Content, Context and Propagation Approaches for Fighting Disinformation

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Founded in 2000,
One of the leading research institutions in Greece

>1200 projects
1100 international collaborations
5 institutes
>1000 employees

In TOP-15 E.U.
research institutions in competitive research grants

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Information Technologies Institute

Information Technologies Institute

The **largest** among the five institutes of CERTH

>500 employees

> 175 EU projects

>100 national and industrial projects

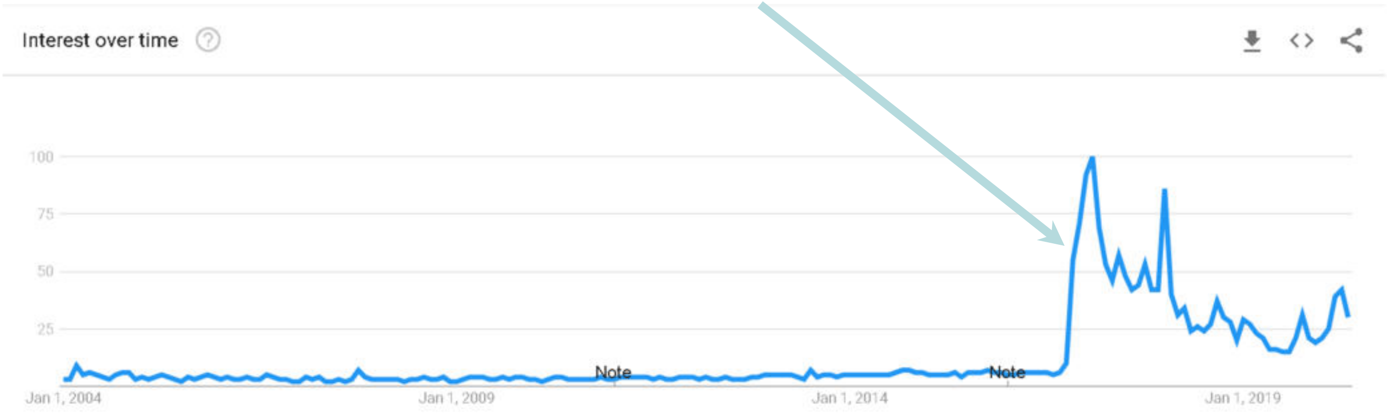
> 40M € via R&D activity -last 5 years

Infrastructure
HPC, Smart Home, Robots, Autonomous Vehicle, Drones, EEG, 3D Printing, VR

The Rise of Fake News

Volume for query “fake news” over time: A key milestone has been the US Elections in 2016, which marked the beginning of large-scale coordinated disinformation campaigns.

US Elections 2016

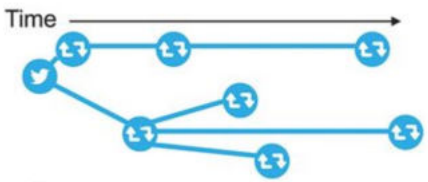


https://trends.google.com/trends/explore?date=all&geo=US&q=fake%20news

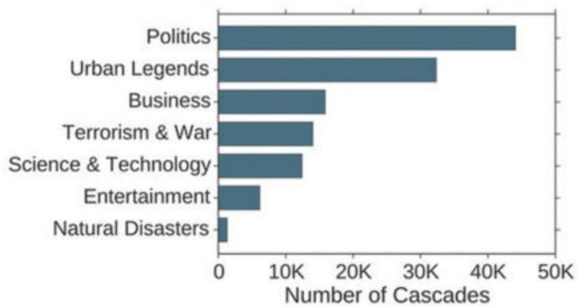

A challenge…
…as old as time
{disinformation}
{misinformation}
high cost in both cases

The Diffusion of Fake News

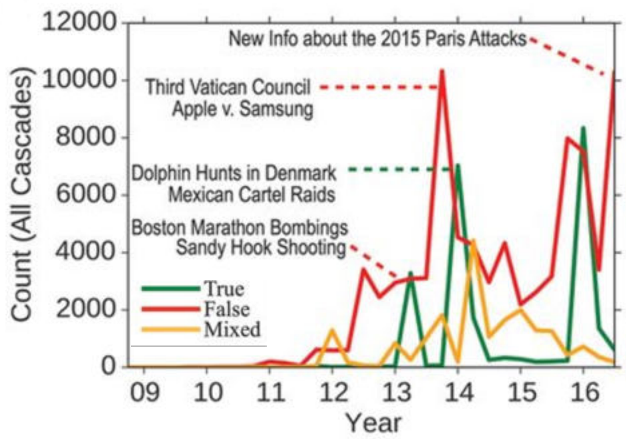
Example cascade



Topic frequency



Number of cascades



Misleading posts tend to spread faster and wider compared to accurate ones.

Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science*, *359*(6380), 1146-1151.

Visual disinformation is dangerous

- More persuasive than text
- Attracts more attention
- More tempting to share
- Can easily cross borders

Hameleers, M., Powell, T. E., Van Der Meer, T. G., & Bos, L. (2020). **A picture paints a thousand lies? The effects and mechanisms of multimodal disinformation and rebuttals disseminated via social media**. *Political Communication*, *37*(2), 281-301.

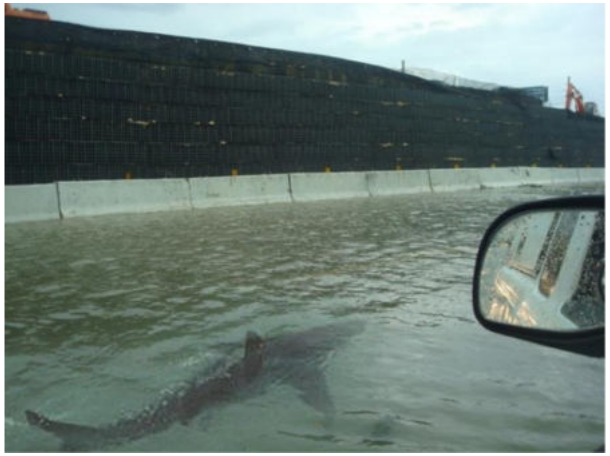
Dan, V., Paris, B., Donovan, J., Hameleers, M., Roozenbeek, J., van der Linden, S., & von Sikorski, C. (2021). **Visual mis-and disinformation, social media, and democracy**. *Journalism & Mass Communication Quarterly*, *98*(3), 641-664.

Thomson, T. J., Angus, D., Dootson, P., Hurcombe, E., & Smith, A. (2020). **Visual mis/disinformation in journalism and public communications: current verification practices, challenges, and future opportunities**. *Journalism Practice*, 1-25.

…seeing is believing

The Famous Shark

2005



https://www.snopes.com/photos/animals/puertorico.asp

Maury Page
@mopage19
Follow

A shark photographed on I-75 just outside of Naples, FL

This is insane. #HurricaneIrma

8:12 PM - Sep 10, 2017

1,506 5,538 12,545

Jason Michael
@Jeggit
Follow

Believe it or not, this is a shark on the freeway in Houston, Texas. #HurricaneHarvy

9:00 AM - Aug 28, 2017

7,168 88,805 149,387

SoaR Gilli ✈️ Logan
@Mcgillligan
Follow

A shark was pushed inland from #HurricaneMatthew

7:27 PM - Oct 7, 2016

22 263 506

Austin. ⚠️
@austinelement
Follow

Shark in road #sandy

2:53 AM - Oct 30, 2012

6 86 13

DeepFakes

- Content, generated by deep neural networks, that seems authentic to human eye
- Most common form: generation and manipulation of human face

Source: [Media Forensics and DeepFakes: an overview]

Source: https://www.youtube.com/watch?v=iHv6Q9ychnA

Source: https://en.wikipedia.org/wiki/Deepfake

DeepFakes Generation

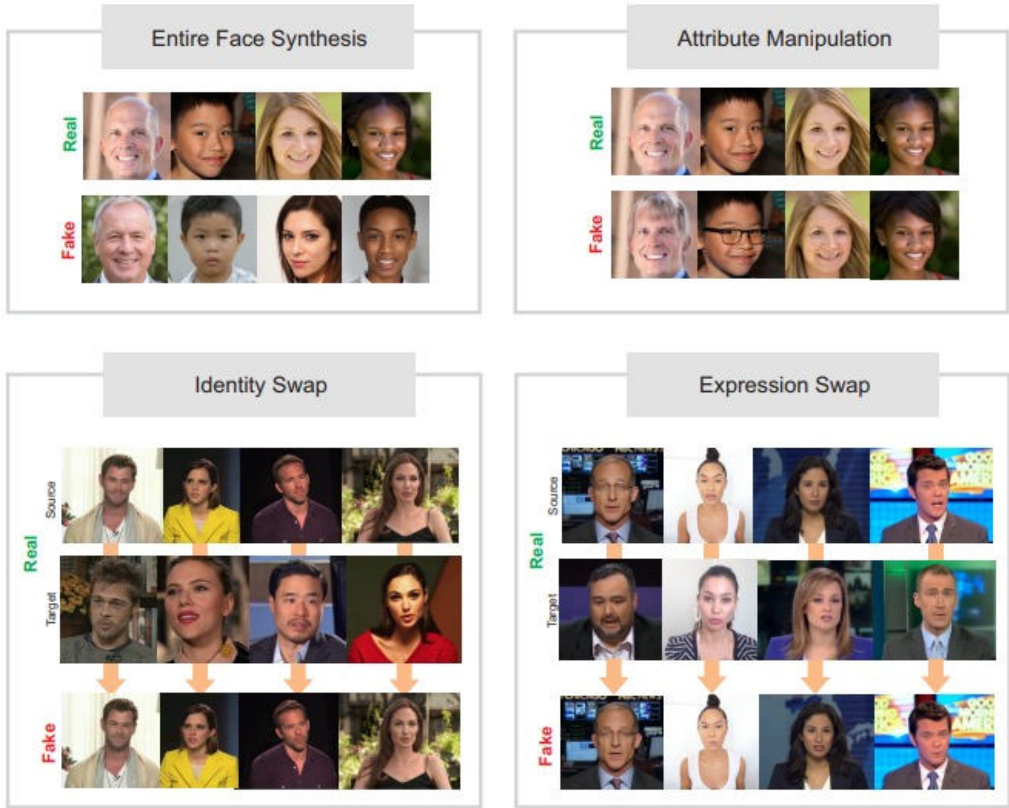
Four main types of face DeepFakes: a) *Entire face synthesis*, b) *Attribute manipulation*, c) *Identity swap*, d) *Expression swap*.

Lip syncing and *voice generation* are also common types in video and audio content.

Tolosana, R., et al. (2020). Deepfakes and beyond: A survey of face manipulation and fake detection. Information Fusion, 64, 131-148.
Verdoliva, L. (2020). Media forensics and deepfakes: an overview. IEEE Journal of Selected Topics in Signal Processing, 14(5), 910-932.
Mirsky, Y., & Lee, W. (2021). The creation and detection of deepfakes: A survey. ACM Computing Surveys (CSUR), 54(1), 1-41.

generation

editing



replacement

reenactment

Source: *DeepFakes and Beyond: A Survey of Face Manipulation and Fake Detection (Tolosana et al., 2021)*

A New Level of Realism

- Created by Chris Ume, a VFX specialist
- Not detected by any of the commercial detection services
- Not discernible by human inspection
- Potential for misleading
  but to date barriers are still high
- a lot of expertise, skill and time
- an impersonator who looks like the target
  (Miles Fisher)

https://www.theverge.com/2021/3/5/22314980/tom-cruise-deepfake-tiktok-videos-ai-impersonator-chris-ume-miles-fisher

Gaining popularity

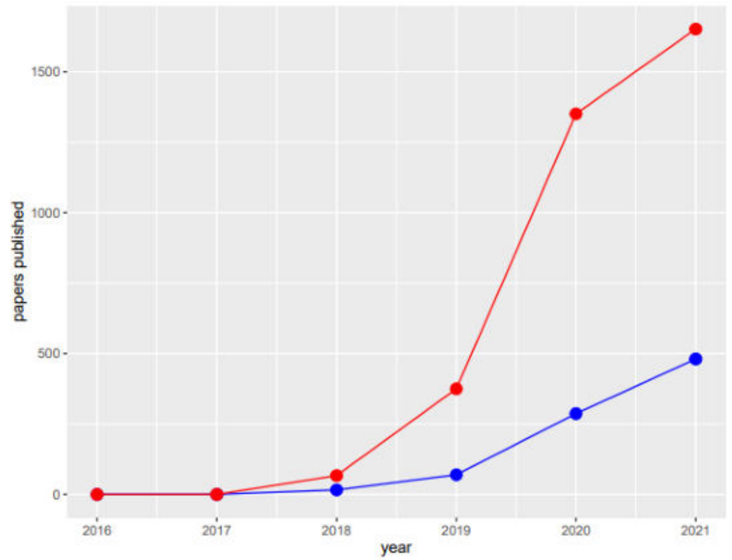


Figure 1: The red line illustrates the number of papers where the term "DeepFake" appears at least once in the text, while the blue line illustrates the term has to be in the title and the abstract. Data obtained from https://app.dimensions.ai.

Baxevanakis, S., et al. (2022). The MeVer DeepFake Detection Service: Lessons Learnt from Developing and Deploying in the Wild. Submitted to ICMR MAD 2022

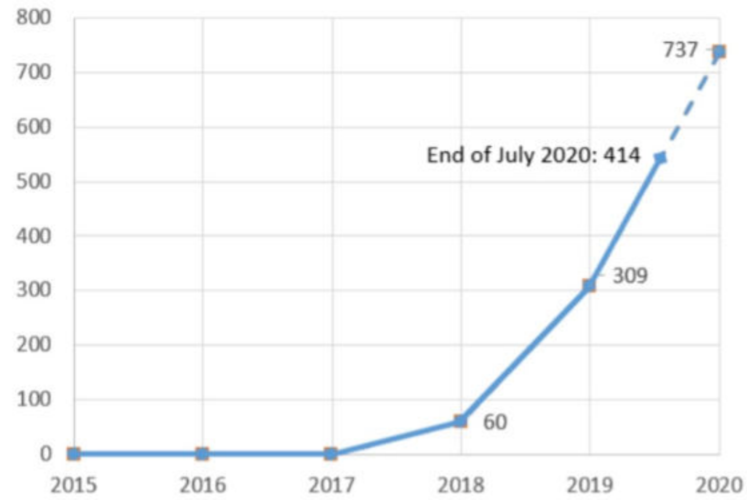


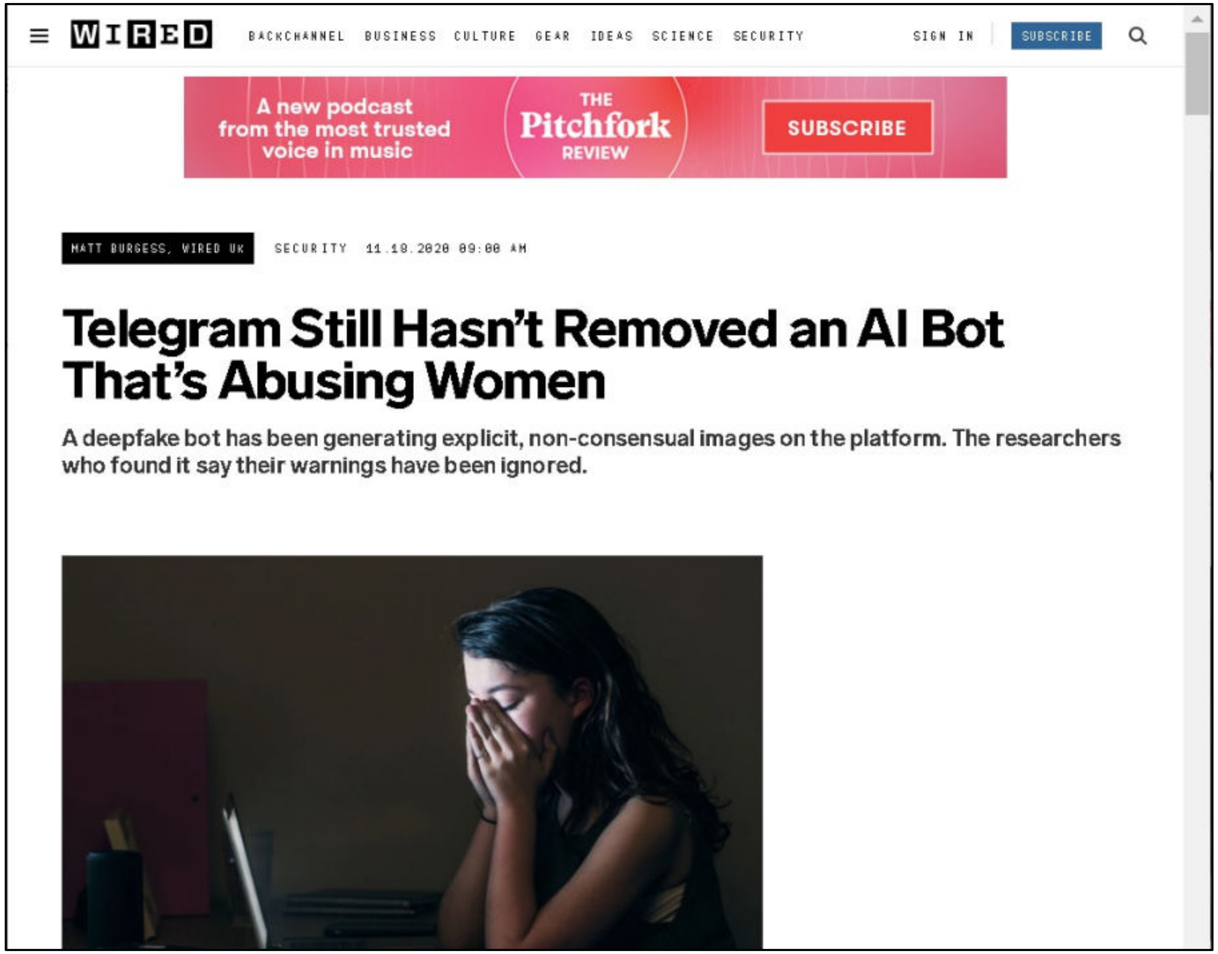
Fig. 1. Number of papers related to deepfakes in years from 2015 to 2020, obtained from https://app.dimensions.ai on 24 July 2020 with the search keyword "deepfake" applied to full text of scholarly papers. The number of such papers in 2018 and 2019 are 60 and 309, respectively. From the beginning of 2020 to near the end of July 2020, there are 414 papers about deepfakes and we linearly estimate that this number will be rising to more than 730 until the end of 2020.

Nguyen, T. T., et al. (2019). Deep learning for deepfakes creation and detection. *arXiv preprint arXiv:1909.11573, 1.*

Potential Risks and Harms

Psychological harm	Financial harm	Societal harm
• (S)extortion • Defamation • Intimidation • Bullying • Undermining trust	• Extortion • Identity theft • Fraud (e.g. insurance/payment) • Stock-price manipulation • Brand damage • Reputational damage	• News media manipulation • Damage to economic stability • Damage to the justice system • Damage to the scientific system • Erosion of trust • Damage to democracy • Manipulation of elections • Damage to international relations • Damage to national security Damage to Public Health

[Tackling deepfakes in European policy](), Panel for the Future of Science and Technology, Scientific Foresight Unit (STOA), July 2021



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A new podcast from the most trusted voice in music THE Pitchfork REVIEW SUBSCRIBE

MATT BURGESS, WIRED UK SECURITY 11.10.2020 09:00 AM

Telegram Still Hasn't Removed an AI Bot That's Abusing Women

A deepfake bot has been generating explicit, non-consensual images on the platform. The researchers who found it say their warnings have been ignored.

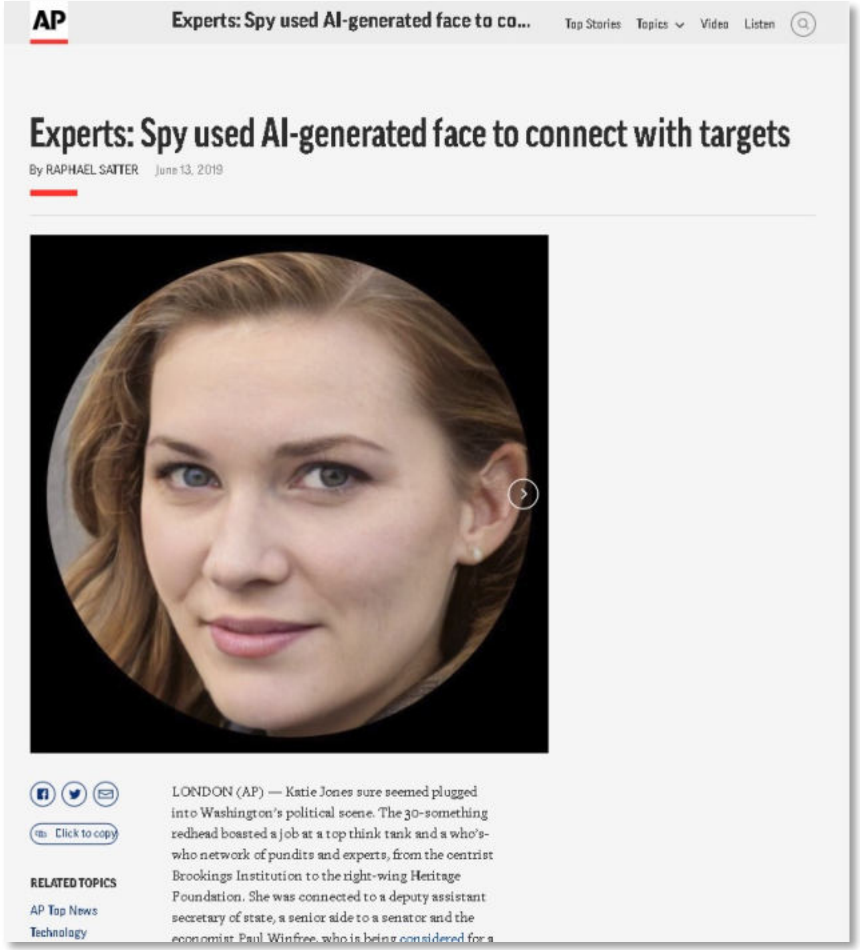
"The bot uses a version of the DeepNude AI tool, which was originally created in 2019, to remove clothes from photos of women and generate their body parts. Anyone can easily use the bot to generate images. More than 100,000 such images have been publicly shared by the bot in several Telegram chat channels associated with it. "

https://www.wired.com/story/telegram-still-hasnt-removed-an-ai-bot-thats-abusing-women/

Fake Identities

But Katie Jones doesn't exist, The Associated Press has determined. Instead, the persona was part of a vast army of phantom profiles lurking on the professional networking site LinkedIn. And several experts contacted by the AP said Jones' profile picture appeared to have been created by a computer program….

https://apnews.com/article/bc2f19097a4c4fffaa00de6770b8a60d


AP | Experts: Spy used AI-generated face to co... | Top Stories | Topics | Video | Listen

Experts: Spy used AI-generated face to connect with targets

By RAPHAEL SATTER June 13, 2019

Click to copy

RELATED TOPICS
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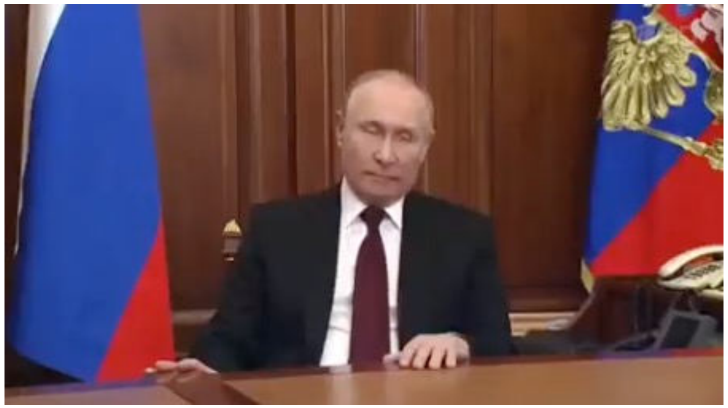
LONDON (AP) — Katie Jones sure seemed plugged into Washington's political scene. The 30-something redhead boasted a job at a top think tank and a who's-who network of pundits and experts, from the centrist Brookings Institution to the right-wing Heritage Foundation. She was connected to a deputy assistant secretary of state, a senior aide to a senator and the economist Paul Winfree, who is being considered for a

DeepFakes and National (cyber)Security

A 68-second deepfake video appeared in March 2022 during the third week of Russia's invasion in Ukraine, depicting Ukrainian President Volodymyr Zelenskyy calling for the surrender of arms. The video appeared on a compromised Ukrainian news web site and was then widely circulated on social media.
https://nypost.com/2022/03/17/deepfake-video-shows-volodymyr-zelensky-telling-ukrainians-to-surrender/

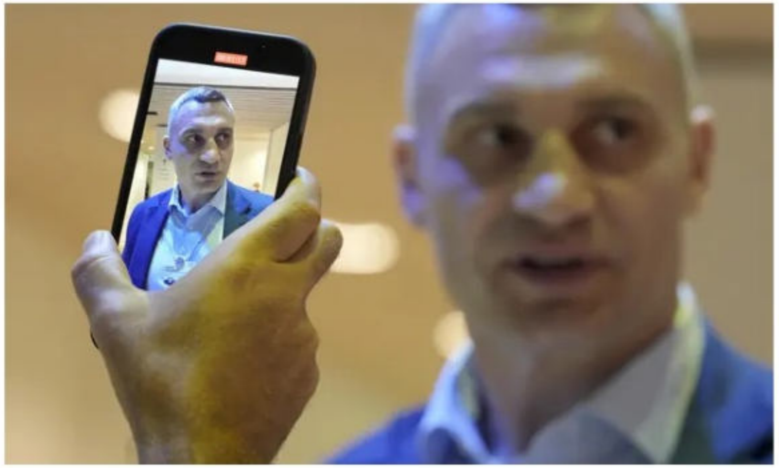


A few days later a video was circulated on social media that supposedly showed Russian President Vladimir Putin announcing that the Russian military was surrendering. A tweet sharing the video with a caption prompted Russian soldiers to lay down their weapons and go home.
https://www.snopes.com/fact-check/putin-deepfake-russian-surrender

DeepFakes and National (cyber)Security

European politicians duped into deepfake video calls with mayor of Kyiv

Person who sounds and looks like Vitali Klitschko has spoken with mayors of Berlin, Madrid and Vienna



Someone has been impersonating the mayor of Kyiv, Vitali Klitschko – the real one seen here. Photograph: Markus Schreiber/AP

The mayors of several European capitals have been duped into holding video calls with a deepfake of their counterpart in Kyiv, Vitali Klitschko.

The mayor of Berlin, Franziska Giffey, took part in a scheduled call on the Webex video conferencing platform on Friday with a person she said looked and sounded like Klitschko.

… The mayor of Berlin, Franziska Giffey, took part in a scheduled call on the Webex video conferencing platform on Friday with a person she said looked and sounded like Klitschko.

“There were no signs that the video conference call wasn’t being held with a real person,” her office said in a statement.

https://www.theguardian.com/world/2022/jun/25/european-leaders-deepfake-video-calls-mayor-of-kyiv-vitali-klitschko

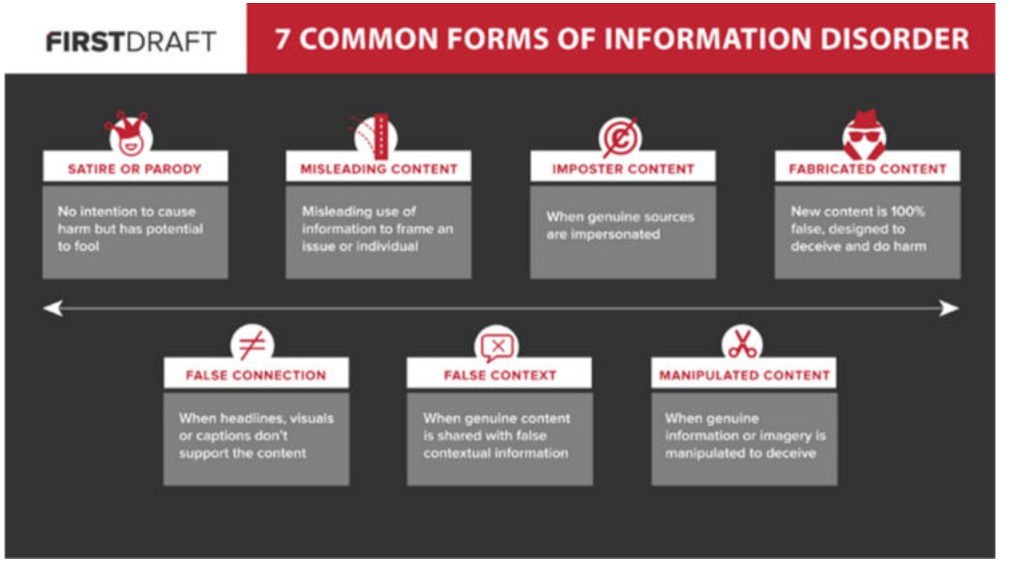
Face Swapping apps: DeepFakes going Mainstream

“The app [Reface] normalises deepfakes, and not everyone understands the concerns arising from them because not everyone has the digital know-how to differentiate what is real and what isn’t,” Apurva Singh, a privacy expert and volunteer legal counsel at Software Freedom Law Center, India….

https://www.vice.com/en/article/wxqkbn/viral-reface-app-going-to-make-deepfake-problem-worse

Visual disinformation comes in many forms

- Manipulated photos/video
- Deepfakes
- Visuals out of context
- False connections
- Visual memes



https://medium.com/1st-draft/information-disorder-part-3-useful-graphics-2446c7dbb485

…many different methods and tools are needed

MeVer tools deal with multiple information aspects

Content

- Image Verification Assistant
- DeepFake Detection
- Visual Location Estimation

Context

- Near-duplicate Detection
- Context Aggregation and Analysis

Propagation

- Network Analysis and Visualization

MKLab “historical” background

2011-2014

Trend detection
Social media search

2013-2016

Quality & veracity of social media
Media forensics

2016-2018

Social media video verification
Reverse video search

2018-2021

Deepfake detection
Deep learning-assisted forensics and analysis

2020-2024

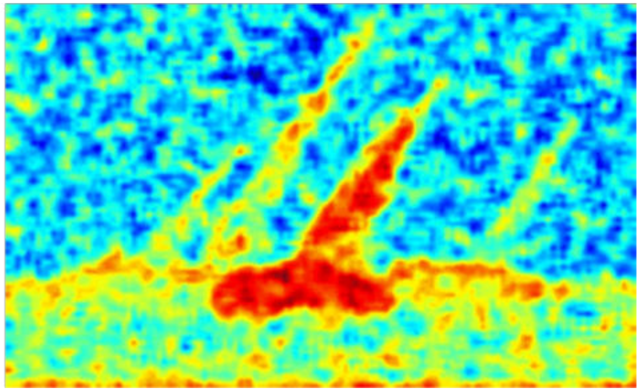
Cross-modal approaches for analyzing manipulated and synthetic media

EU funded projects

Content Verification

Digital image manipulation

- Image tampering localisation: highlight areas in an image that have been digitally manipulated
- Types of tampering:
  - **Splicing**
  - **Inpainting**
  - **Copy-move**
  - Cropping
  - Enhancement

https://www.npr.org/templates/story/story.php?storyId=92442928

Types of tampering localisation algorithms

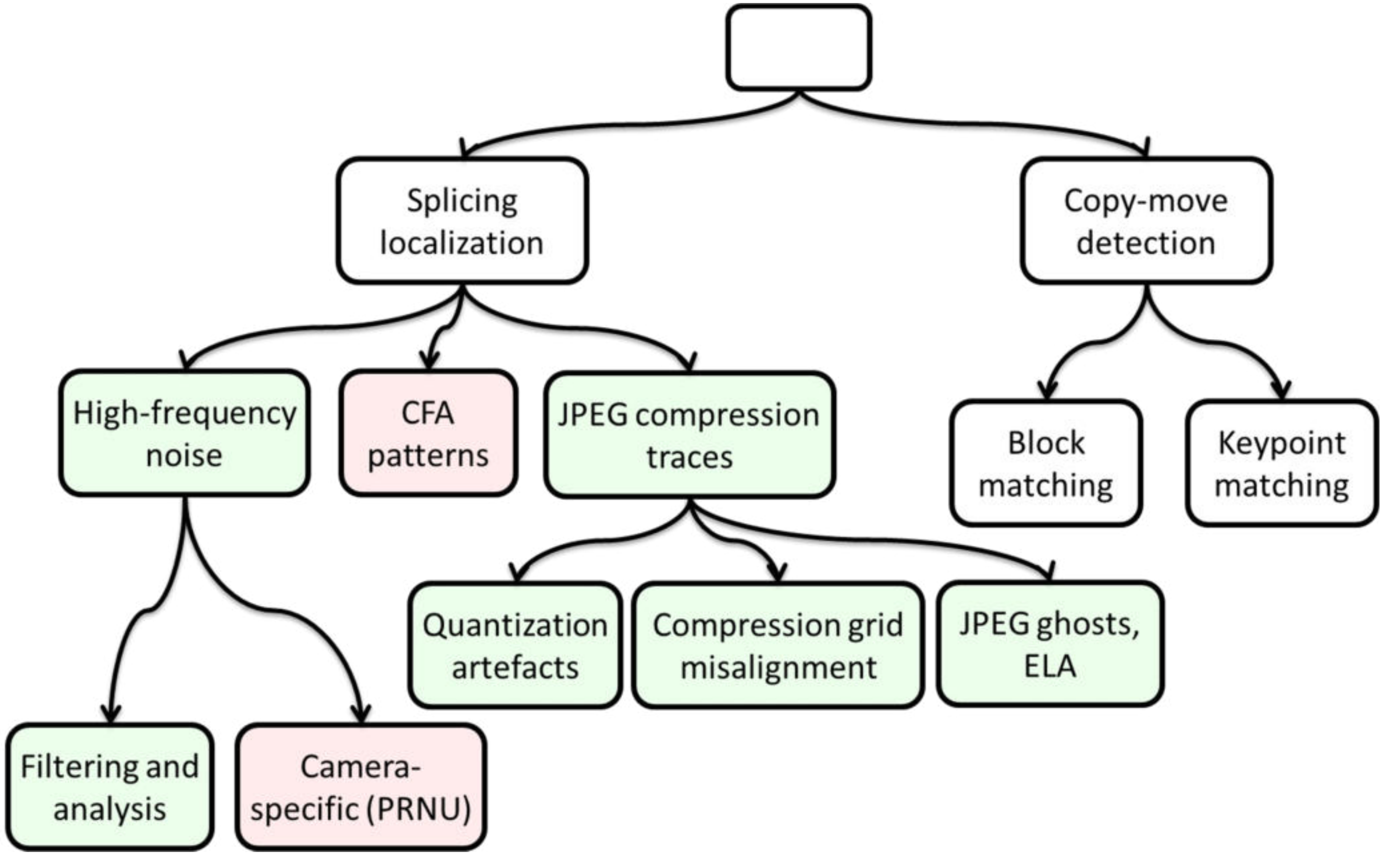
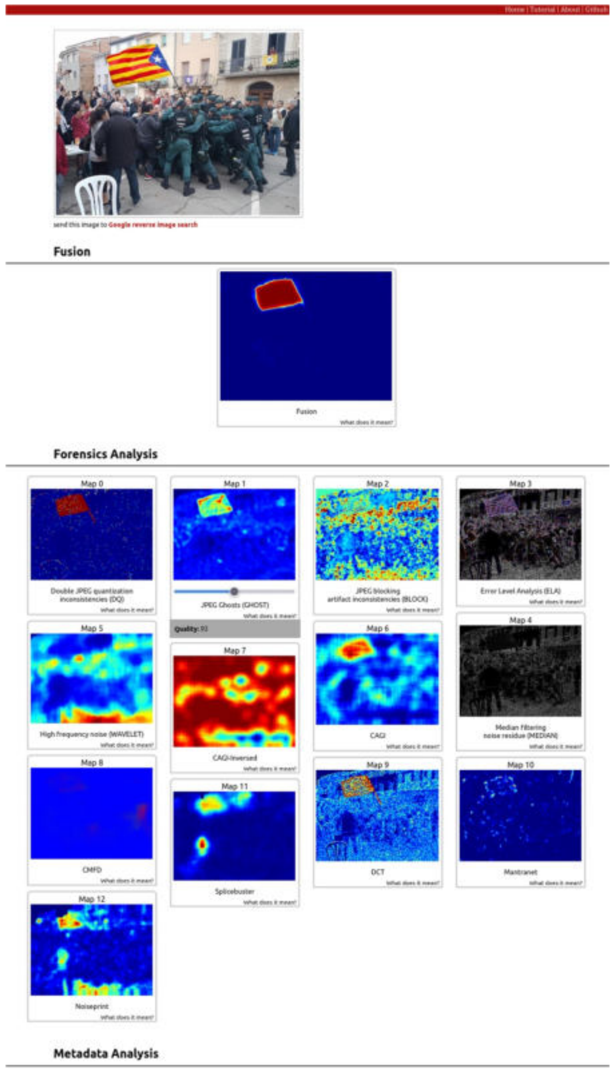


Image Verification Assistant

- Integrates 12 image forensics algorithms and a fusion algorithm
- Allows metadata inspection (EXIF, IPTC, Photoshop and more)
- Estimates the software/hardware origin of JPEG images
- Supports quick reverse image search on Google

https://mever.iti.gr/forensics/

Zampoglou, M., Papadopoulos, S., Kompatsiaris, Y., Bouwmeester, R., & Spangenberg, J. (2016, April). Web and Social Media Image Forensics for News Professionals. In *SMN@ ICWSM*.

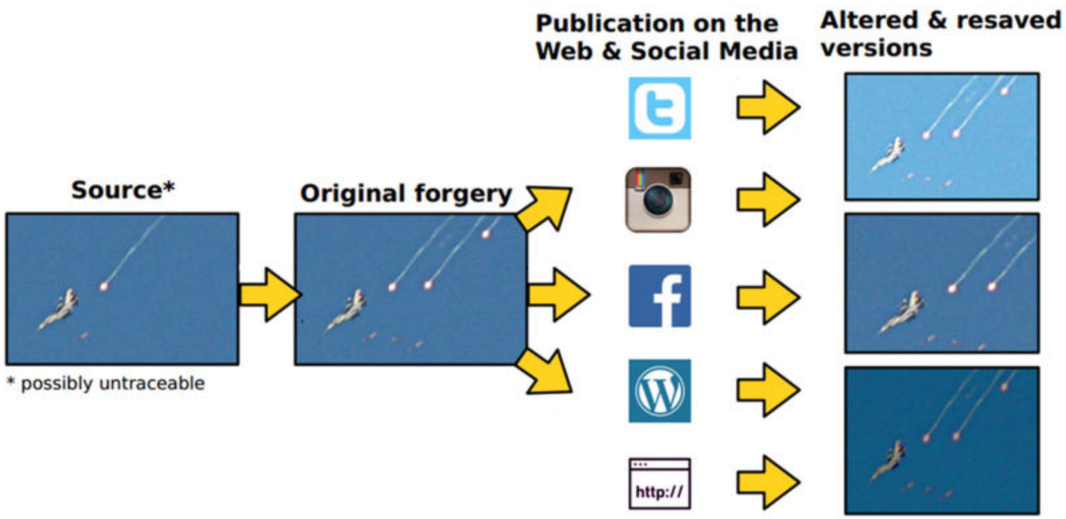


Integrated algorithms

- Error Level Analysis (ELA) (Krawetz, 2007)
- Inconsistencies of JPEG Blocking Artifact (DCT) (Ye et al., 2007)
- JPEG ghosts (Farid, 2009)
- Double JPEG quantization inconsistencies (Lin et al., 2009)
- Median filtering noise residue
- Inconsistencies of JPEG Blocking Artifact (BLK) (Li et al., 2009)
- High-frequency noise analysis (Wavelet) (Mahdian & Saic, 2009)
- SpliceBuster (Cozzolino et al., 2015)
- **CAGI** (Iakovidou et al., 2018)
- MantraNet (Wu et al., 2019)
- Copy move forgery detection (Wu et al., 2018)
- Noiseprint (Cozzolino et al., 2018)
- **Fusion** (Charitidis et al., 2021)

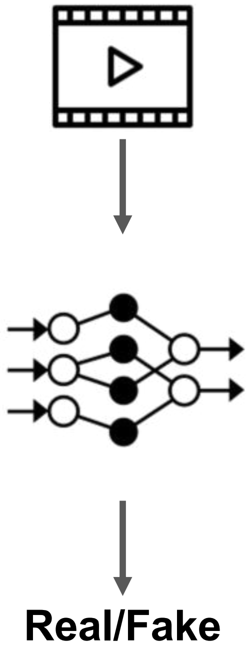
Caveat: Effectiveness of image forensics algorithms

- Certain image forensics algorithms work under very specific conditions
- Internet and social media images are particularly challenging due to multiple recompressions - often applied by the sharing platforms



Zampoglou, M., Papadopoulos, S., & Kompatsiaris, Y. (2015). Detecting image splicing in the wild (web). In *International Conference on Multimedia & Expo Workshops (ICMEW), 2015* (pp. 1-6). IEEE

DeepFake Detection



Common architectures

- CNN
- Visual Transformers (ViT)
- Capsule Networks

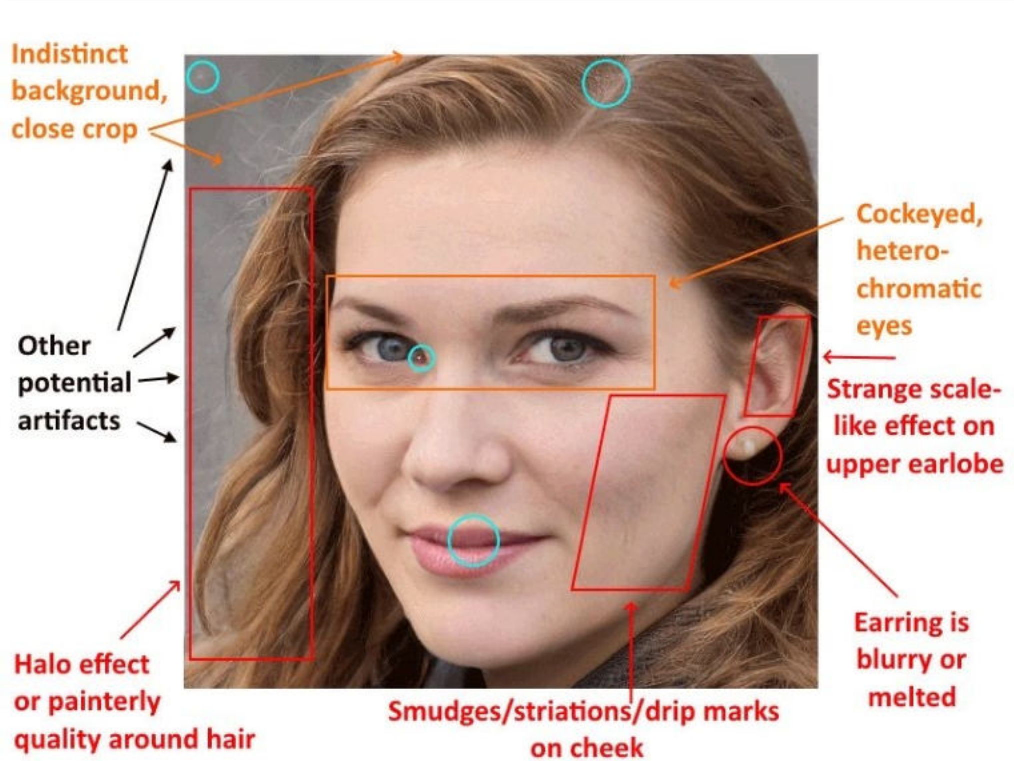
Key Ideas

- Detect abnormal changes in physiological signals e.g. **head poses**, **eye blinking**.
- Exploit left-over manipulation artifacts

Main Problem

Poor generalization to new manipulation techniques.

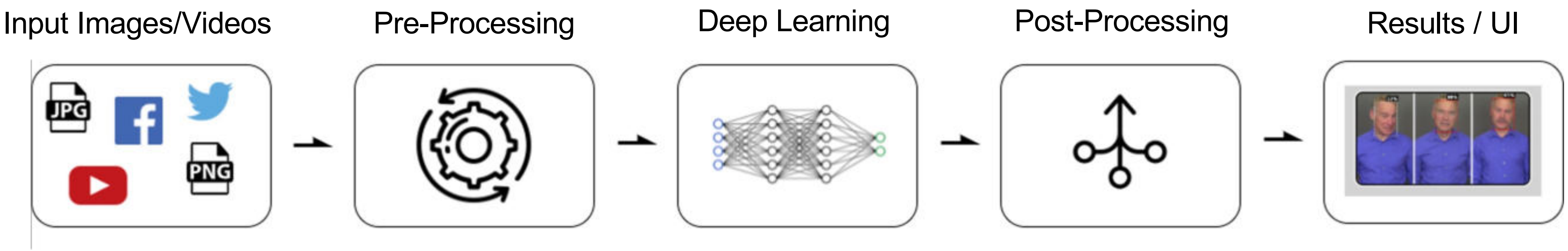
Signs of a DeepFake (in 2020)



https://apnews.com/article/bc2f19097a4c4fffaa00de6770b8a60d

- Different kinds of artifacts
- Blurry areas around lips, hair, earlobs
- Lack of symmetry
- Lighting inconsistencies
- Fuzzy background
- Flickering (in video)

Overview of Approach



Pre-Processing

- Shot segmentation
- 64 frames per shot
- Face detection
- Face filtering
- Face clustering per shot and filtering

Deep Learning

- Ensemble of models (EfficientNet + Transformers)
- Trained on DFDC (120K videos) and WildDeepFake (7314 videos) datasets
- BCE / InfoNCE loss
- DF scores per face

Post-Processing

- Average DF scores per face cluster
- Final prediction is the maximum face DF score
- Result preparation

P. Charitidis, G. Kordopatis-Zilos, S. Papadopoulos and I. Kompatsiaris. “Investigating the Impact of Pre-processing and Prediction Aggregation on the DeepFake Detection Task”. In Proceedings of the Truth and Trust Online, 2020.

DeepFake Detection Services

- DeepWare: online DeepFake scanner and Android application
- DuckDuckGoose: DeepFake detection system and chrome plugin (only for images)
- DeepFake-o-meter: accepts video link or file and results are sent to user’s email

https://deepware.ai//
https://duckduckgoose.ai/
http://zinc.cse.buffalo.edu/ubmdfl/deep-o-meter/

The MeVer DeepFake Detection Service

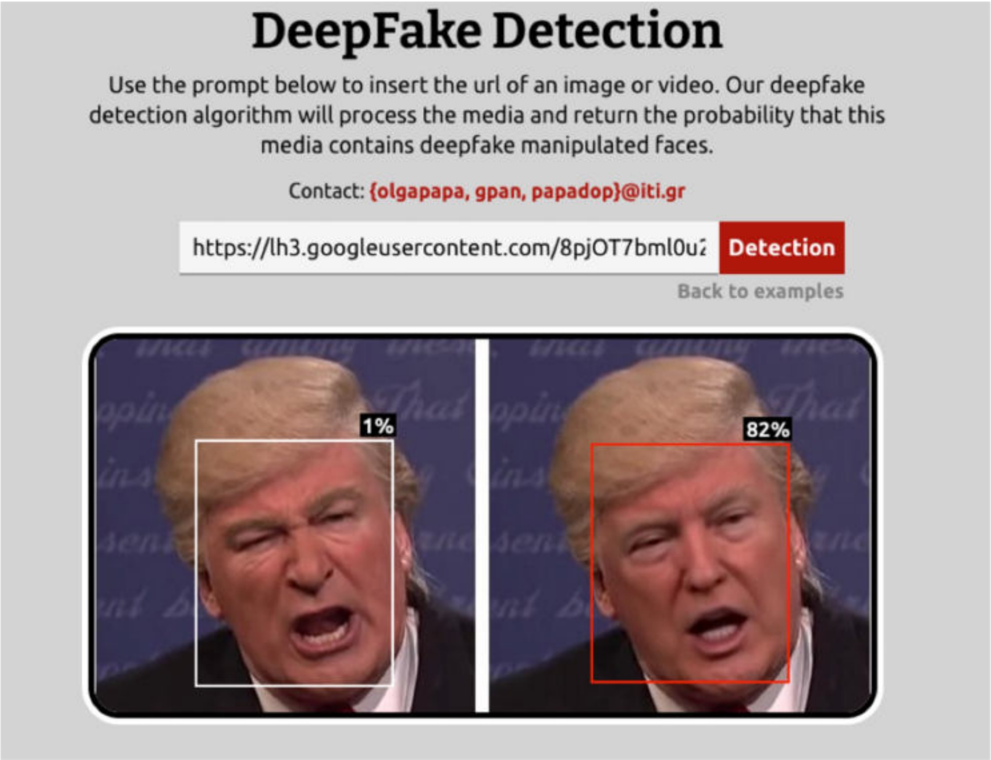
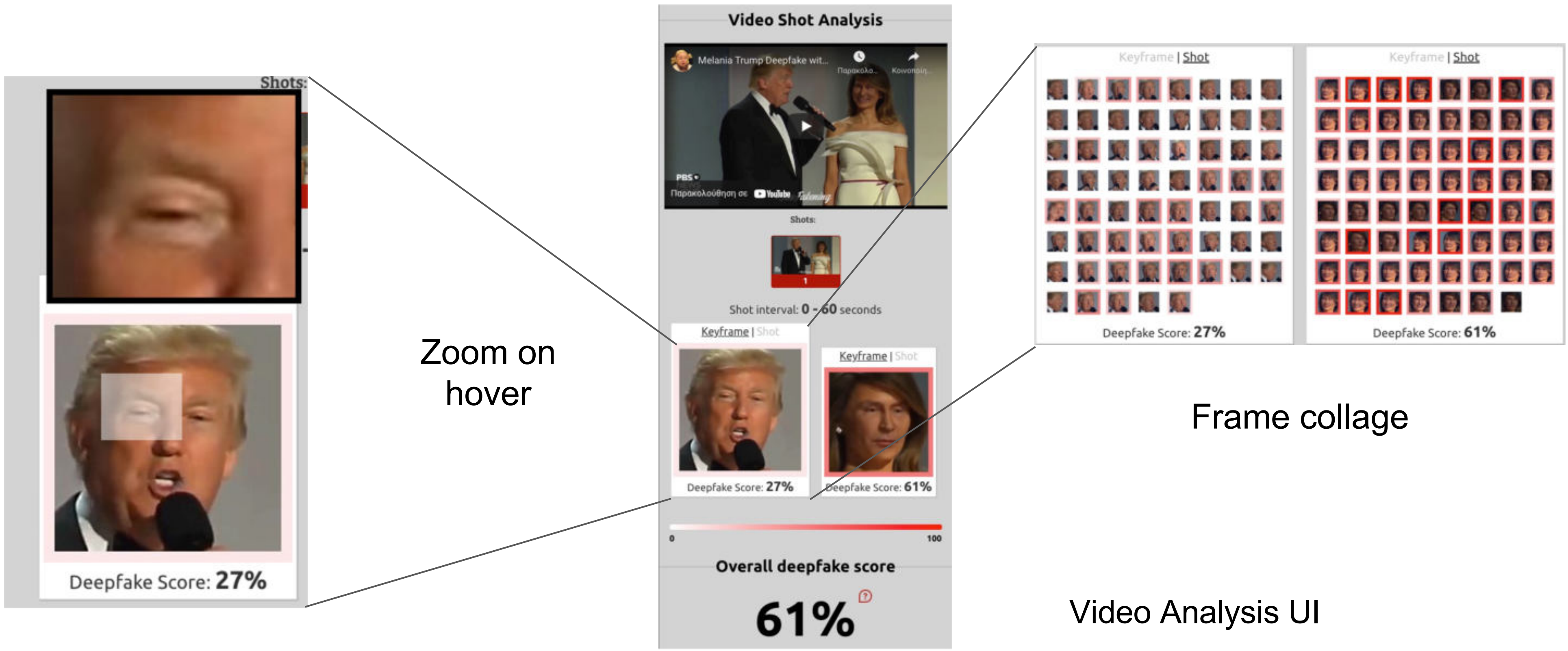


Image Analysis UI

https://mever.iti.gr/deepfake

The MeVer DeepFake Detection Service



Evaluation

Adversarial Robustness

Evasion attack: perform targeted alterations to an image

Projected Gradient Descent: white-box evasion attack

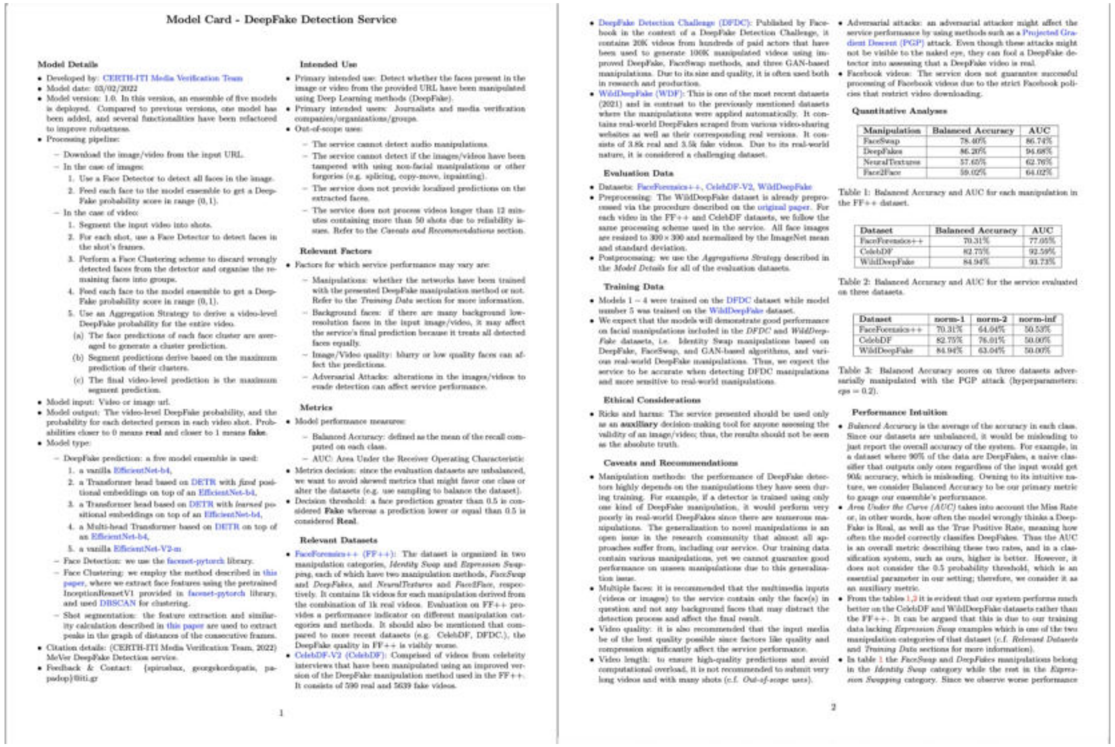
Make use of the [Adversarial Robustness Toolbox (ART) by IBM](https://adversarial-robustness-toolbox.readthedocs.io/en/latest/)

https://adversarial-robustness-toolbox.readthedocs.io/en/latest/

Dataset	norm-1	norm-2	norm-inf
FaceForensics++	70.31%	64.04%	50.53%
CelebDF	82.75%	76.01%	50.00%
WildDeepFake	84.94%	63.04%	50.00%

Model Card

- inform & guide new users
- contains:
  - model architecture details
  - datasets used
  - evaluation results
  - versioning scheme
  - caveats and recommendations
  - factors that affect performance



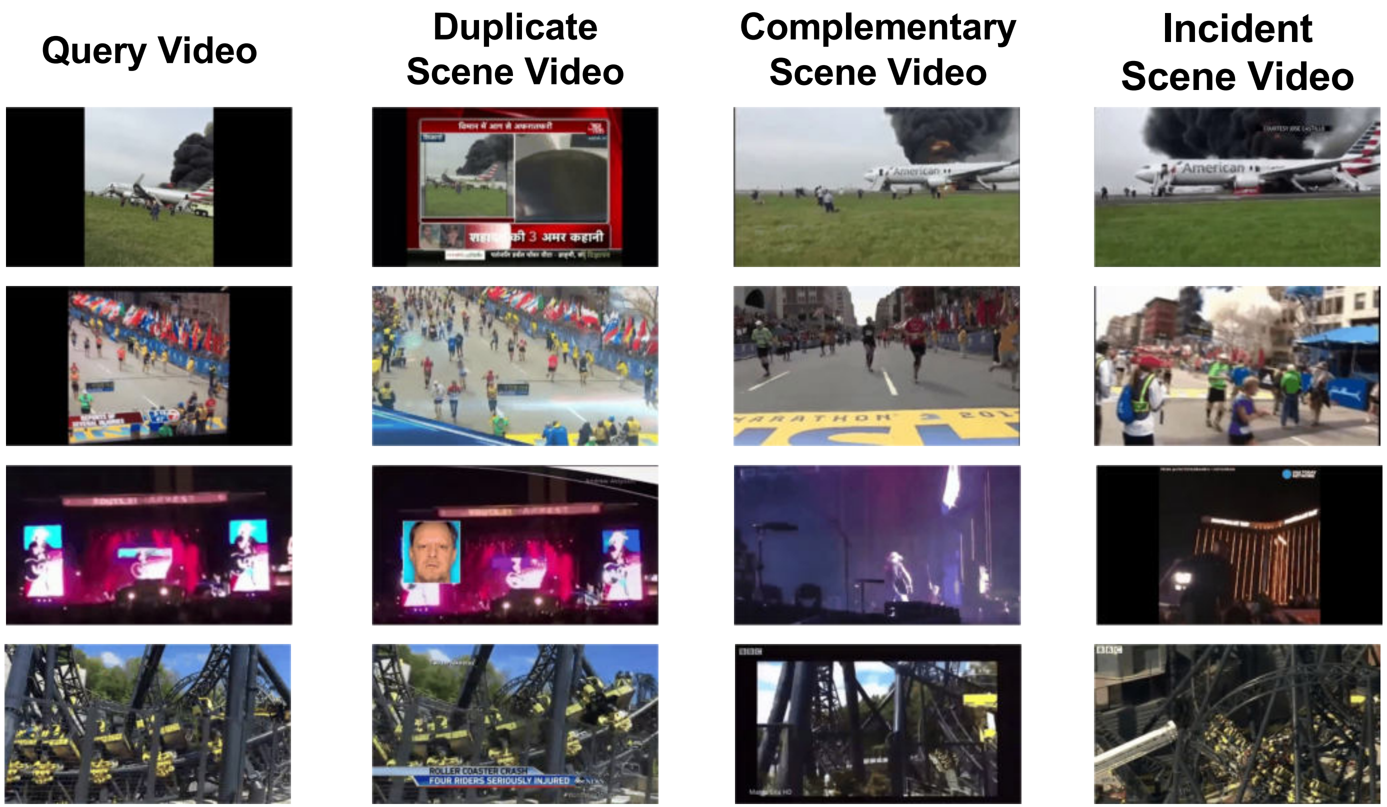
Mitchell, M., Wu, S., Zaldivar, A., Barnes, P., Vasserman, L., Hutchinson, B., ... & Gebru, T. (2019, January). Model cards for model reporting. In *Proceedings of the conference on fairness, accountability, and transparency* (pp. 220-229).

Context Verification

Near-Duplicate Detection

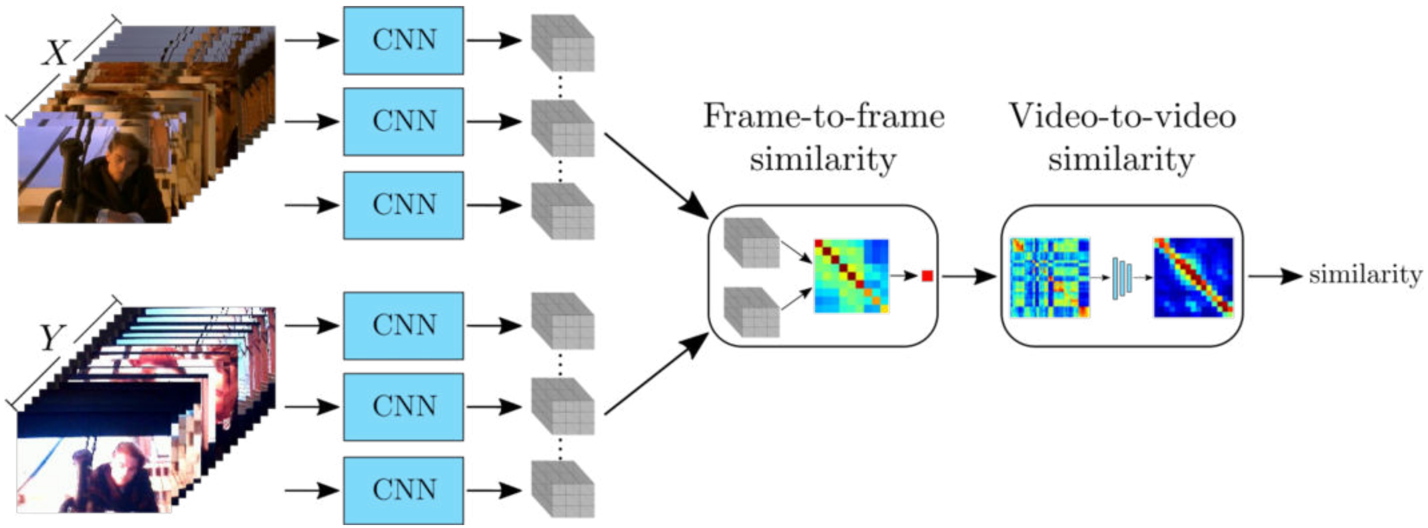
FIVR-200K dataset

- 225,960 videos
- 100 queries
- 4,687 news events
- 4 annotation labels



Kordopatis-Zilos et al. “FIVR: Fine-grained Incident Video Retrieval”. IEEE TMM, 2019

Near-Duplicate Detection

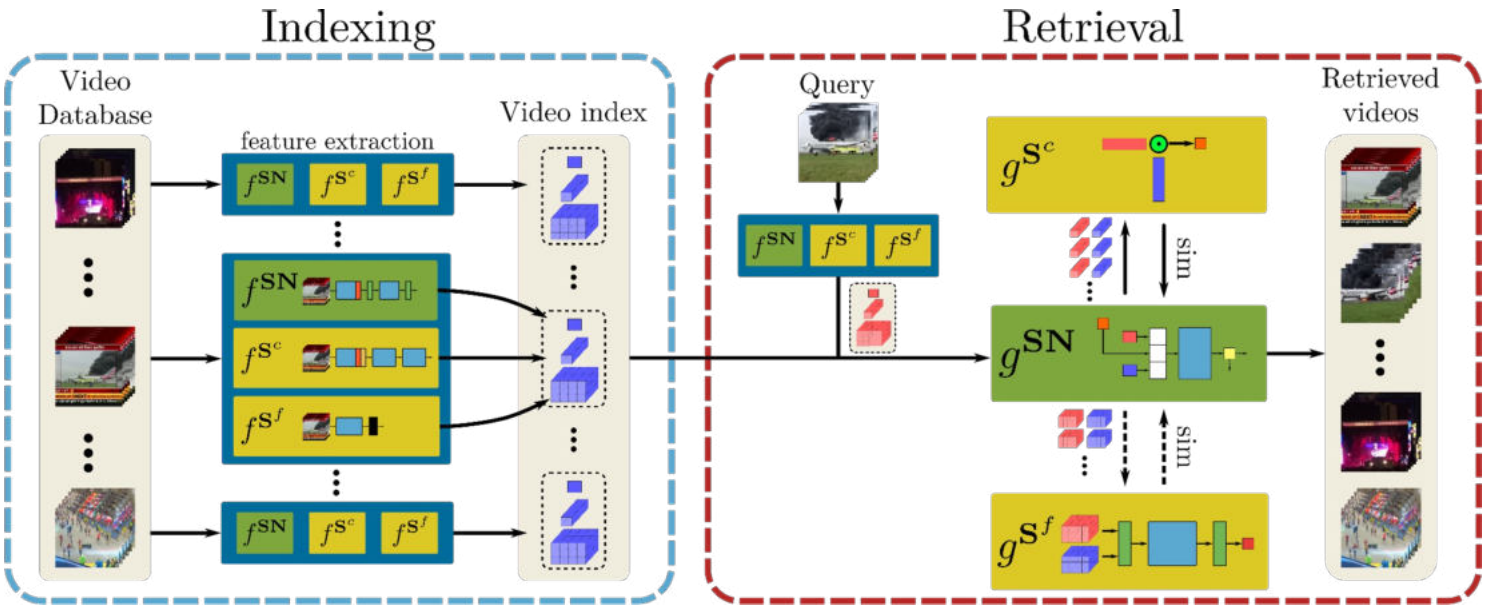


Video Similarity Learning (ViSiL)

- *Fine-grained similarity calculation*
- Learn a video similarity function that considers:
    - *Spatial structure* of video frames (intra-frame relations)
    - *Temporal structure* of videos (inter-frame relations)

Kordopatis-Zilos et al. “ViSiL: Fine-grained spatio-temporal video similarity learning”. ICCV, 2019.

Near-Duplicate Detection



DnS: Distill-and-Select for Video Indexing and Retrieval

- *Knowledge Distillation* from a teacher network to multiple students
  - Different trade-off between accuracy/efficiency
- *Selection Mechanism* between two student networks
  - Select slow but accurate or fast but less accurate student

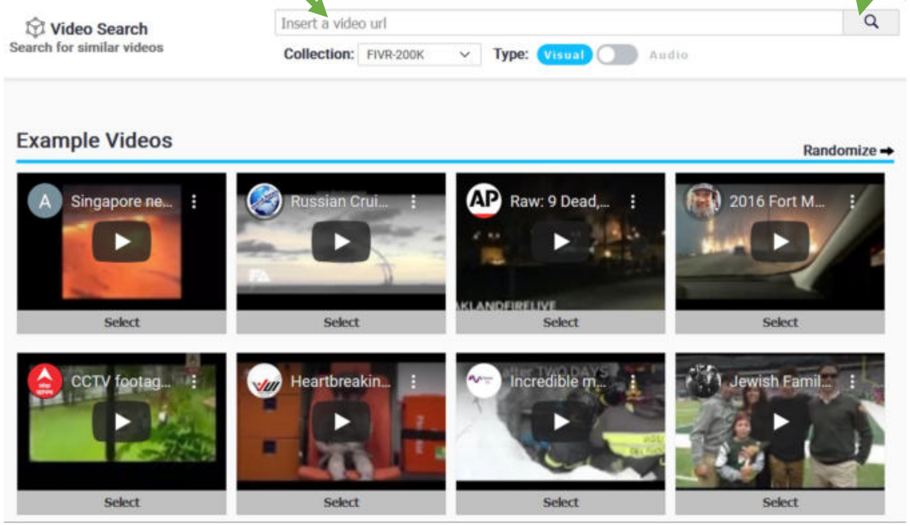
Kordopatis-Zilos et al. “DnS: Distill-and-Select for Efficient and Accurate Video Indexing and Retrieval." IJCV, 2021.

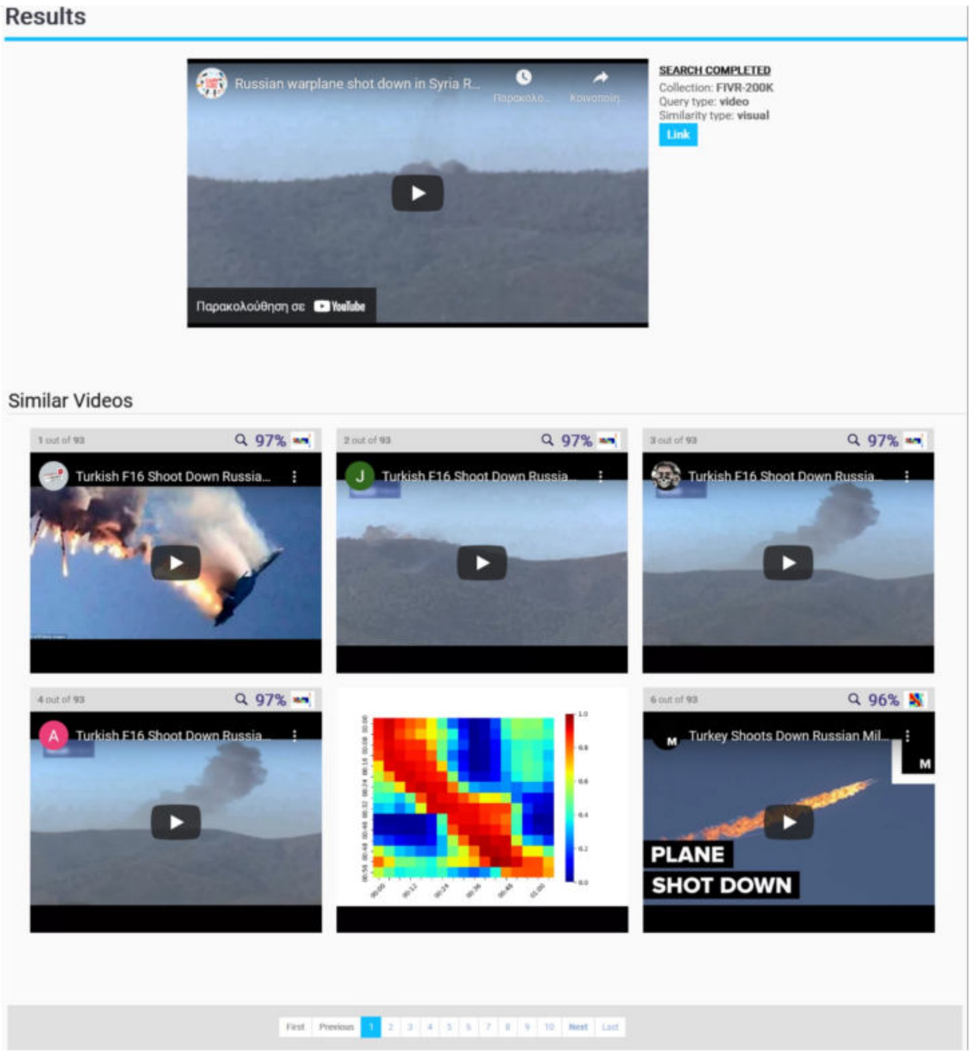
Near-Duplicate Detection

Online demo:
https://mever.iti.gr/video_search/

Provide URL

Start Search

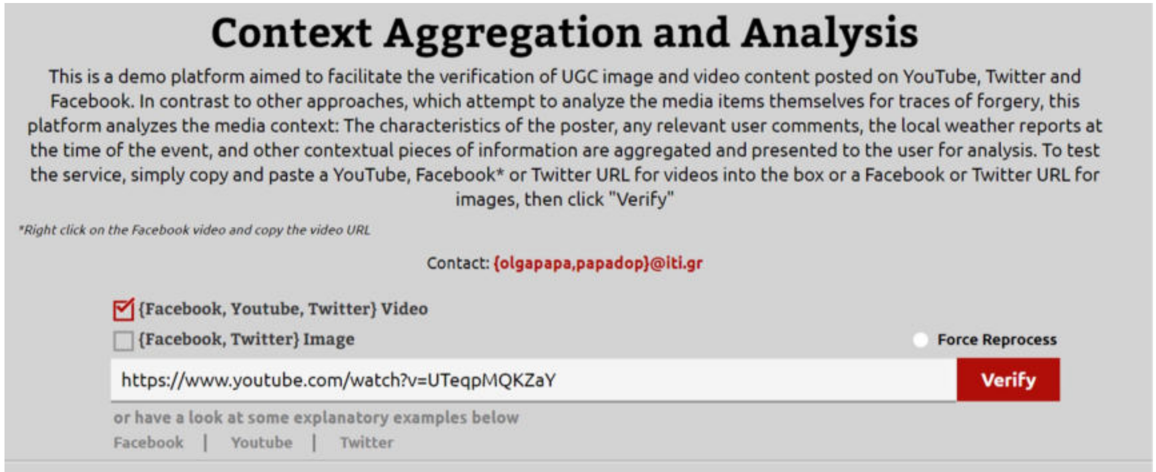


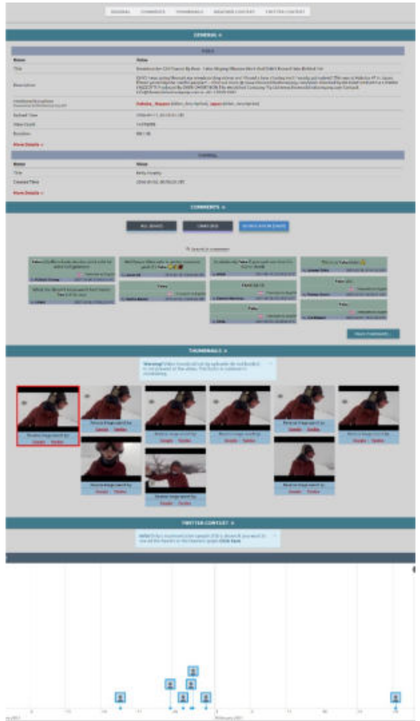


Context Aggregation and Analysis

In contrast to other approaches, which focus on the media items themselves for traces of forgery, this tool analyzes the media context

https://mever.iti.gr/caa/





Papadopoulou, O., Giomelakis, D., Apostolidis, L., Papadopoulos, S., & Kompatsiaris, Y. (2019). Context Aggregation and Analysis: A Tool for User-Generated Video Verification. In SIGIR 2019 Workshop on Reducing Online Misinformation Exposure (ROME 2019)

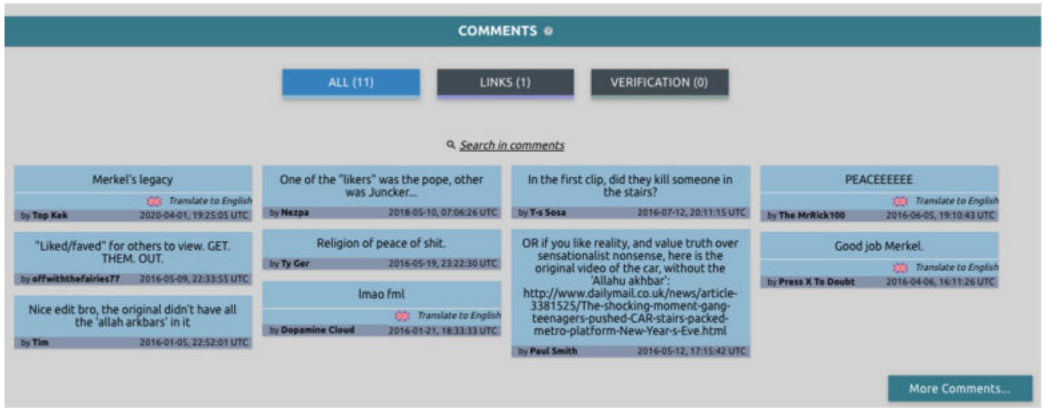
Papadopoulou, O., Zampoglou, M., Papadopoulos, S., & Kompatsiaris, I. (2019). Verification of Web Videos Through Analysis of Their Online Context. In Video Verification in the Fake News Era (pp. 191-221). Springer, Cham.

Context Aggregation and Analysis

Video and channel/user metadata

Comments:

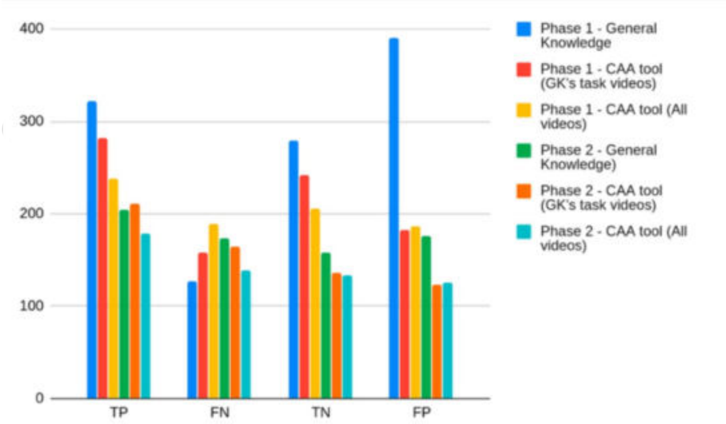
- All comments left below the video
- Links: comments containing links
- Verification: comments containing a verification-related keyword (pre-defined set of keywords)



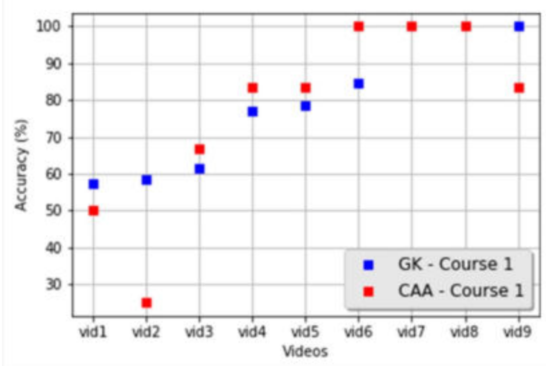
Context Aggregation and Analysis

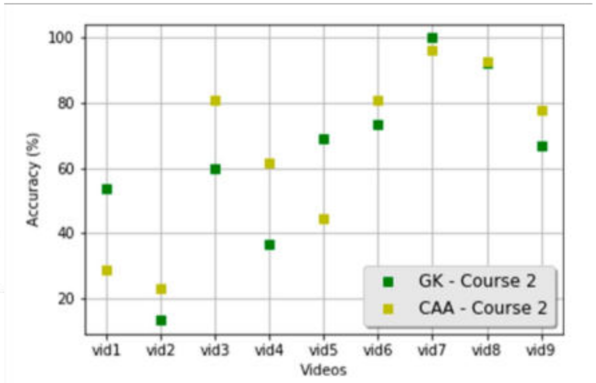
Fake Verification Corpus: Corpus of debunked and verified user-generated videos.

Study on the verification of news video content derived from social media platforms, using the CAA tool and a semi-automated verification practice.



Average time needed for the verification process





Average accuracy per video in GK (without CAA tool) and CAA tool tasks for the same set of fake videos.

Papadopoulou, O., Zampoglou, M., Papadopoulos, S., & Kompatsiaris, I. (2018). A corpus of debunked and verified user-generated videos. Online information review, 43(1), 72-88.

Giomelakis, D., Papadopoulou, O., Papadopoulos, S., & Veglis, A. (2021). Verification of News Video Content: Findings from a Study of Journalism Students. Journalism Practice, 1-30.

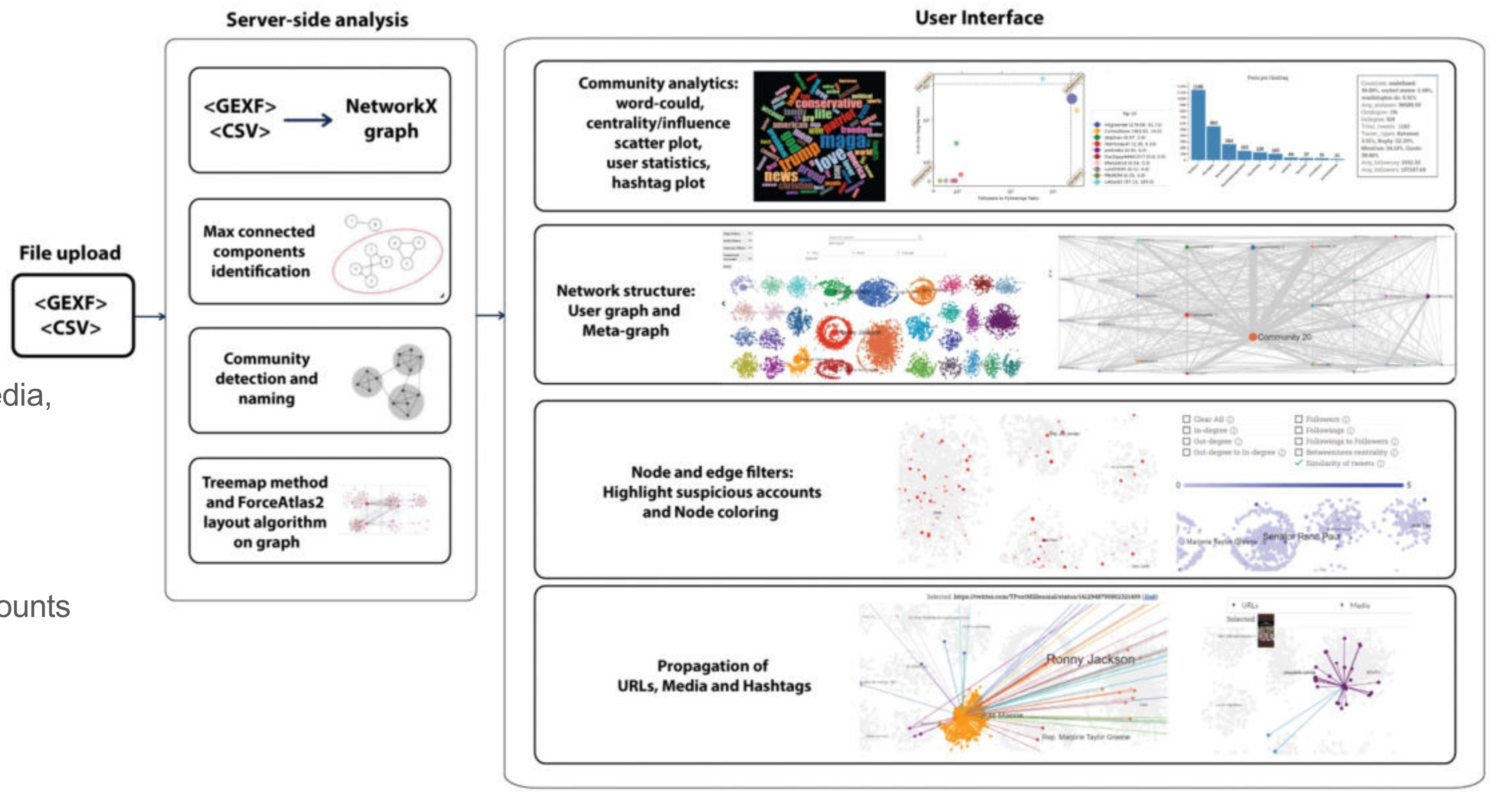
Information Propagation

Network Analysis and Visualization

MeVer NetworkX analysis and visualization tool helps users delve into **social media conversations**, helps users gain insights about how information propagates, and provides intuition about communities formed via **interactions**.

Features:

- Individual Account and Post Inspections
- Community Detection
- Community Analytics
- Metagraph
- Propagation of URLs, Media, and Hashtags
- Node and Edge Filters
- Node Coloring
- Highlight Suspicious Accounts



Network Analysis – Suspicious Accounts

- **Following rate** is the ratio of the number of followings to the number of days since an account was first created.
- **Status rate** is the ratio of the number of posts to the number of days since an account was created.
- **Average mentions per post** shows the average number of mentions in an account's tweets. A common strategy for spreading disinformation is mentioning many accounts in tweets.
- **Average mentions per word** shows the average number of mentions in a tweet's text. The tactic of posting tweets with many mentions and a single hashtag is often regarded as spam-like or suspicious. This feature is normalized to the total number of posts.
- **Average hashtags per word** calculates the average number of hashtags in a tweet's text.
- **Average URLs per word** calculates the average number of URLs in a tweet's text.

Support Twitter, Facebook and Telegram

Network Analysis and Visualization - Analysis

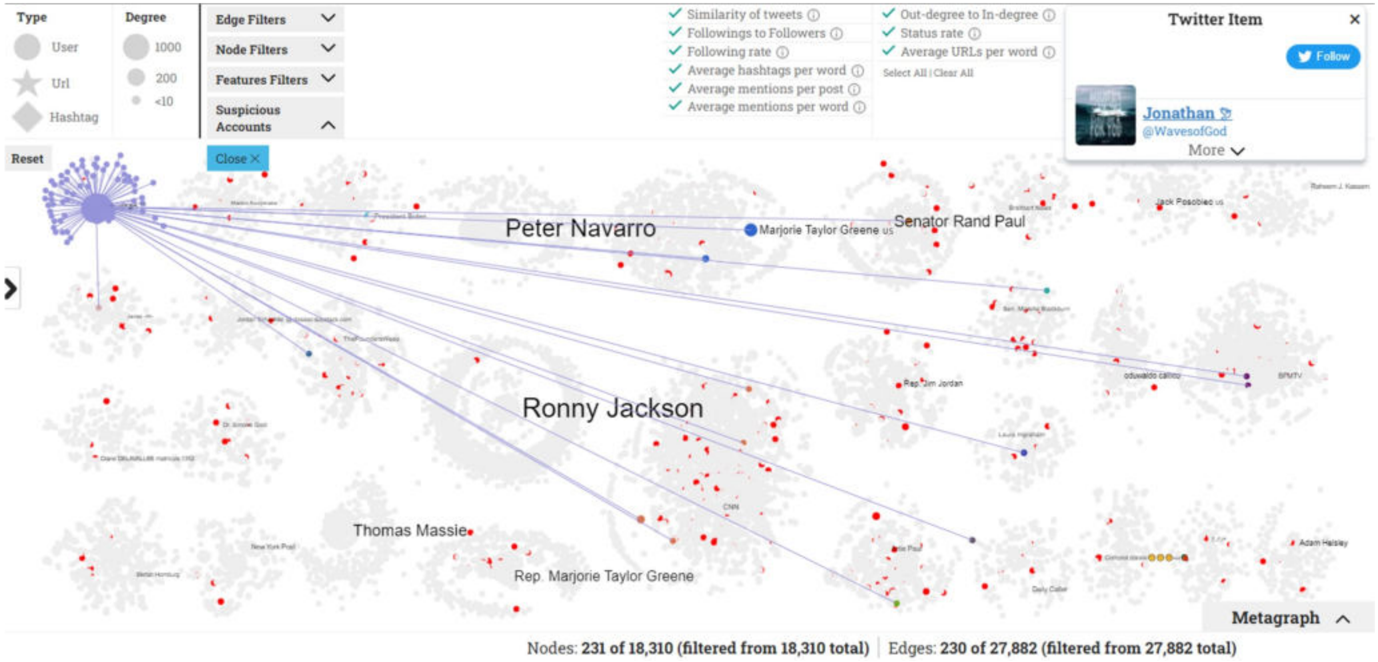
Four use cases to simulate a scenario in which, through the tool, an end user tries to identify and inspect suspicious accounts within a given dataset graph.

Fauci use case

425 accounts out of 18,310 highlighted as suspicious.

@WavesofGod (Community 14)

- Mentioned 228 other accounts in its tweets
- Mentioned popular accounts: President's Biden (POTUS) and Marjorie Taylor Greene ("mtgreenee").
- It is a strong supporter of Christianity and against vaccination.



This account has been suspended from Twitter

https://mever.iti.gr/networkx/

Papadopoulou, O., Makedas, T., Apostolidis, L., Poldi, F., Papadopoulos, S., & Kompatsiaris, I. (2022). MeVer NetworkX: Network Analysis and Visualization for Tracing Disinformation. Future Internet, 14(5), 147.

Key Challenges in AI against Disinformation

- Arms race nature of problem
  - Constantly improved AI models for synthetic media
  - New disinformation tactics
- Gap between research and end users
  - Journalists/fact-checkers need intuitive tools
  - Tools need to be robust and trustworthy
- Risks of discrimination
  - AI models might be biased against certain demographics
  - Use of AI models might be done in a biased manner
- Sustainability
  - AI costs a lot in terms of research, maintenance and deployment
  - Fighting disinformation is not a profitable business
- Required contribution from various disciplines
  - Content Analytics - NLP, Machine Learning, Network Analysis, Big Data Architectures,
  - Psychology – Social Sciences (patterns of presentation, sharing),Visualization

- **Continual learning**
- **Out-of-domain generalization**

- **Explainability**
- **Human agency**
- **Robustness**

- **AI fairness**

- **Green AI**
- **Model compression**
- **Knowledge distillation**

Emerging Challenges: Metaverse

"…we might experience a ***hyper-realistic VR environment that might make it much more difficult to assess media authenticity****. This is due to the fact that media assets like images and videos are blended in a more natural way in the VR environment, which could arguably increase the cognitive load for the human brain (more cognitive-neuroscience studies would be needed to study this)…."*

vera.ai EC project

https://www.nytimes.com/2022/10/09/technology/meta-zuckerberg-metaverse.html

Human Behaviour related challenges

Cyberpsychology, Behavior, and Social Networking, Vol. 22, No. 6 | Rapid Communications   Free Access

What Debunking of Misinformation Does and Doesn't

Jeong-woo Jang, Eun-Ju Lee, and Soo Yun Shin

Published Online: 7 Jun 2019 | https://doi.org/10.1089/cyber.2018.0608

… **participants' agreement with the news position was not attenuated by the explicit post hoc correction**. Considering that information is judged as truth when it meets intuitive evaluation criteria (e.g., familiarity, compatibility with existing knowledge)… **debunking its falsehood may not be sufficient to undo it**.

Cyberpsychology, Behavior, and Social Networking > Vol. 25, No. 10 > Original Articles   Free Access

How Health-Related Misinformation Spreads Across the Internet: Evidence for the "Typhoon Eye" Effect

Lei Zheng, Jincheng Cai, Fang Wang, Chenhan Ruan, Mingxing Xu, and Miao Miao

Published Online: 11 Oct 2022 | https://doi.org/10.1089/cyber.2022.0047

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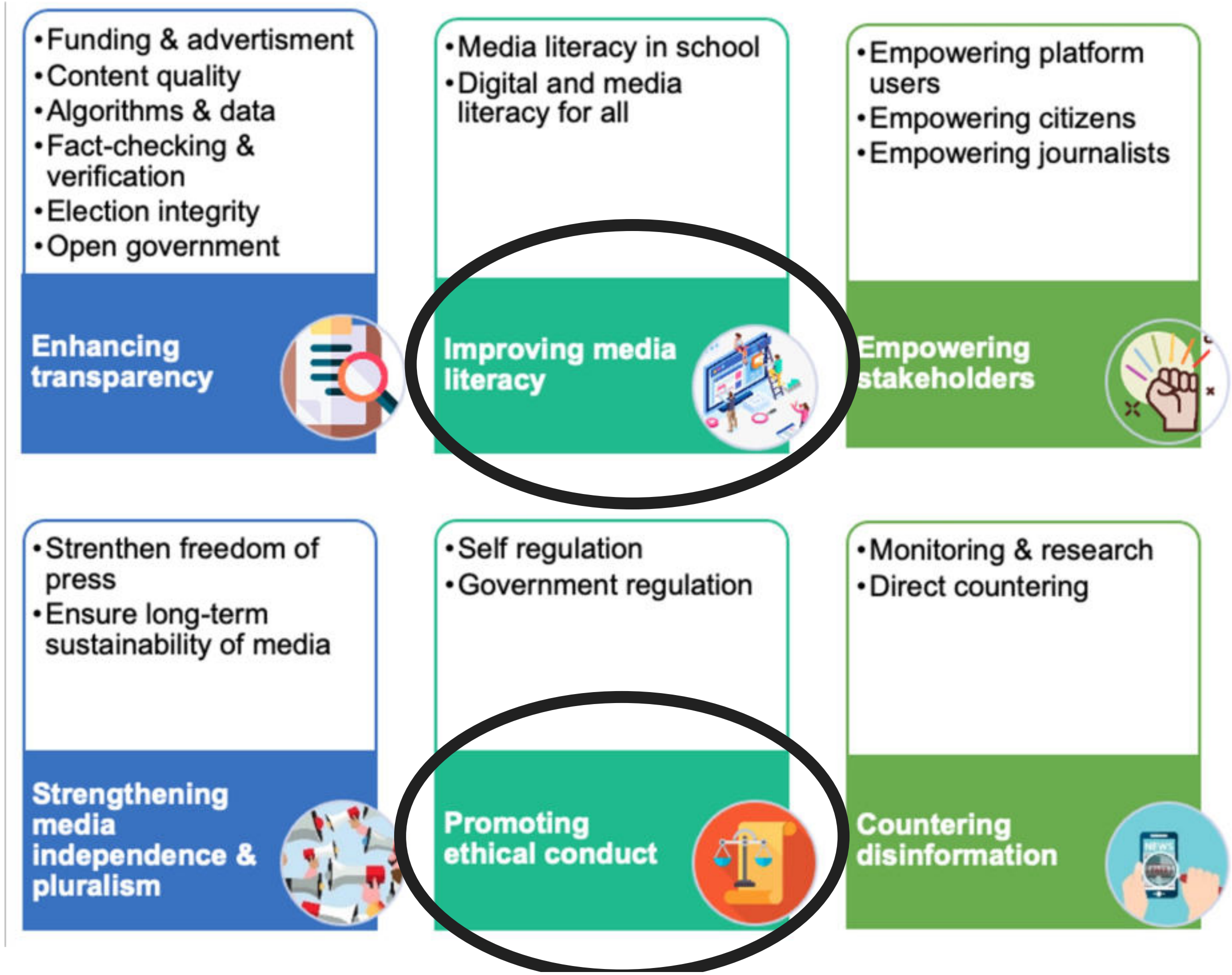
… **Our results highlight the importance of psychological approaches to understanding the propagation patterns of health-related misinformation.** The present findings provide a new perspective for development of prevention and control strategies to reduce the spread of health-related misinformation during pandemics …

Industry ethicist: Social media companies amplifying Americans' anger for profit

NOVEMBER 6, 2022 / 7:32 PM / CBS NEWS

… The more **moral outrageous language you use, the more inflammatory language, contemptuous language, the more indignation you use, the more it will get shared.** So we are being rewarded for being division entrepreneurs. The better you are at innovating a new way to be divisive, we will pay you in more likes, followers and retweets.…

Counter-disinformation policies classification



PRESS RELEASE | Publication 11 October 2022

Commission steps up action to tackle disinformation and promote digital literacy among young people

The Commission has published Guidelines for teachers and educators in primary and secondary schools, on how to address disinformation and promote digital literacy in their classrooms.

The guidelines provide practical support for teachers and educators and include definitions of technical concepts, class-exercises and how to encourage healthy online habits. This toolkit covers three main topics: building digital literacy, tackling disinformation, and assessing and evaluating digital literacy.

Full press release

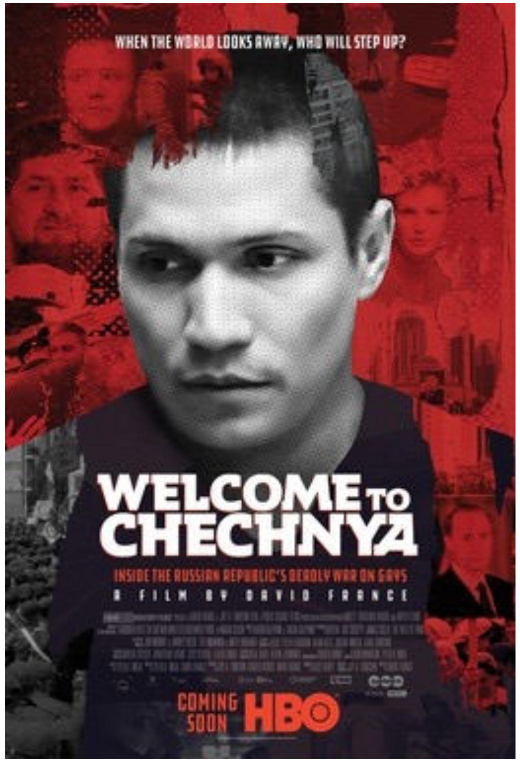
Counter-disinformation policies

The EU is working in close cooperation with online platforms to encourage them to promote authoritative sources, demote content that is fact-checked as false or misleading, and take down illegal content or content that could cause physical harm.

Positive Applications of DeepFakes

Protecting the Identity of Interviewees

- Welcome to Chechnya is a 2020 documentary film by David France
- The film centres on the anti-gay purges in Chechnya of the late 2010s, filming LGBT Chechen refugees using hidden cameras as they made their way out of Russia
- This was the first film to use DeepFake technologies to protect the identities of speakers



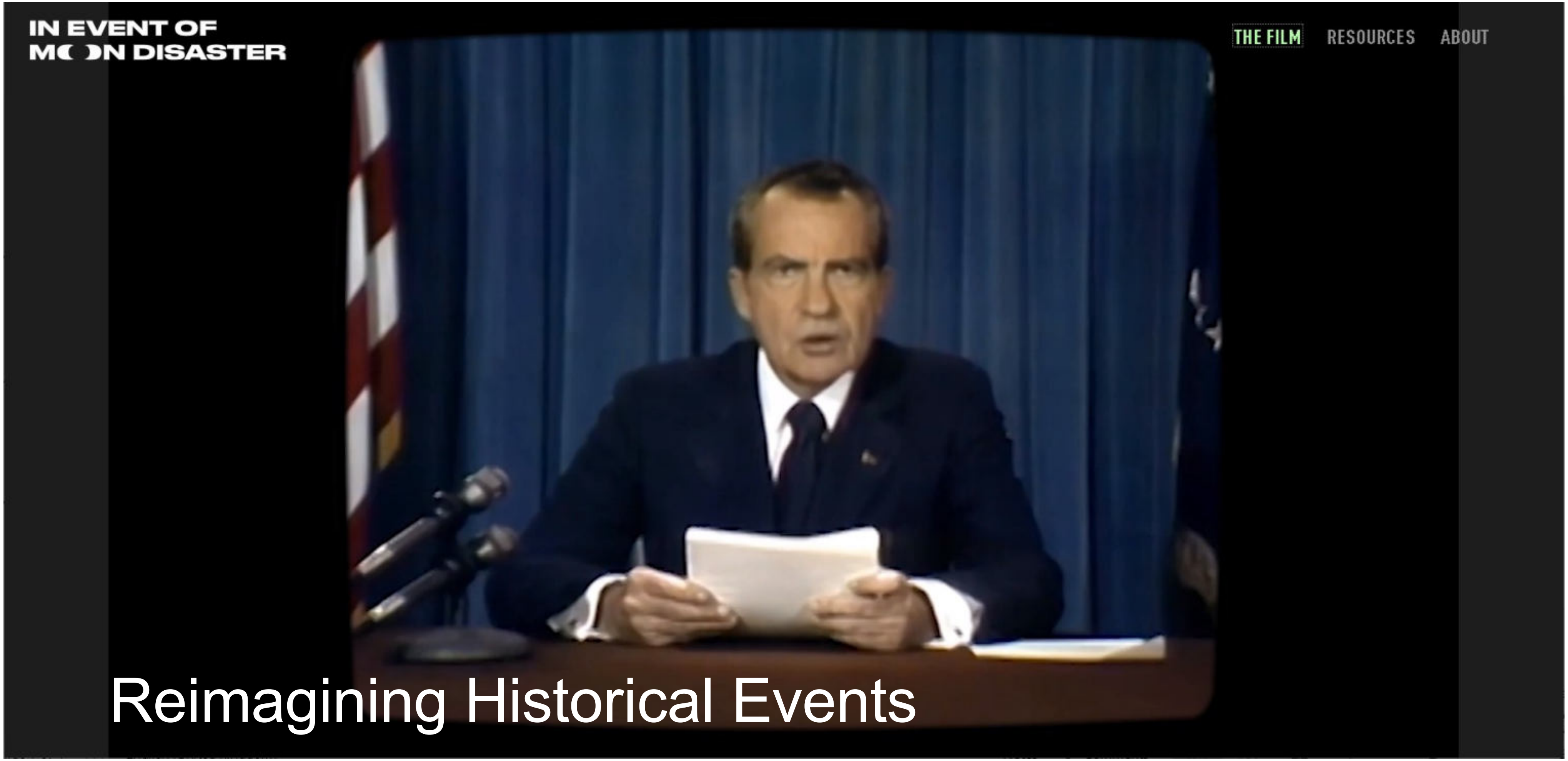
https://en.wikipedia.org/wiki/Welcome_to_Chechnya

Animating Faces from the Past

- DeepNostalgia by my Heritage makes it possible to create animations from still photos, e.g. of historical figures or beloved ones

Dalí Lives

https://www.theverge.com/2019/5/10/18540953/salvador-dali-lives-deepfake-museum



Reimagining Historical Events

https://moondisaster.org/film

Sensitizing about Global Issues

- DeepEmpathy (https://deepempathy.mit.edu/): *increase empathy by making our homes appear similar to the homes of victims of disasters/wars*

- Using DF to Visualize Impacts of Climate Change

Luccioni, A., Schmidt, V., Vardanyan, V., & Bengio, Y. (2021). Using Artificial Intelligence to Visualize the Impacts of Climate Change. IEEE Computer Graphics and Applications, 41(1), 8-14.

FIGURE 2. Before and after example of the transformation carried out by our GAN approach, based on an image of a suburban house.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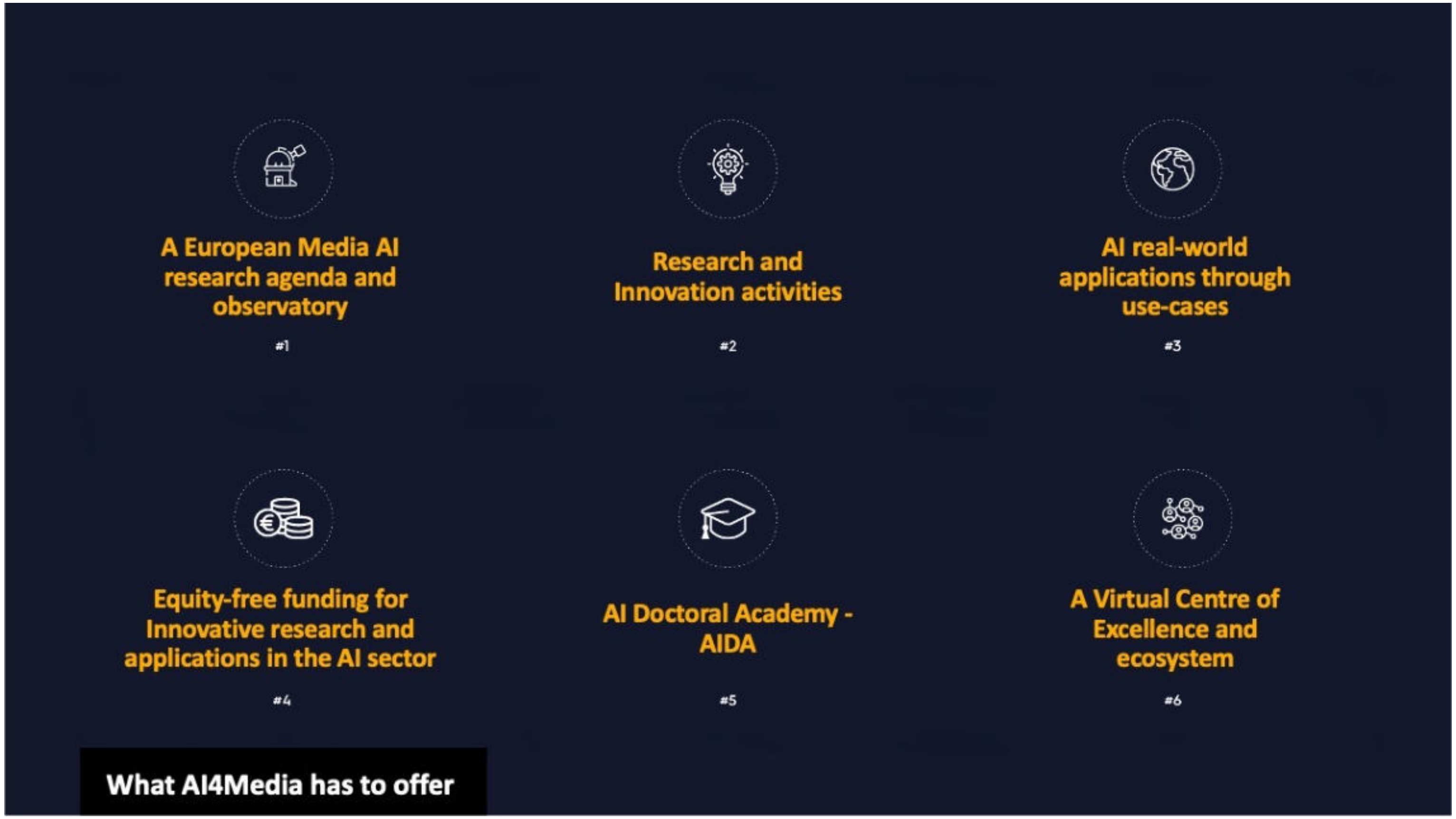
A European Media AI research agenda and observatory
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Research and Innovation activities
#2
AI real-world applications through use-cases
#3
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