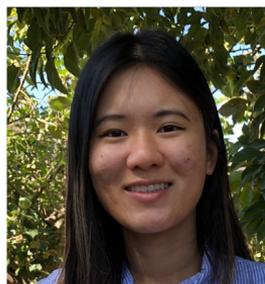# Twitter-COMMs:

Detecting Climate, COVID, and Military Multimodal Misinformation

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Motivation

These are the 400 jets used by #COP26Glasgow attendees to get to a conference on reducing emissions and fossil fuels. Clearly there will be fierce competition here for the Hypocrisy Awards

⚠ **Stay informed**
This media is presented out of context Find out more

The image was taken in New Orleans during the 2013 Super Bowl (Source, AP News Fact Check).

Protest in Berlin today against the CV Lockdown and tyranny

MSM says 20-25K protesters with most headlines says "thousands of people"...😂😂😂😂

According to police:
800,000 to 1,300,000,000 😱

This photo shows a street parade in Switzerland before the COVID-19 pandemic (Source, AP News Fact Check).

Ukrainian pilot who is 6-0 shoots down a Russian Su-35 with his Mig-29. He's been nicknamed the ghost of Kyiv, and is the first pilot since WW2 to achieve ace status!
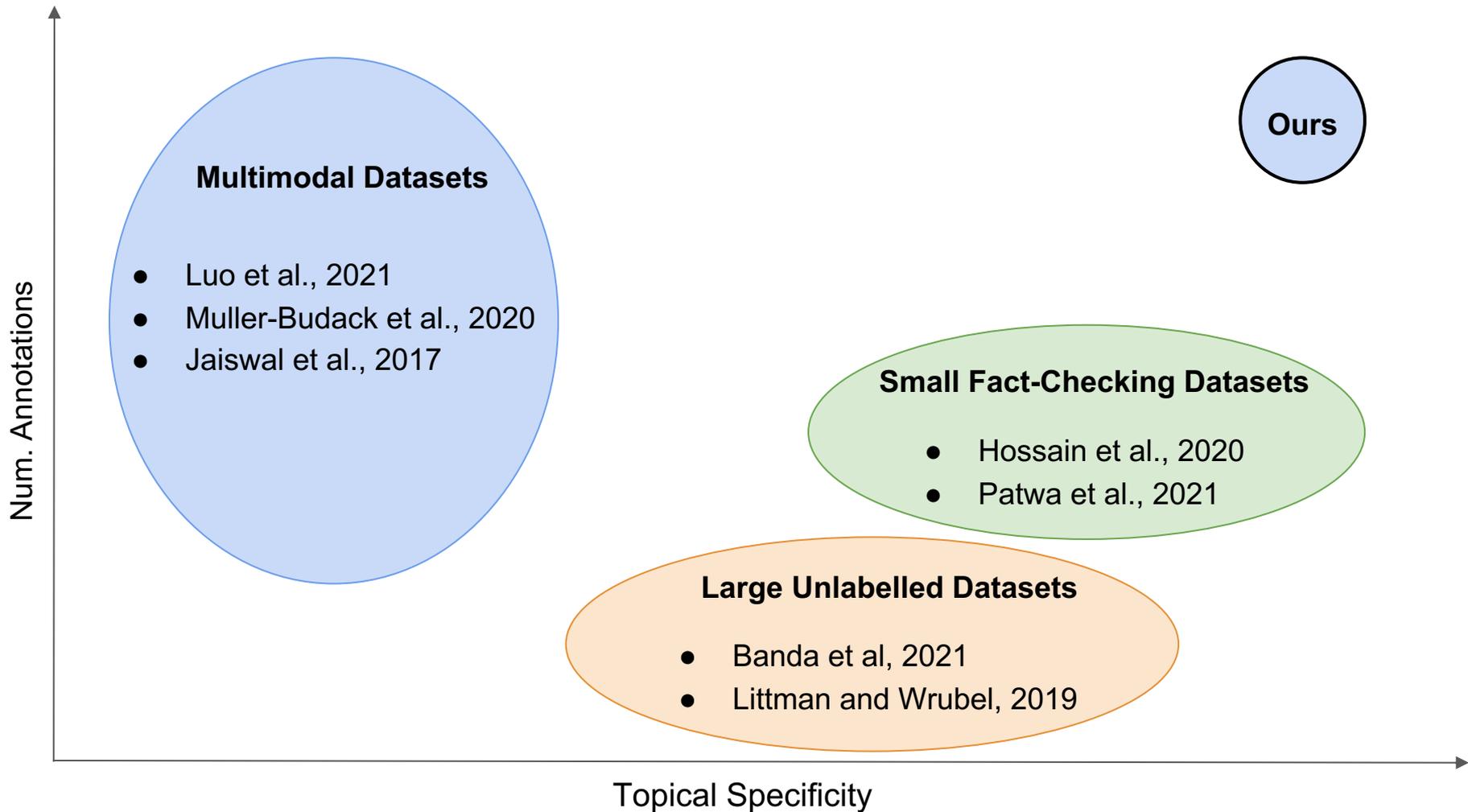
▶ 756.6K views   0:17 / 0:22

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This video footage taken from a video game (Source, Snopes Fact Check)

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Overview

1. We present **Twitter-COMMs**: a large-scale dataset of 884k *multimodal* tweets.
2. We select topics that are commonly targeted by misinformation:
   Climate Change, COVID-19, and Military.
1. We train on this dataset to detect *out-of-context social media images*.

Num. Annotations

Topical Specificity

Ours

Multimodal Datasets

- Luo et al., 2021
- Muller-Budack et al., 2020
- Jaiswal et al., 2017

Small Fact-Checking Datasets

- Hossain et al., 2020
- Patwa et al., 2021

Large Unlabelled Datasets

- Banda et al, 2021
- Littman and Wrubel, 2019

Dataset Collection

Key ingredients for data collection
- We collected using the Twitter API
- To maintain topical relevance we used keywords and news organizations
- For military vehicles we curated a dataset of vehicle and aircraft names and images, and trained an image classifier to filter to only images of military vehicles/aircraft

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Dataset Collection

Did you miss the @NPA2014_2020 #SMARTrenew #EUGreenWeek event The Role of #Geothermal #Energy in the Net Zero Transition? Catch up with the session recording ➡️https://youtube.com/watch?v=X4pSMN-Uh4w #climateaction #climatechange #cleanenergy #energytransition #renewables #renewableenergy
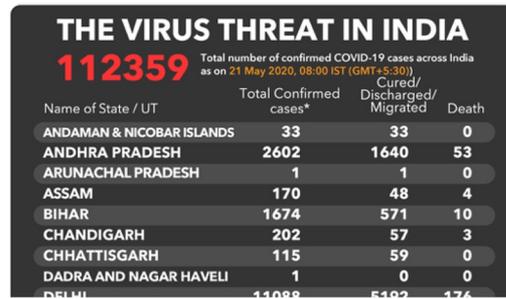

Leopard-2A5s of the 2nd Battalion, 1st Warsaw Armoured Brigade of the Polish Army during the evaluation training. #PolishArmy #Leopard2

Second-biggest single-day spike takes #Covid19 cases in India to over 1.1 lakh Read more: https://hindustantimes.com/india-news/second-biggest-single-day-spike-takes-covid-19-cases-in-india-to-over-1-1-lakh/story-eDqlpY7L9DVgxoUZyFc0aP.html
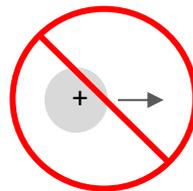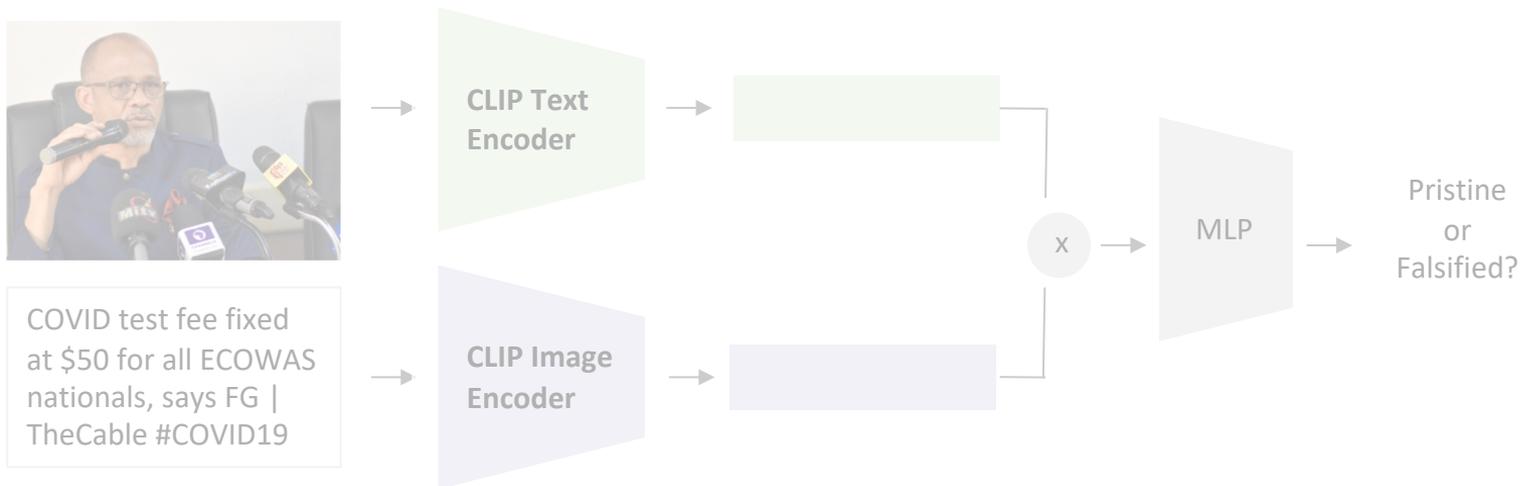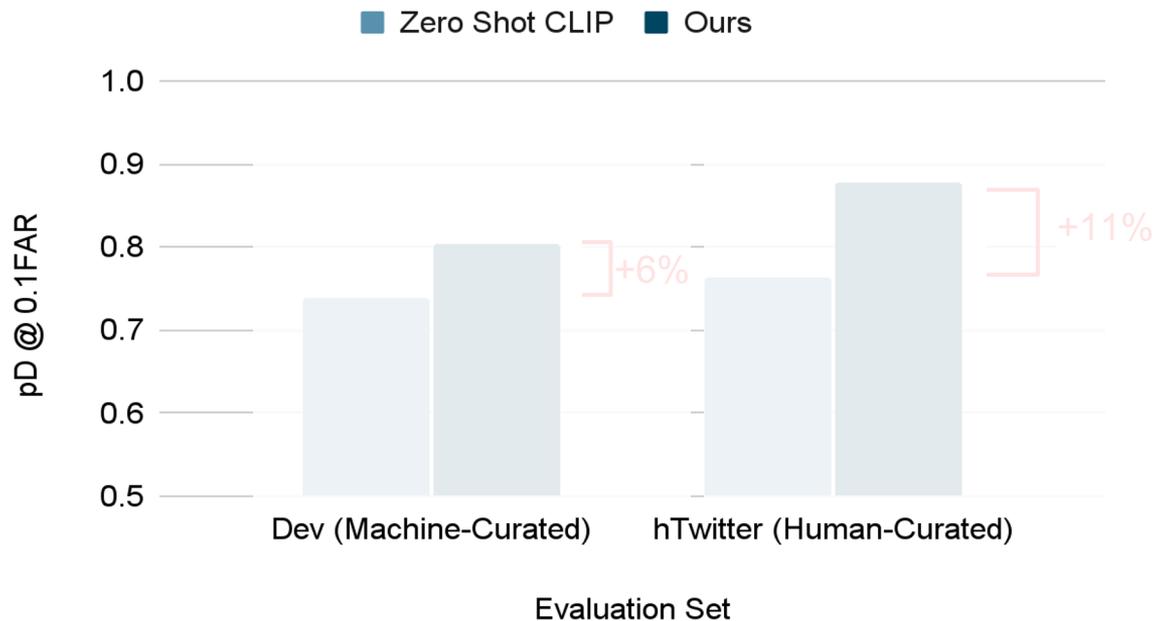

Climate Change   **Military Vehicles**   **COVID-19**

Dataset Statistics

	Pristine	Falsified - Random	Falsified - Hard
Climate Change	25%		
COVID-19	63%	25%	75%
Military	12%		
Total	2,468,592		

Approach

COVID test fee fixed at $50 for all ECOWAS nationals, says FG | TheCable #COVID19

CLIP Text Encoder

CLIP Image Encoder

x

MLP

Pristine or Falsified?

Radford et. al., Learning Transferable Visual Models from Natural Language Supervision, *Arxiv 2021.*
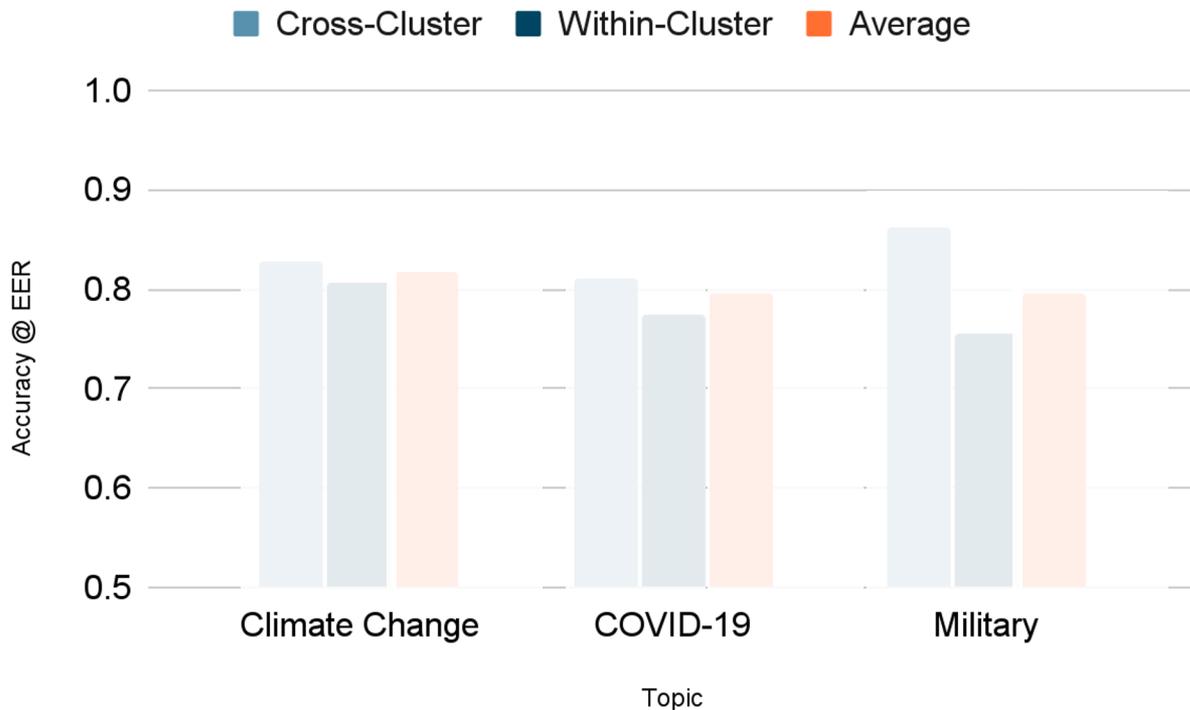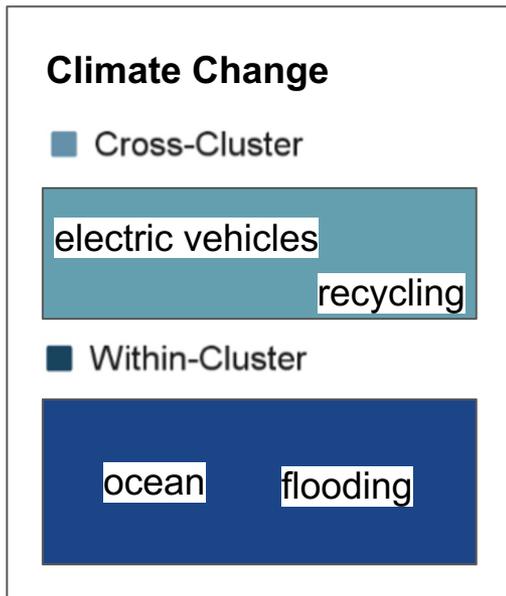
Experiments

Probability of Detection, High Precision Regime

Experiments

Dev Accuracy, Tweet Topic

Conclusion

- We present **Twitter-COMMs**, a multimodal dataset of tweets discussing Climate Change, COVID-19, and Military.
- We demonstrate its efficacy on an ***unseen evaluation set*** of out-of-context images where we only know the high-level topics.
- We analyze how specific topics and subtopics affect detection difficulty.

Thank you!

https://github.com/GiscardBiamby/Twitter-COMMs
https://arxiv.org/abs/2112.08594