

The Economist

Europe

May 27th 2017 edition >

Stalemate

Ukraine and Russia are both trapped by the war in Donbas

The Minsk-2 peace agreement is a sham, but neither side can pull out

The New York Times

Putin Reclaims Crimea for Russia and Bitterly Denounces the West

f g t m s 1363

REUTERS®

World Business Legal Markets More

Europe

Russia accuses Ukraine of 'provocation' over ship incident in Kerch Strait - report

Reuters

The Observer World news

On the frontline of Europe's forgotten war in Ukraine

Four years after Russia backed the cause of separatist rebels, the death toll stands at 10,000. As the west moves on, millions feel abandoned to their fate

The **conflict between Russia and Ukraine** has been going on **since 2014**.



Can we use **BIG DATA MINING**
to improve our understanding?

Cyberwarfare: **Using Big Data Mining Methods** on Online News Sources **to Understand** **Concurrent Events with the** **Russo-Ukrainian War** for 2013-2022

Gaspar, Jayme, Nepomuceno, Paderes

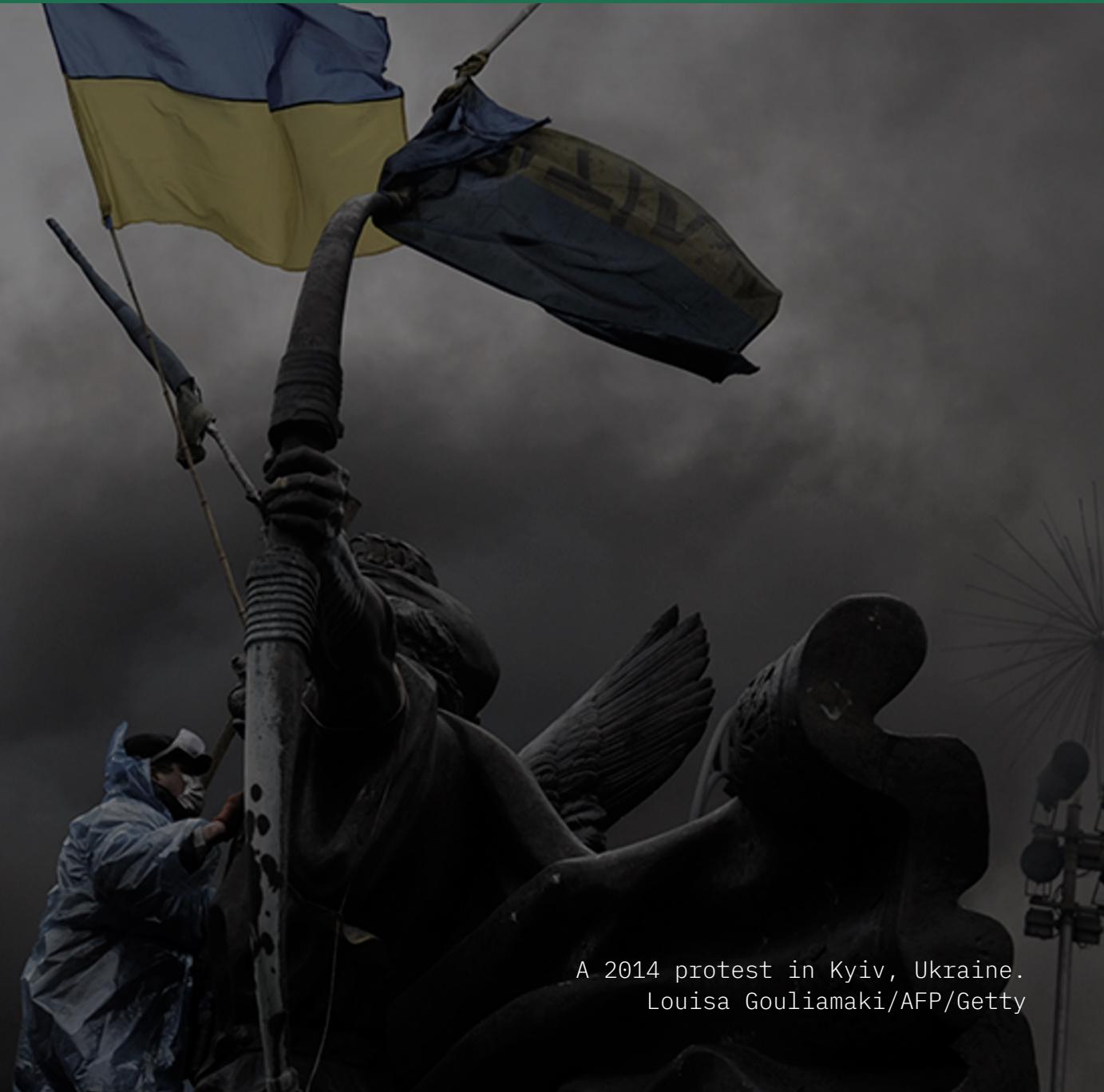
Big Data & Cloud Computing | MSDS 2022

Asian Institute of Management

Identify trends in
global sentiment

Extract frequently
occurring
geopolitical events

Contextualize the
present



A 2014 protest in Kyiv, Ukraine.
Louisa Gouliamaki/AFP/Getty

250GB

dataset size

3,355

days covered

621M

event records



Access data
in GCP
BigQuery

Copy files to
AWS S3

Process big data
in Parquet format using
AWS EMR instances in PySpark

Save
in AWS S3
& analyze

250GB

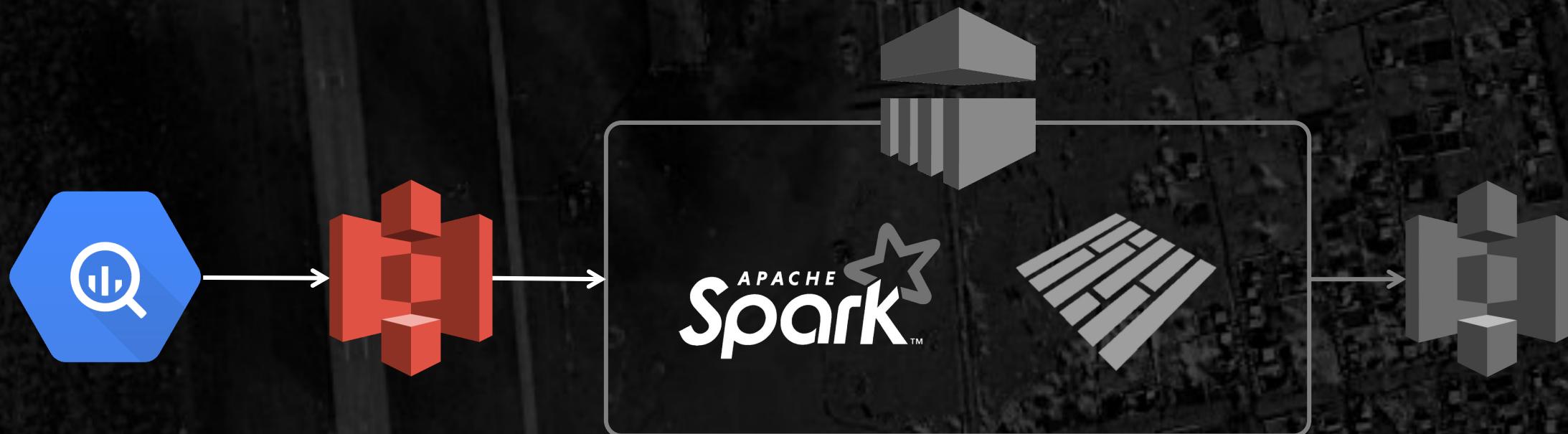
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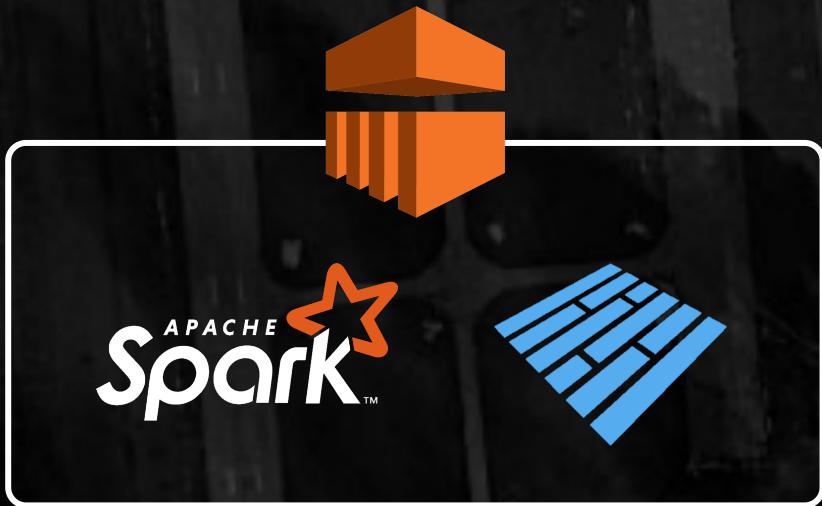


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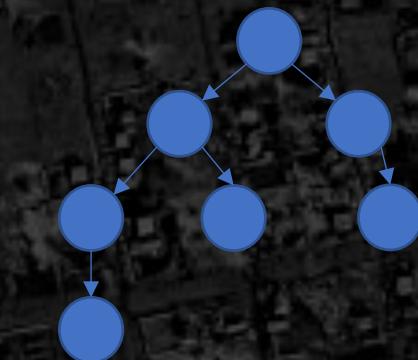
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Filter data by only including relevant events



Prepare database for FIM and partition by year



Run FP-Growth Algorithm to obtain association rules

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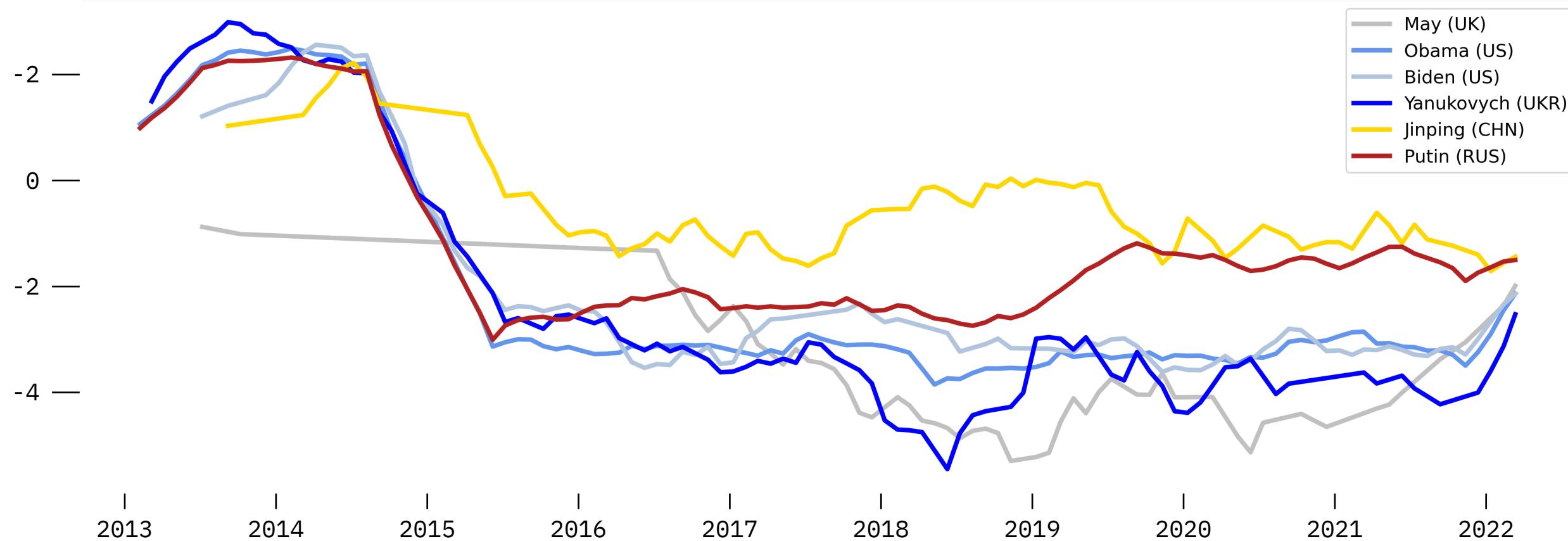
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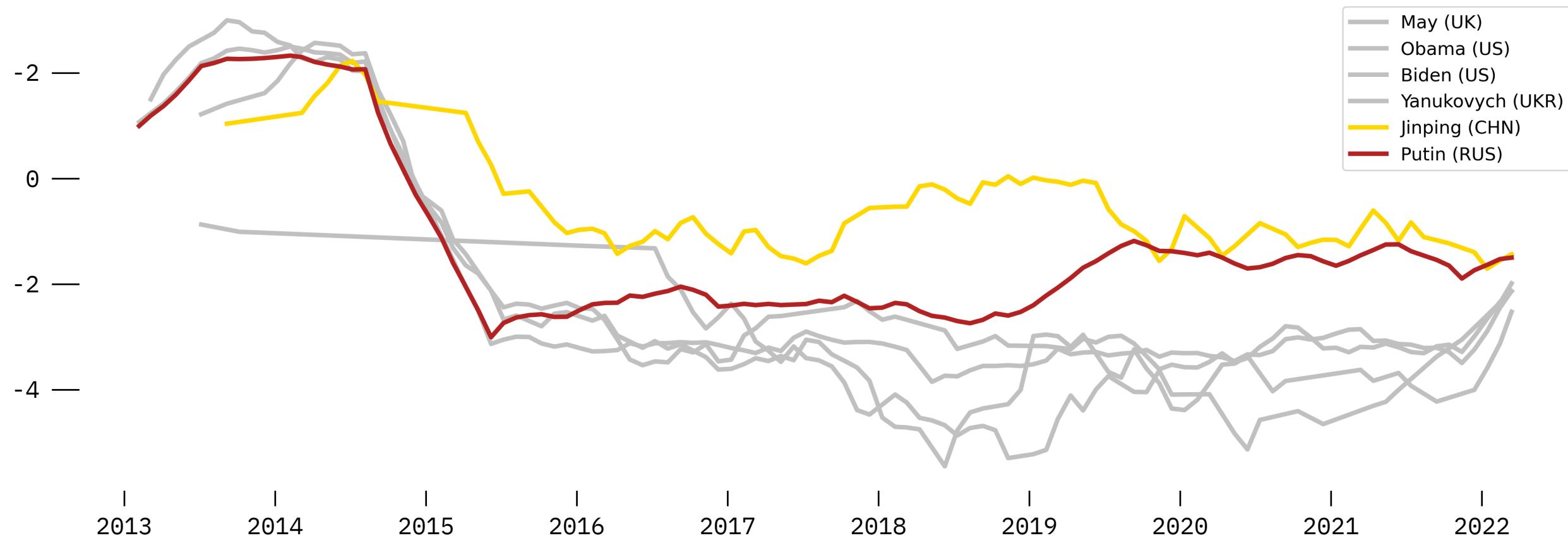
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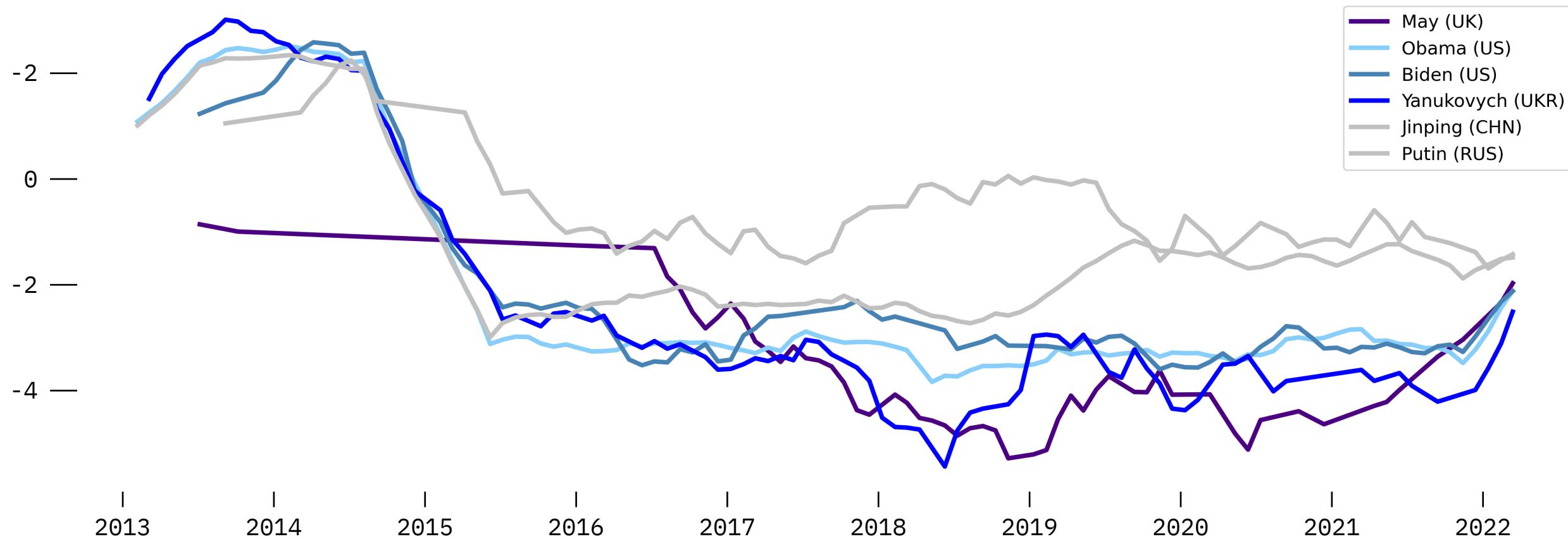
Average Tone of Documents on Significant Actors



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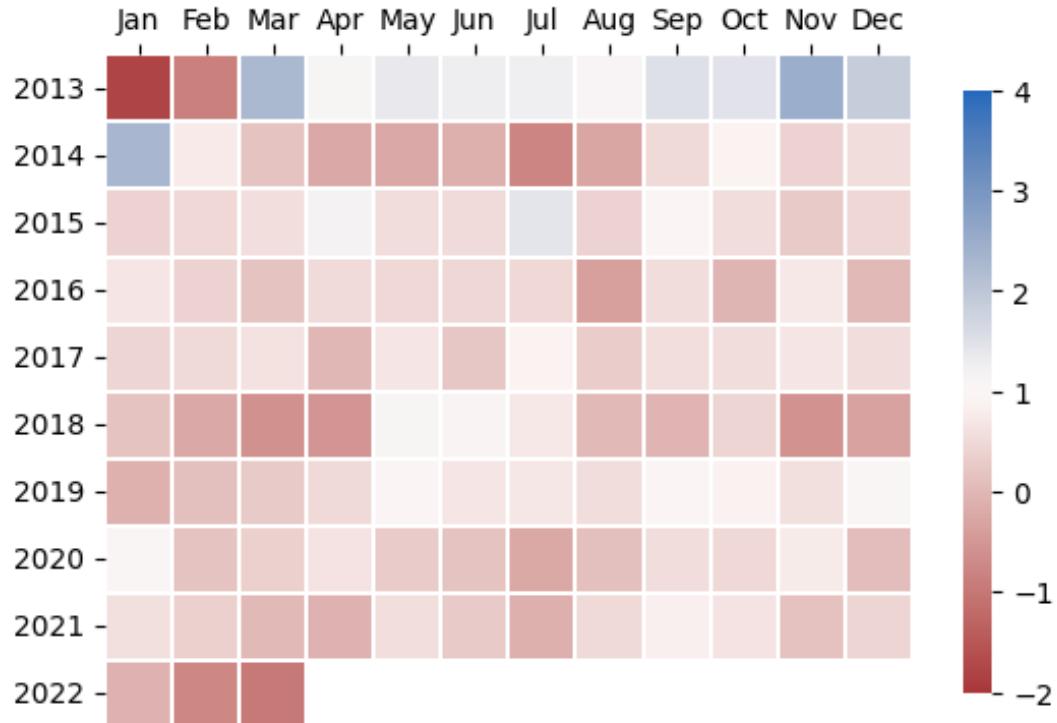


Number of Mentions about Events Related to Russia & Ukraine

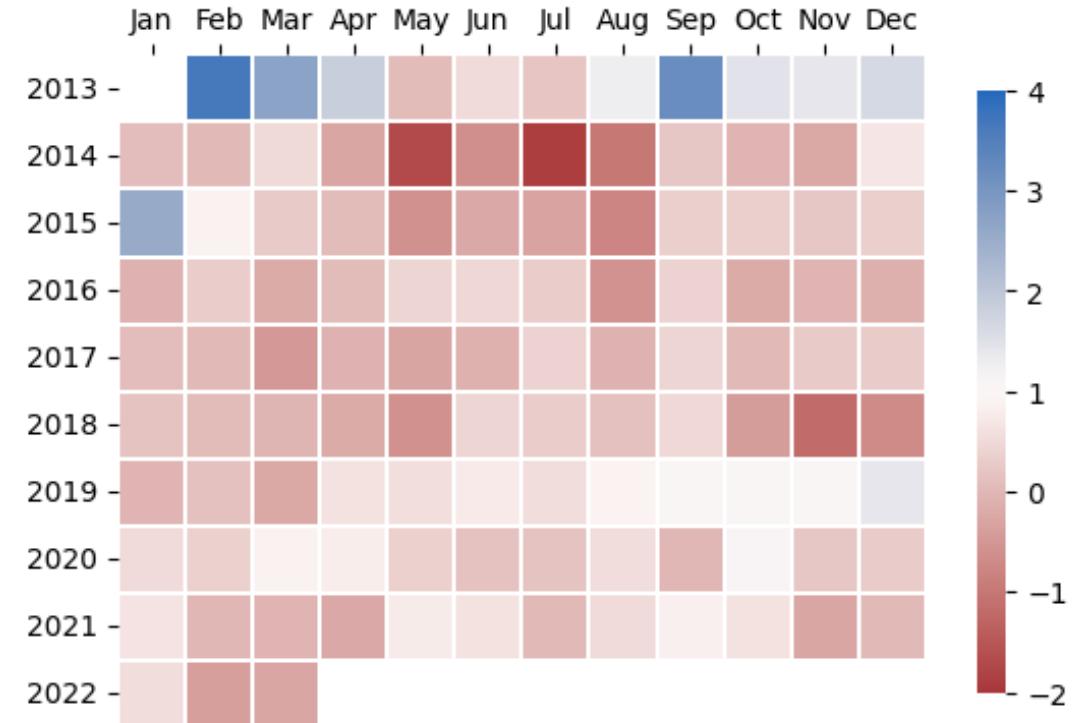


Goldstein Scale decreases at escalation events

Russia

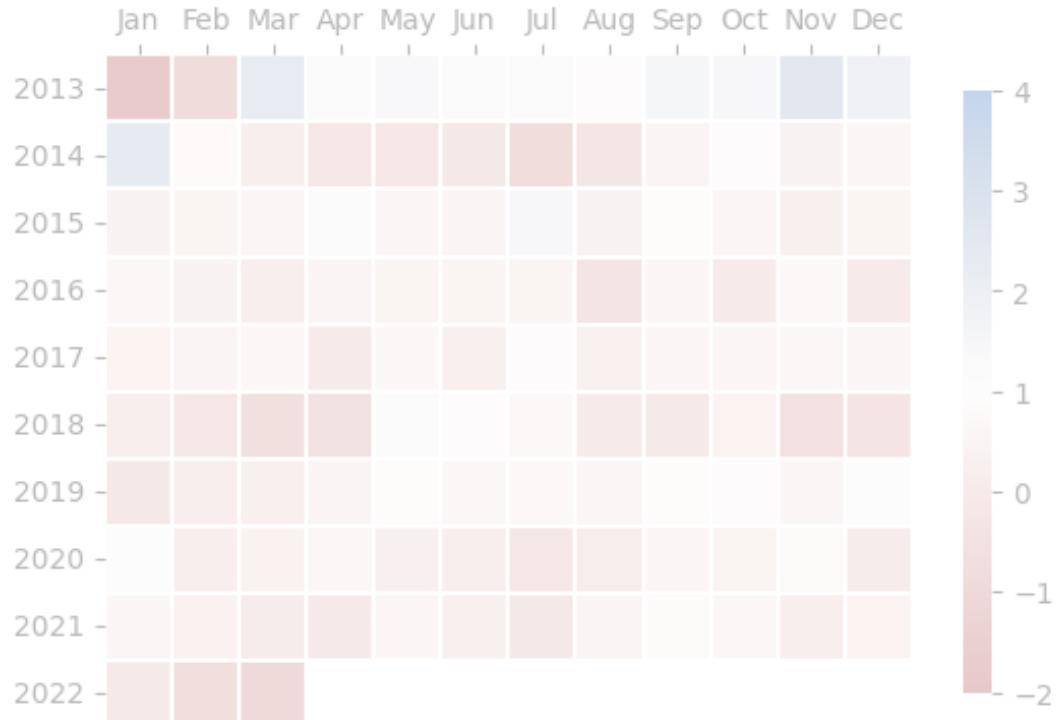


Ukraine

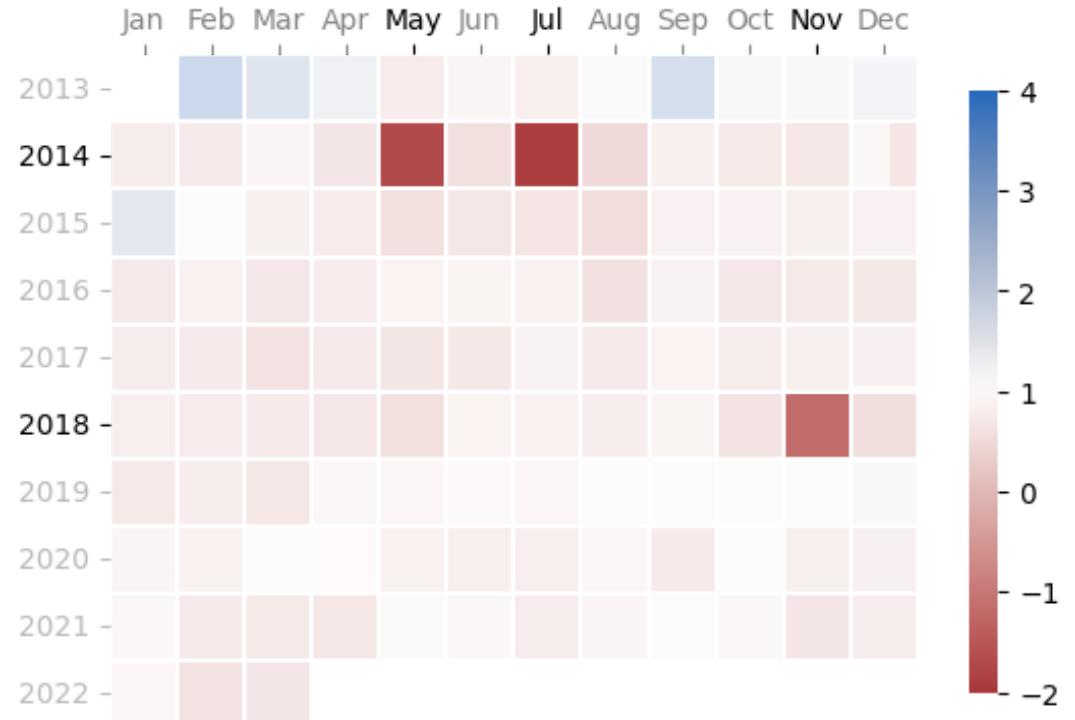


Goldstein Scale decreases at escalation events

Russia



Ukraine





Negotiations and consultations
occur between world superpowers

2013



2014



2015 - 2021



2022



Frequent item sets:
Antecedent Consequent



The War Starts

US sanctions RUS



2013

2014

2015 - 2021

2022



Frequent item sets:
Antecedent Consequent



China has formal agreements with RUS



RUS uses military force



EUR appeals, accuses/investigates RUS



US negotiates with, sanctions RUS



RUS appeals to US

2013



2014



2015-2021



2022



Frequent item sets:
Antecedent Consequent





Countries appeal to RUS

RUS uses military force

RUS is criticized/denounced

UKR is praised/endorsed

Countries sanction RUS

2013

2014

2015 - 2021

2022



Frequent item sets:
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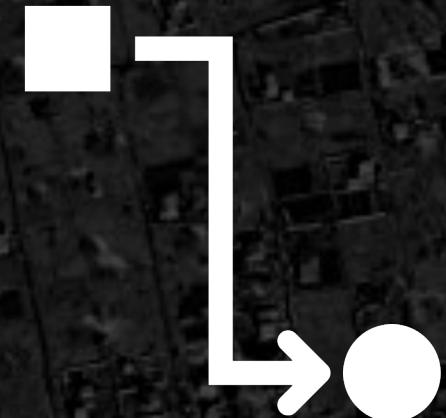
Key Takeaways



Absence of evidence is **not** evidence of absence



Event pattern mining provides **high-level insights** in a VUCA world



Sequence-aware event pattern mining can improve our results



People outside a Ukrainian building hit by a Russian shell in February 2022.
Daniel Leal/AFP/Getty Images

The **Russo-Ukrainian War has further escalated in early 2022**, with developments continuing to unfold every day.

Let's continue the conversation.

Join our meeting room after all the presentations at

<https://bit.ly/bdcc-5>



Manu
Gaspar



Jazel
Jayme



Colleen
Nepomuceno



Mavel
Paderes