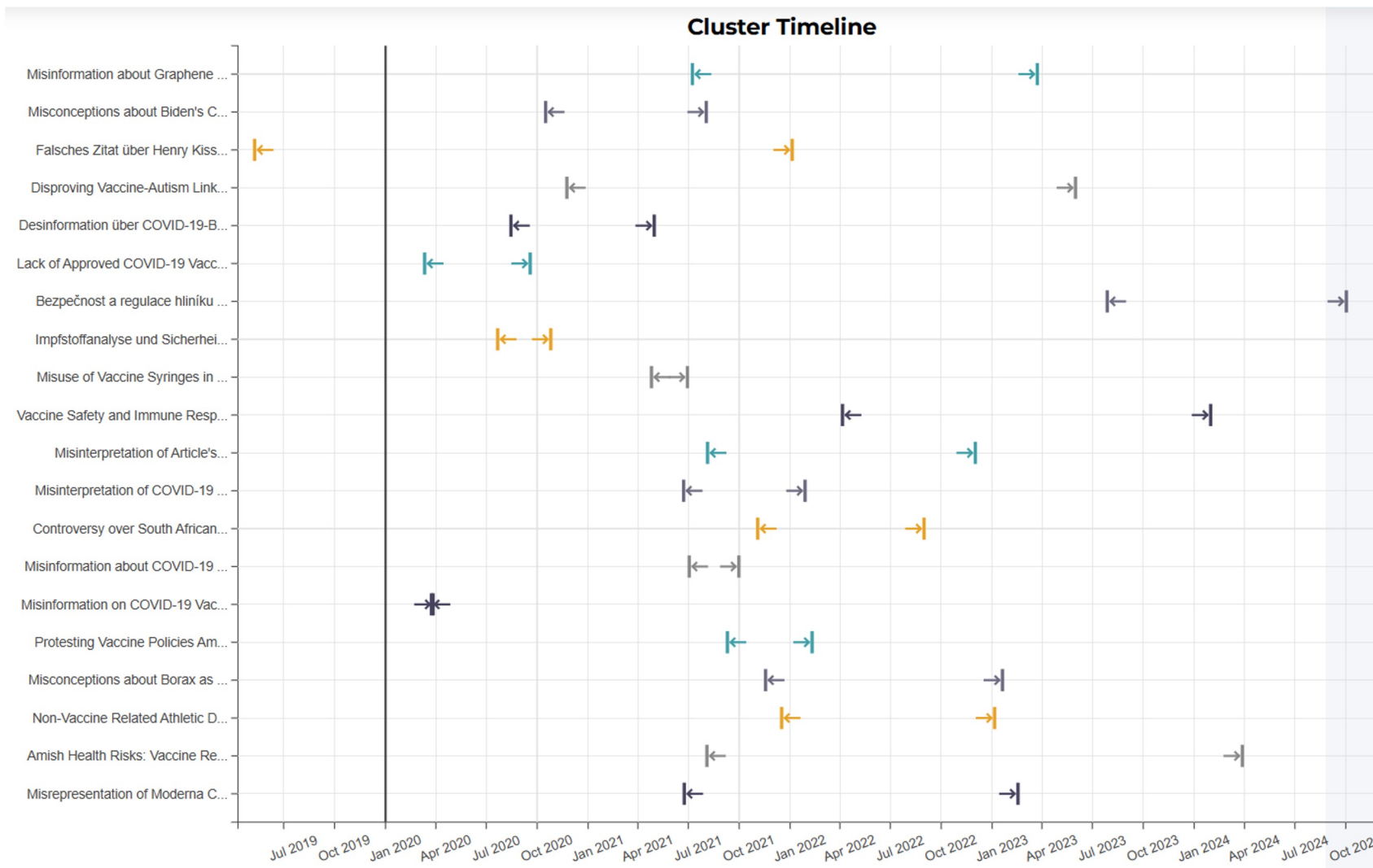
SOCIÁLNÍ DEZINFORMACIJA O COVID-19 VAKCÍNĀM NA FACEBOOKU 2020-11-25 → 2023-08-26 Cluster details

Size: 8 lv, cs

MISCONCEPTIONS ABOUT BIDEN'S COVID-19 POLICIES AND QUARANTINE CAMPS 2020-10-16 → 2021-08-02

Page

Onto UI Demo: Cluster Timelines



Onto UI Demo: Single Cluster View



Misinformation about Graphene Oxide in COVID-19 Vaccines

Size: **10**

Languages **en, de**

Start date: **2021-07-08**

End date: **2023-03-23**

Key concepts: **VACCINE** **MESSENGER RNA** **MODERNA** **SPAIN** **GERMANY** **ASTRAZENECA** **VACCINE HESITANCY** **COVID** **PFIZER** **EUROPEAN MEDICINES AGENCY** **GRAPHENOXID** **GRAPHENE**
MARBURG MARBURGVIRUS **OXIDE** **UNIVERSITY OF ALMERÍA** **BIONTECH** **BARBADOS** **COVID-19** **GRAPHITE OXIDE** **LEAD** **SPECTROSCOPY** **ANDRÉ CAMPRA** **FERROFLUID**

CLAIM

Pfizer Documents Do NOT Prove COVID Vaccines Contain Graphene Oxide

Document details

Leadstories

2023-03-23

CLAIM

Ein altes Video von 2021 kursiert erneut. Darin behauptet ein Mann, der mRNA-Impfstoff gegen Covid-19 von Biontech/Pfizer würde „giftiges“ Graphenoxid enthalten und verweist dazu auf ein „internes“ Do ... Show more

2023-01-17

Page

Onto UI Demo: Chatbot Integration



Here are the five biggest narrative clusters that mention the European Commission:

1. **Common Misinterpretation of EU Language Guidelines** - This cluster contains 8 claims.
2. **Misleading Apeel Product Claims** - This cluster contains 6 claims.
3. **Common theme: European Parliament's special committee on future democratic shield and false claims of EU annulling national elections** - This cluster contains 6 claims.
4. **Misinterpretation of Ursula von der Leyen's Handwashing Video** - This cluster contains 3 claims.
5. **Misleading Information on EU Car Ownership Legislation** - This cluster contains 3 claims.

These clusters represent recurring themes or narratives involving the European Commission.

Can you give me an overview of the major themes in disinformation claims that discuss elections in 2024?



Here are the major themes in disinformation claims related to the 2024 elections:

United States Elections 2024

1. **Trump's Endorsement of God Bless the USA Bible Company** - This cluster contains 1 claim.
2. **Voter Eligibility and Recount Issues** - This cluster contains 1 claim.

↑ Ask

Onto UI Demo: Chatbot Integration



Does the database contain any Meta posts that discuss elections?



The database contains several Meta posts that discuss elections. Here are some examples:

1. **Post 1:** Discusses the aftermath of a vote of confidence involving Olaf Scholz, leading to the potential dissolution of the Bundestag and setting the stage for elections on February 23, 2025. The post emphasizes the importance of stability and responsibility during this transitional period.
2. **Post 2:** Highlights the CDU Rheinland-Pfalz's preparation and motivation for the upcoming Bundestag election in 2025, expressing readiness to fight for values and beliefs that advance the country.
3. **Post 3:** Describes a historic day in the Bundestag where Olaf Scholz's decision to pose a vote of confidence paves the way for early elections. The post outlines the significant issues at stake in the election, such as economic modernization, social welfare, and international peace efforts.
4. **Post 4:** Discusses the political consequences following Olaf Scholz's loss of confidence, leading to early elections. It stresses the importance of the upcoming election in determining the country's future direction and the need for responsible political conduct during the campaign.
5. **Post 5:** Criticizes the current coalition government and calls for a political reset with the upcoming early elections. It highlights the challenges faced by the country and the need for a new government to address these issues effectively.

These posts reflect various perspectives and narratives surrounding the political climate and upcoming elections.



↑ Ask

Xyngy Song (USFD) Martin Hyben (KInIT) Andrey Tagarev (ONTOTEXT)



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