

# DeepFakes & Fake News: AI challenges in the media industry

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Bayerische  
Landeszentrale für  
neue Medien

**Introduction**

**Deepfakes**

**Open Source  
Intelligence**

**Outlook**

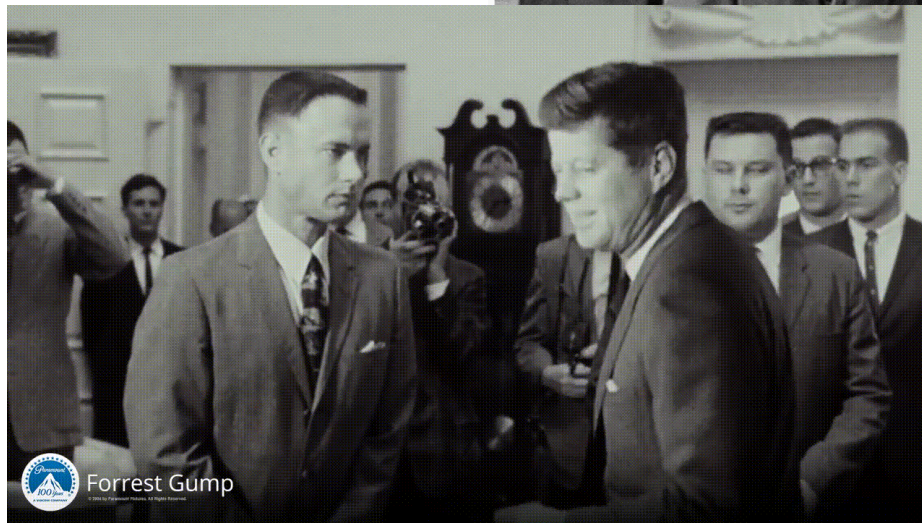
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# Manipulating video is not new!



Forrest Gump, 1994: filmmakers digitally inserted archival footages of JFK into this scene and manipulated his mouth movements.

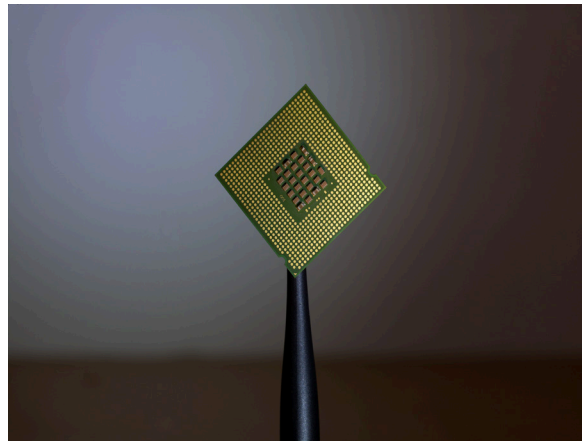


# Why now?

Algorithms



Resources



Data



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# Deep Learning Fake News

How



Threats



Solutions

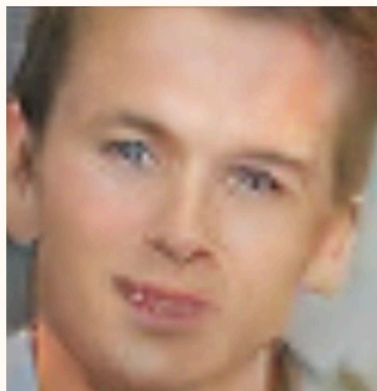


# Increasingly realistic synthetic faces

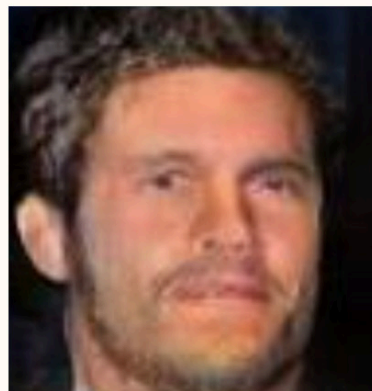
Deepfake technology - *Generative Adversarial Networks (GANs)*



2014



2015



2016



2017

*GANs*

*DeepFakes*



# Which person is real?



**a**



**b**

- a and c ?
- a and d ?
- b and c ?
- b and d ?

**VOTE time !**



**c**



**d**

# Which person is real?

[Play again.](#)



**a**

**b**

a and c ?

a and d ?

b and c ?

b and d ?



**c**



**d**



**F** **A** **K** **E**  
**F** **A** **C** **T**



Deepfakes are only the tip of the iceberg...

**>2.1B**

FAKE Facebook accounts disabled in 1Q2019

**<40%**

of deepfake images can be identified by an average person

**3.6T**

FAKE Youtube views per year

**>50%**

of new PhD's reported are FAKE

**\$1.3BN**

Cost of Fake Instagram followers

**>300M**

FAKE Twitter accounts removed each year

**\$17BN**

Lost due to financial misinformation

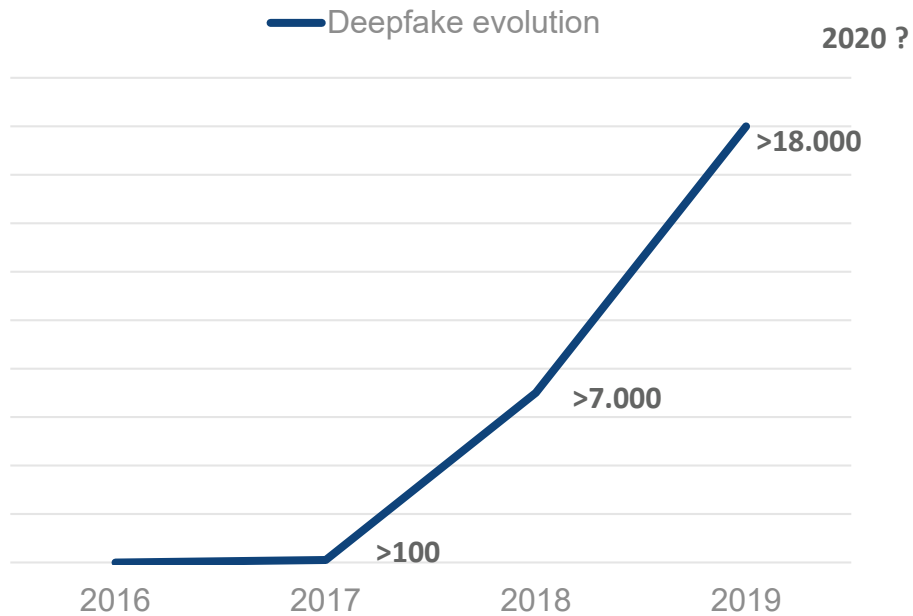
**\$9BN**

Spent repairing corporate reputation

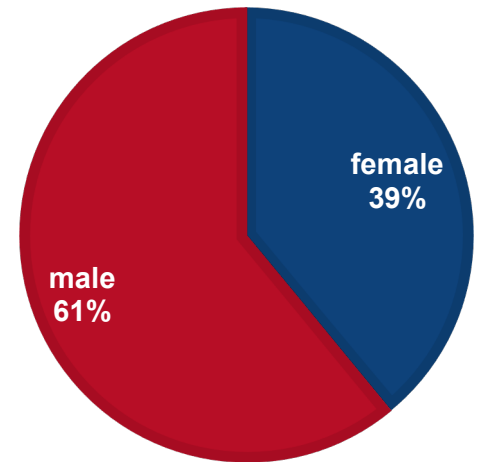
**\$3BN**

Spent by platforms to combat misinformation

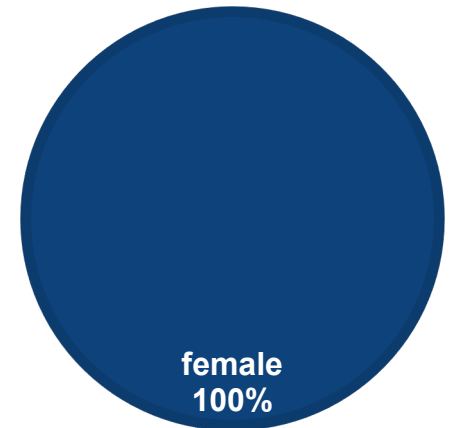
# Threats



YOUTUBE CHANNELS



DEEPPAKE PORNOGRAPHY WEBSITES



# Deepfakes: Now what?

## Solutions

**Invest on technology**

Governments  
Academia  
Private

**Policies and guidelines  
to be used by tech  
platforms to define  
what is harmful**

Policy makers

**Educate**

PSM

# How to detect DFs?

## Deepfakes' "flaws"

### Image :

- Assymetries
- Blob artifacts
- Blurred background / regions
- Artifacts in face boundaries/edges

### Audio:

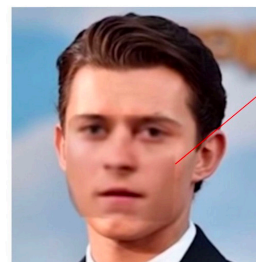
- Lip Sync

### Video:

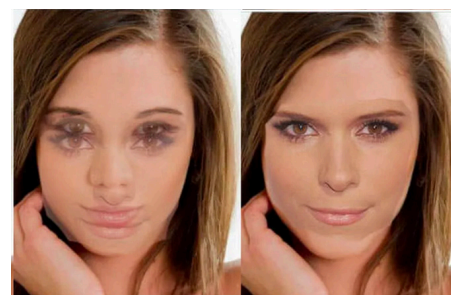
- Real person's movements (head tilt, eyebrows, chin, "soft biometrics")



Blob artifacts in StyleGAN



artifacts in the boundary



Areas where are not over blurred

[https://medium.com/@jonathan\\_hui/detect-ai-generated-images-deepfakes-part-1-b518ed5075f4](https://medium.com/@jonathan_hui/detect-ai-generated-images-deepfakes-part-1-b518ed5075f4)

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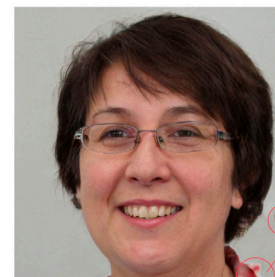
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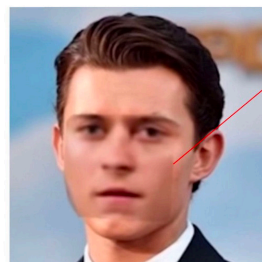
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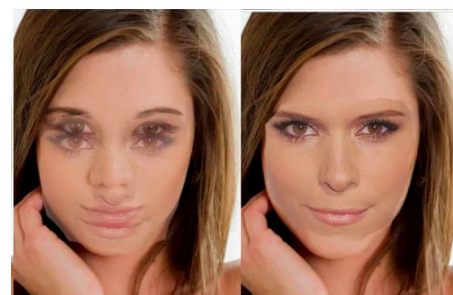
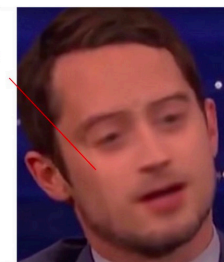
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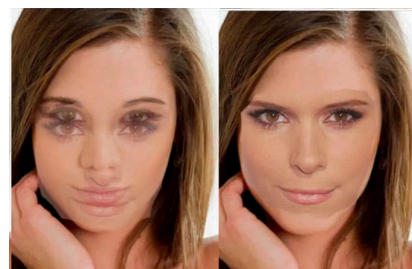
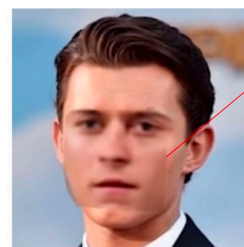
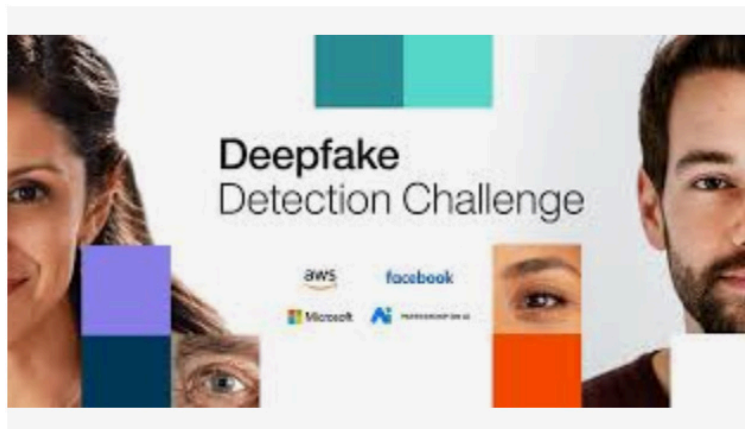
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### Audio:

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### Video:

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**“Spotting Deepfakes is like spotting viruses:  
viruses:  
an ever changing challenge”**

# Solutions: Education

## Education

- Professionals in the newsroom
  - Learn, use, create tools
  - Modify workflows
- Public
  - Trustworthy resources
  - How to distinguish fake/real

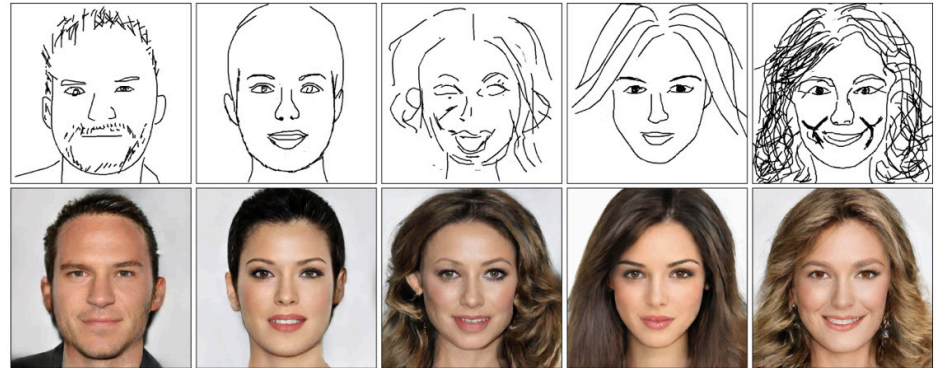
## Collaboration (e.g. in EU level, EBU)

- Trainings
- Catalogue “digital forensics”



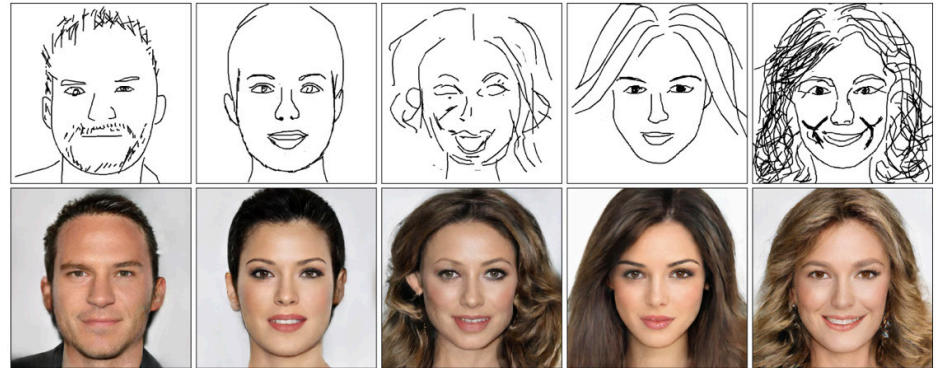
# More applications... or business opportunities!

- generating realistic face images from sketches (Deepface Drawing)



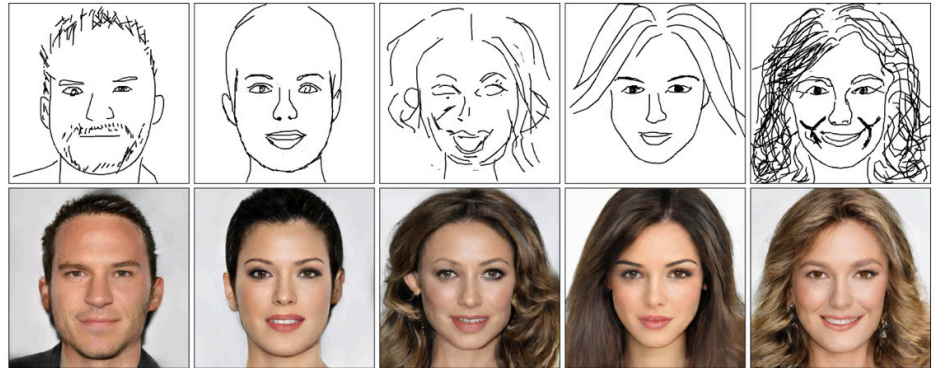
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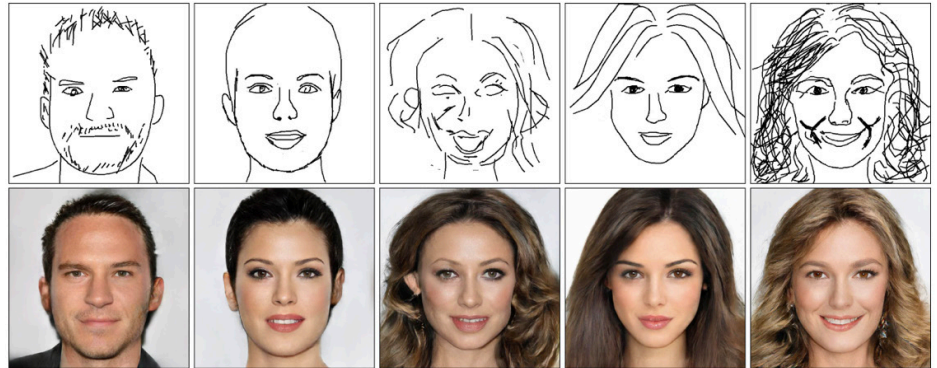
**this bird  
is red with white  
and has a very  
short beak**



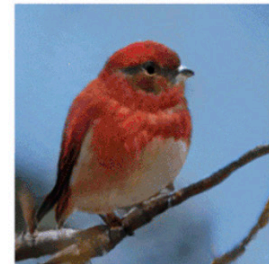


# More applications... or business opportunities!

- generating realistic face images from sketches (Deepface Drawing)
- ..or even from text
- dubbing foreign-language films
- creating personalized synthetic advertising



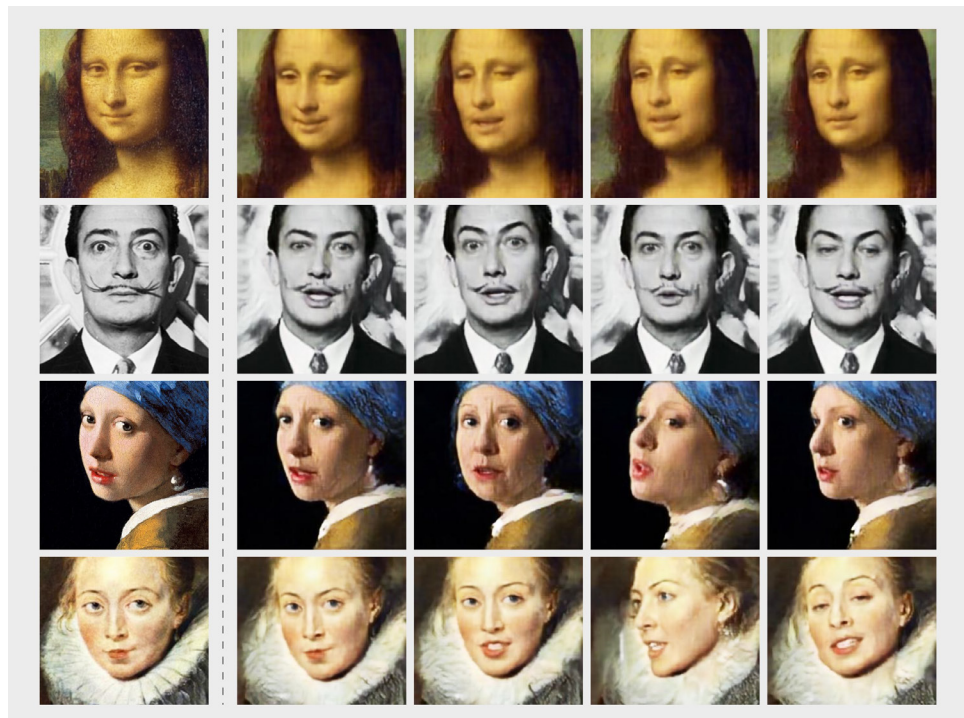
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# More applications... or business opportunities!

- generating realistic face images from sketches  
(Deepface Drawing)
- ..or even from text
- dubbing foreign-language films
- creating personalized synthetic advertising
- creating living portraits of favourite persons for education



Living portraits... or Mona Lisa smiled!  
<https://www.wired.com/story/deepfakes-getting-better-theyre-easy-spot/>

Dalí once said... “If I die, I won’t completely die.”



“Dali Lives,” Dali Museum in St. Petersburg, Florida

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# Open Source INTelligence

Investigative Journalists



OSINT







Data has a better idea

# Investigative journalism – BBC Cameroon atrocity

The screenshot shows the BBC News website interface. At the top, there is a navigation bar with the BBC logo, a sign-in button, and various news categories like News, Sport, Reel, Worklife, Travel, Future, Culture, Music, TV, Weather, and Sounds. Below this is a red 'NEWS' banner with sub-categories: Home, Video, World, UK, Business, Tech, Science, Stories, Entertainment & Arts, Health, World News TV, In Pictures, Reality Check, Newsbeat, and More. Under the 'World' category, there are sub-regions: Africa, Asia, Australia, Europe, Latin America, Middle East, and US & Canada. The main content area features a row of video thumbnails with titles and dates. The selected video is 'Cameroon atrocity: Finding the soldiers who killed this woman', dated 24 Sep 2018. The video player shows a scene of people walking on a dirt road. To the right of the video player, there is a detailed article with a title, a summary paragraph, a longer paragraph, an investigation credit line, a quote about the story's award, and a share button.

**BBC** Sign in News Sport Reel Worklife Travel Future Culture Music TV Weather Sounds Search

**NEWS**

Home Video World UK Business Tech Science Stories Entertainment & Arts Health World News TV In Pictures Reality Check Newsbeat More

World Africa Asia Australia Europe Latin America Middle East US & Canada

**NOW PLAYING** 10:50 **BBC finds truth behind this woman's killing** 24 Sep 18

**UP NEXT** 9:36 **Cameroon's descent towards civil war** 25 Jun 18

7:23 **Inside the world of Kenya's 'killer cop'** 10 Sep 18

4:56 **Torture exposed at Somali rehab clinic** 30 Jul 18

5:19 **'My neighbour is a rapist'** 16 Jul 18

5:32 **African referees filmed taking cash** 07 Jun 18

6:26 **Nigeria's deadly cough syrup epidemic** 30 Apr 18

**Cameroon atrocity: Finding the soldiers who killed this woman**

In July 2018 a horrifying video began to circulate on social media. It shows two women and two young children being led away at gunpoint by a group of Cameroonian soldiers. The captives are blindfolded, forced to the ground, and shot 22 times.

The government of Cameroon initially dismissed the video as "fake news." But BBC Africa Eye, through forensic analysis of the footage, can prove exactly where this happened, when it happened, and who is responsible for the killings.

*Investigation by Aliaume Leroy and Ben Strick. Produced by Daniel Adamson and Aliaume Leroy. Motion Graphics: Tom Flannery*

*This story won an RTS award in February 2019. The judges said it was "a superb piece of public interest journalism which held power to account and had a huge impact in social media."*

24 Sep 2018

f Share

<https://www.bbc.com/news/av/world-africa-45599973/cameroon-atrocity-finding-the-soldiers-who-killed-this-woman>



# Investigative journalism – BBC Cameroon atrocity

## Where?

Topography match: mountain ranges  
Tracks/roads, buildings, trees



## When?

Shadow analysis  
Historical satellite data



## Who?

Identify objects: gun models, soldier uniforms  
Analyze background sounds and voices



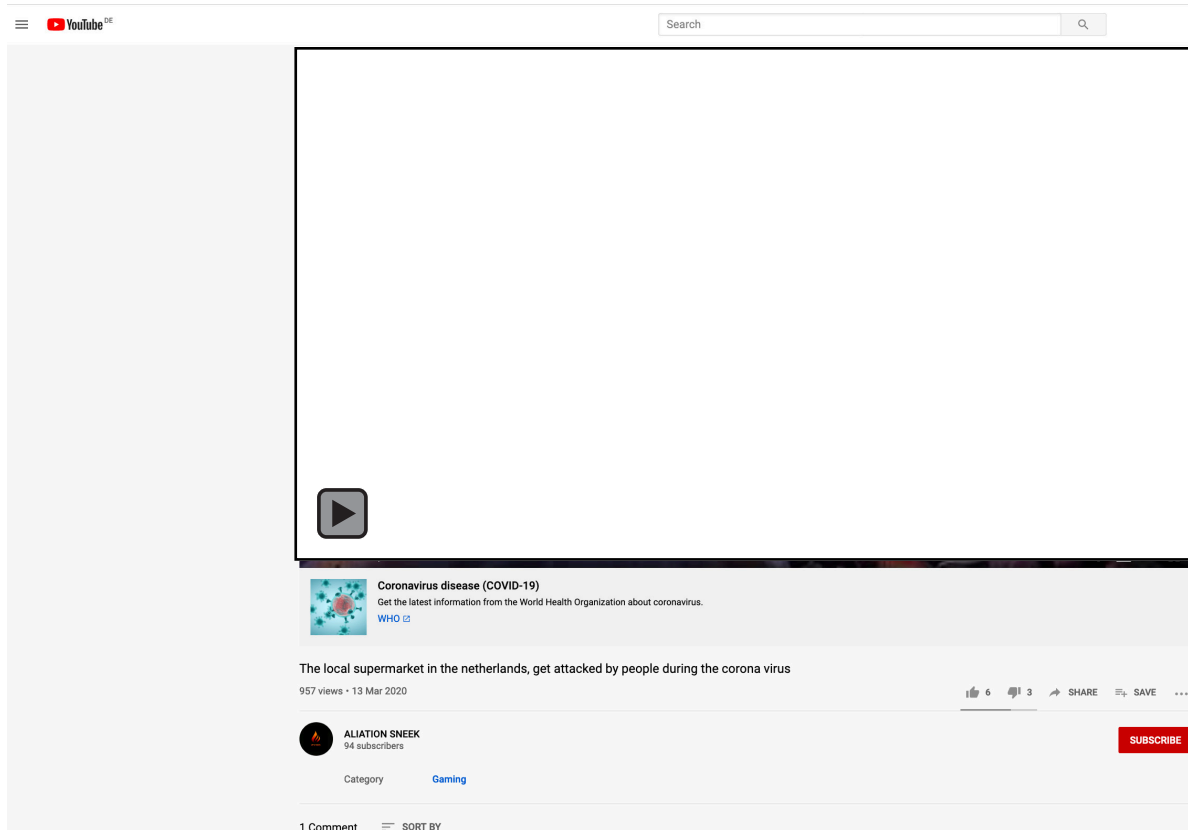
uniforms used to  
addition, and st  
equipment of th  
heavy helmets,  
the video;

The weapons di  
are not those us

One of the men,  
indicating his re  
conformity with

As you can see.

# COVID-19 Panic: The “Haarlem ALDI” by Bellingcat



The image is a screenshot of a YouTube video player. The video title is "The local supermarket in the netherlands, get attacked by people during the corona virus". The video has 957 views and was uploaded on 13 Mar 2020. The channel is "ALIAION SNEEK" with 94 subscribers, categorized under "Gaming". The video description includes a link to WHO information about coronavirus. The video player shows a play button in the bottom left corner of the video frame.

YouTube

Search

Coronavirus disease (COVID-19)  
Get the latest information from the World Health Organization about coronavirus.  
[WHO](#)

The local supermarket in the netherlands, get attacked by people during the corona virus  
957 views · 13 Mar 2020

6 3 SHARE SAVE ...

ALIAION SNEEK  
94 subscribers  
Category: [Gaming](#) [SUBSCRIBE](#)

1 Comment SORT BY

<https://www.bellingcat.com/news/2020/03/13/monitoring-and-debunking-covid-19-panic-the-haarlem-aldi-hoax/>

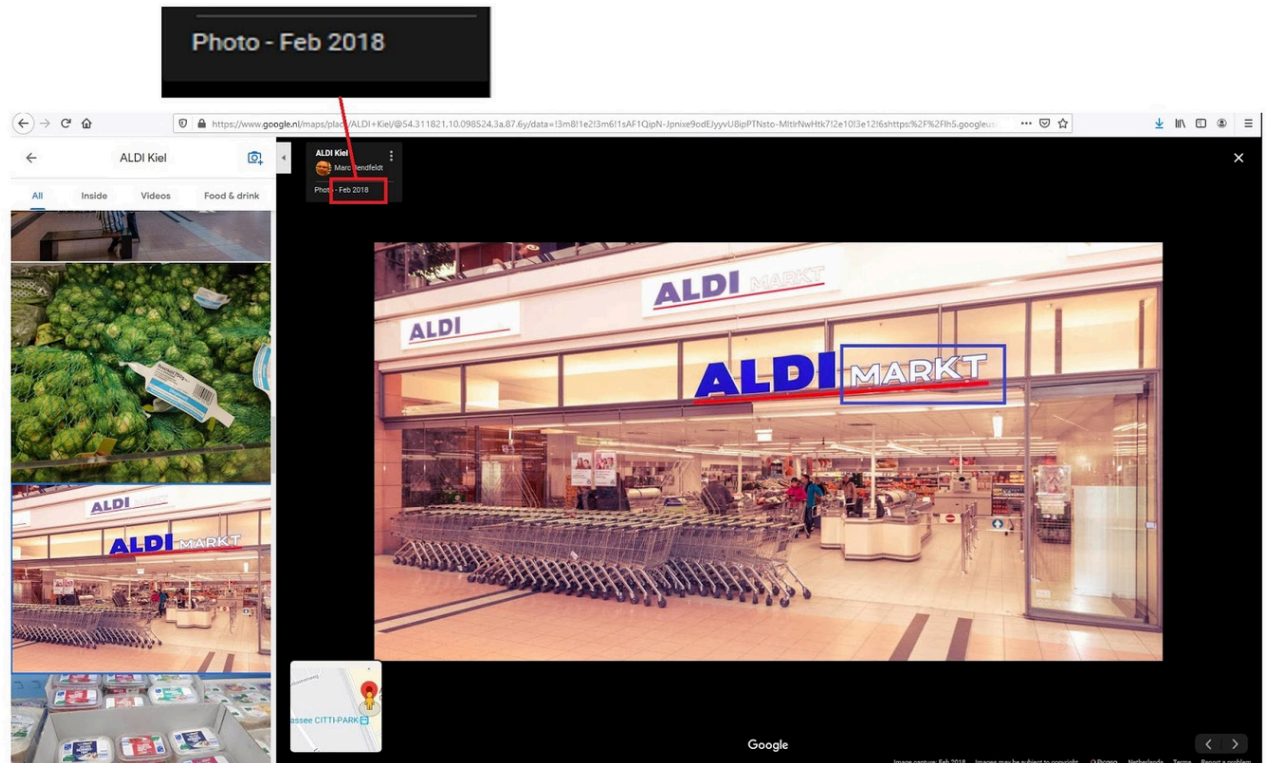
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## 1. Sings in German NOT in dutch



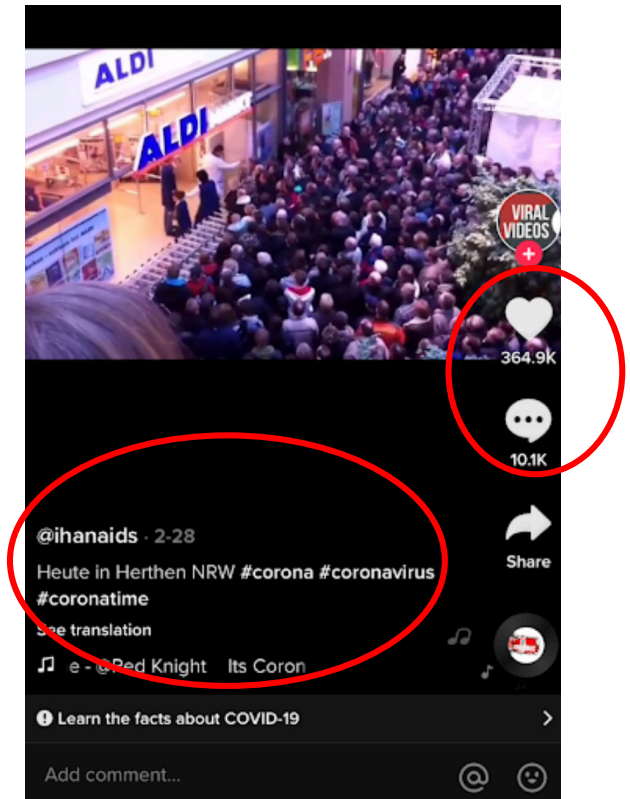
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2. Track back: logo not up-to-date



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3. Track in social media: twitter, facebook and TikTok (@Herthen) <- viral





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1. Sings in German NOT in dutch
2. Track back: logo not up-to-date
3. Track in social media: twitter, facebook and TikTok (@Herthen) <- viral
4. Find original video: Kiel 2011!





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# Outlook

- AI changes media (both opportunities & risks)
- Synthesized media: Deepfakes - a major threat
- Technology: changes the way journalists work – trustworthy reporting
- Fight misinformation



On the way out.. 😊



# Thank you for your attention!

Experts in audio-visual media



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