

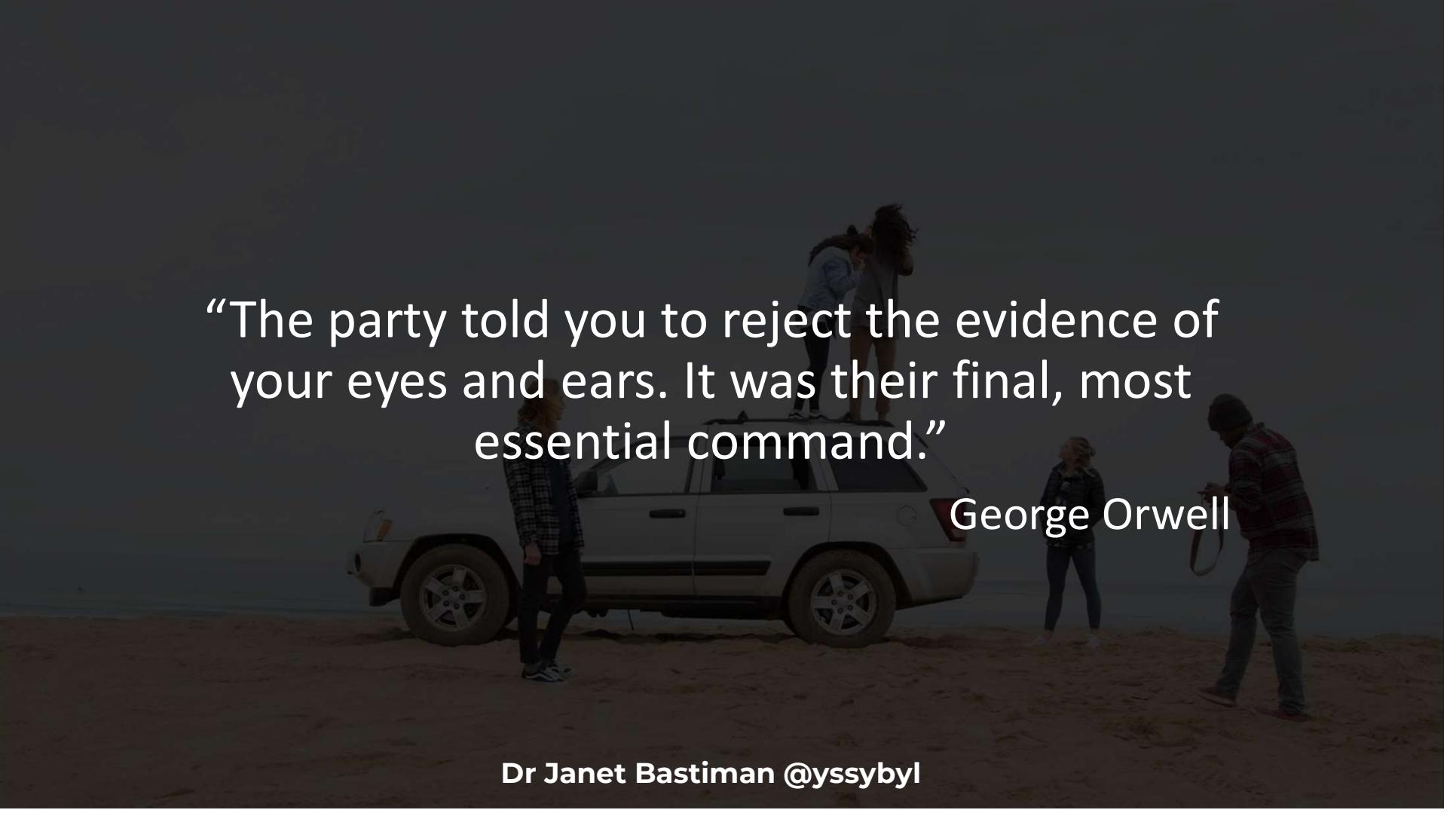


Reject the evidence of your eyes and ears

Deepfakes and Orwellian Post-Truth



Dr Janet Bastiman @yssybyl

A dark, atmospheric photograph of a group of people on a beach at dusk or night. A white SUV is parked on the sand. Several people are standing around it: one person is leaning against the rear door, another is standing behind the vehicle, and two others are further back, one holding a long object. The scene is dimly lit, with the subjects appearing as dark silhouettes against the lighter sky.

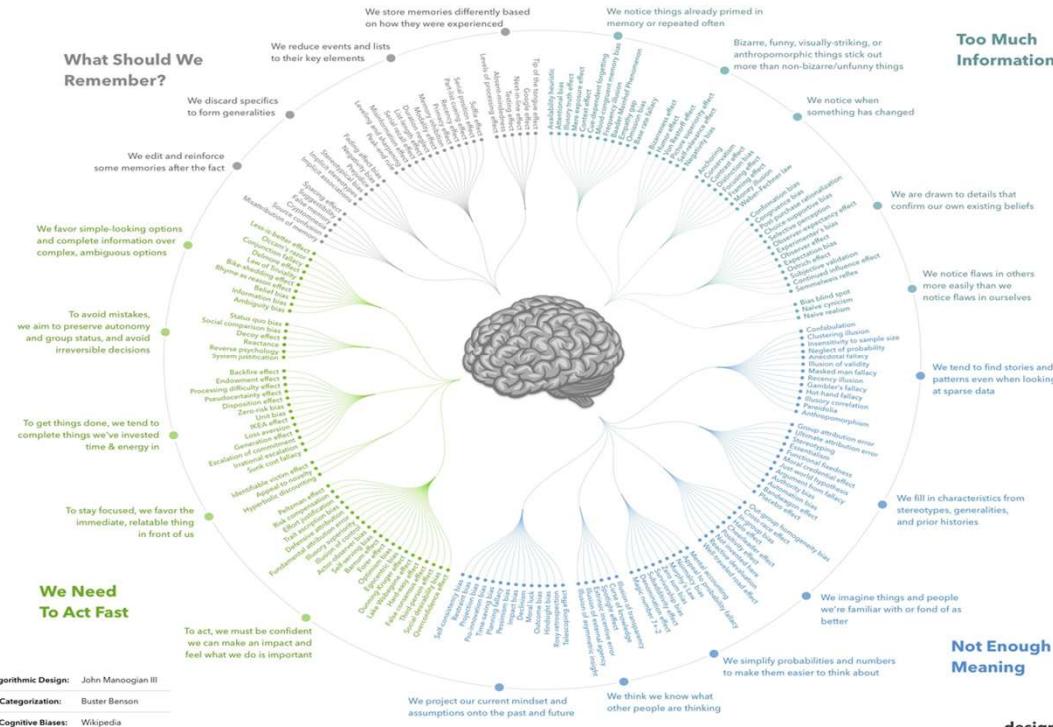
“The party told you to reject the evidence of
your eyes and ears. It was their final, most
essential command.”

George Orwell

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COGNITIVE BIAS CODEX



<https://www.designhacks.co/products/cognitive-bias-codex-poster>

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Fake News?



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INTERNATIONAL COOPERATION AND DEVELOPMENT

Building partnerships for change in developing countries

European Commission > International Cooperation and Development > Regions > African, Caribbean and Pacific (ACP) region > ACP - Main funding programmes

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REGION

- Africa
 - African, Caribbean and Pacific (ACP) region
 - ACP - multi-country cooperation
 - Main funding programmes**
 - Microfinance
 - Asia
 - Central Asia
 - Latin America
 - Overseas Countries and Territories (OCTs)
 - Sub-Saharan Africa
 - The Caribbean
 - The Gulf
 - The Pacific
 - The Cotonou Agreement

ACP - Main funding programmes

By tackling poverty, boosting local economies and strengthening governance, the EU supports millions of people in African, Caribbean and Pacific countries. The EU provides development assistance to secure the long-term future of developing countries which face the rigours of operating in an ever more complex and fast-paced global economy.

The Commission finances most of its development programmes for African, Caribbean and Pacific (ACP) partner countries through the European Development Fund (EDF). Money from this pot is also spent on supporting the EU's Overseas Countries and Territories (OCTs). ACP countries also benefit from substantial financing under the EU budget. Member States contribute to both the EDF and the general budget.

Commission funding for overseas aid is significant. The total financial resources of the 11th EDF amount to €30.5 billion for the period 2014-2020. The budget for the EU budget for 2014-2020 amounts to €12.5 billion. The EU will give out payments of €22.7 billion. Between 2003 and 2007, the ninth EDF provided €13.5 billion to ACP countries, in addition to € 9.9 billion from the previous programming period. For an overview of EDF and Budget financing, see the [Annual Reports of the European Community's Development and External Assistance Policies and their Implementation](#).

The EU must make best use of European taxpayers' money by ensuring that援助 programmes are tailor-made to meet local needs, and that they deliver concrete, lasting results. In line with the Agenda for Change, funding is flexible and given where it is needed most. Furthermore, the EU's Millennium Development Goal initiative supports 'good performers' to reach the Millennium Development Goals (MDGs) and provides additional funding on a case-by-case basis to accelerate progress towards the most off-track MDGs.

The Commission funds most ACP aid programmes in **four stages**. Firstly, multi-year contracts are signed between the EU and countries. After this, financing decisions are taken to allocate money to specific projects. Thirdly, contracts are prepared and signed at project level to start implementation. Finally, payments are made to the contractors for delivery.

NEWS & EVENTS

New ACP-EU Partnership: Chief negotiators assess progress made and move talks on to next stage
23 May 2019

New ACP-EU Partnership: Chief negotiators conclude successful series of regional consultations, culminating with African leaders' meeting
3 May 2019

[View more](#)

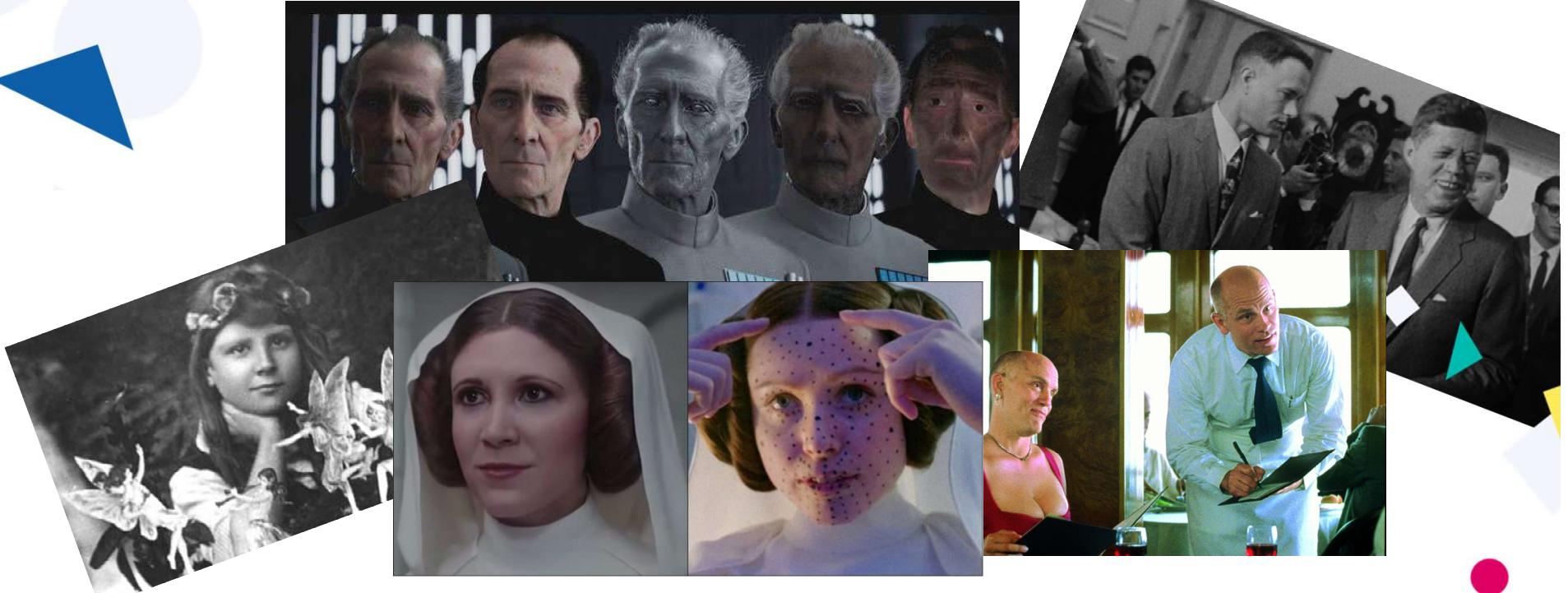
How the EU starves Africa into submission

By Calestous Juma | @calestous



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Fakes have been around a long time



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Things to check out

Allan Xia @AllanXia · Aug 31
In case you haven't heard, #ZAO is a Chinese app which completely blew up since Friday. Best application of 'Deepfake'-style AI facial replacement I've ever seen.

Here's an example of me as DiCaprio (generated in under 8 secs from that one photo in the thumbnail) 😊

630 14K 29K

Allan Xia @AllanXia · Aug 31
It's already under a lot of fire for user privacy protection under their terms and conditions. So consider this my sacrifice to demonstrate so you don't have to give up your portrait identity rights 😊

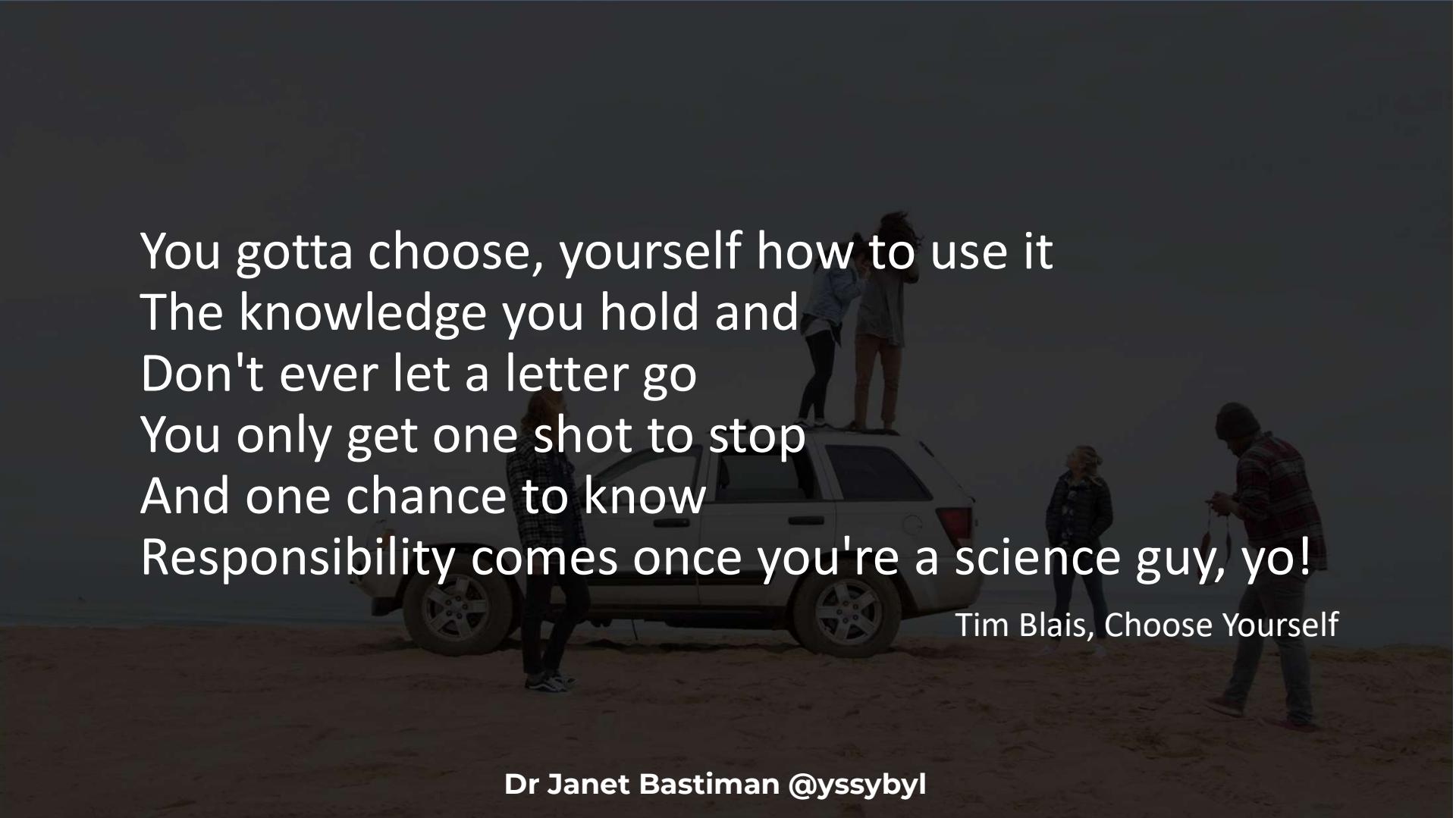
7 209 1.6K

Rogue Rocket deep dive on deepfakes:
https://youtu.be/_YSKEUxDaeM

Bill Hader channelling Tom Cruise:
<https://youtu.be/VWrhRBb-1lg>

Stallone in Terminator 2:
<https://youtu.be/AQvCmQFScMA>

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A photograph of a group of people on a sandy beach. In the center, a white SUV is parked. Two people are standing on its roof. To the left, a person is leaning against the front door. To the right, two more people are standing; one is looking down at something in their hands. The sky is dark, suggesting it's either nighttime or the photo was taken during twilight.

You gotta choose, yourself how to use it
The knowledge you hold and
Don't ever let a letter go
You only get one shot to stop
And one chance to know
Responsibility comes once you're a science guy, yo!

Tim Blais, Choose Yourself

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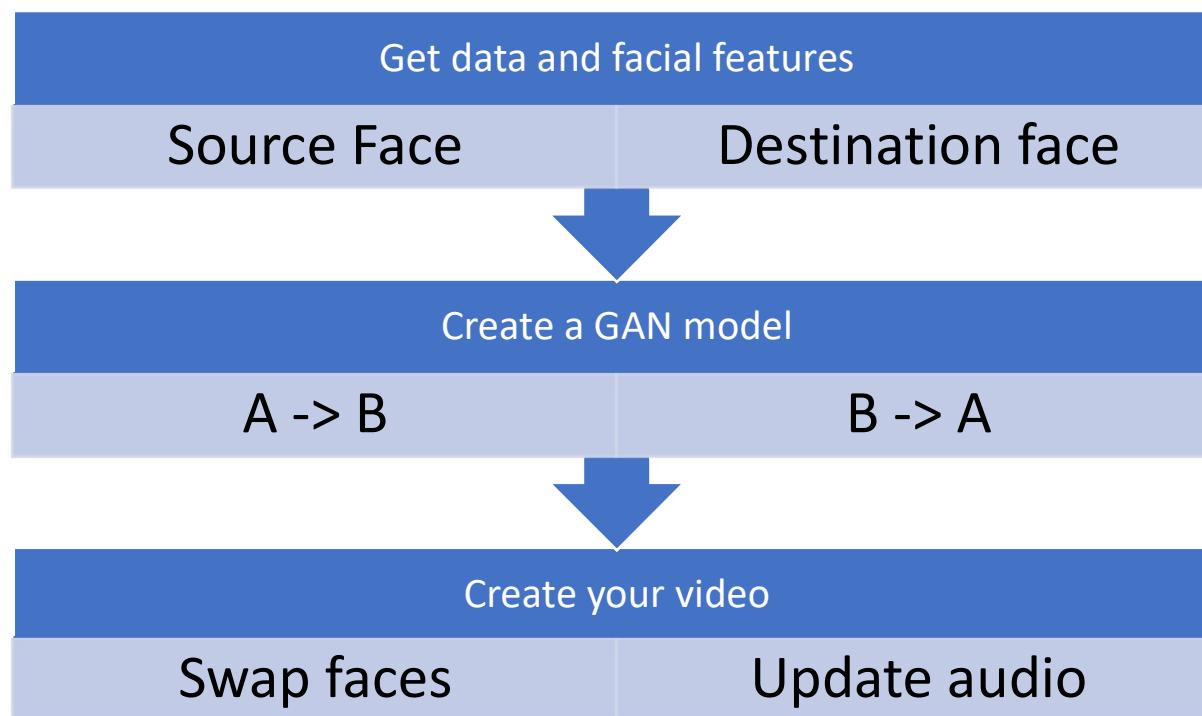


AI for Good

- it is not for creating inappropriate content.
- it is not for changing faces without consent or with the intent of hiding its use.
- it is not for any illicit, unethical, or questionable purposes.
- it exists to experiment and discover AI techniques, for social or political commentary, for movies, and for any number of ethical and reasonable uses.

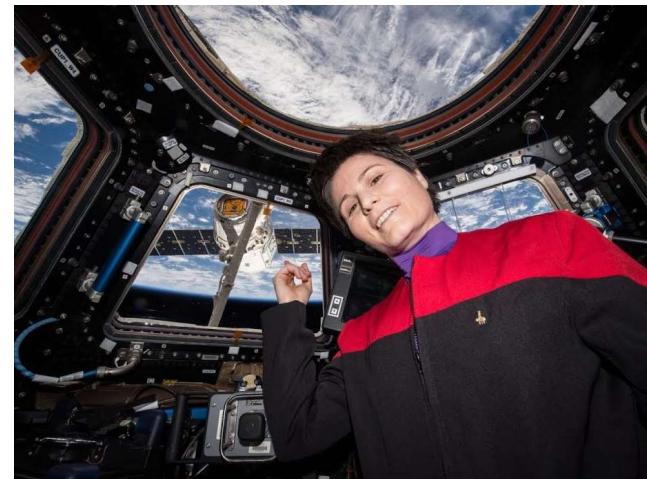
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How to create a deep fake



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Captain Samantha Christoforetti



Images from ESA and Samantha Christoforetti

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Software

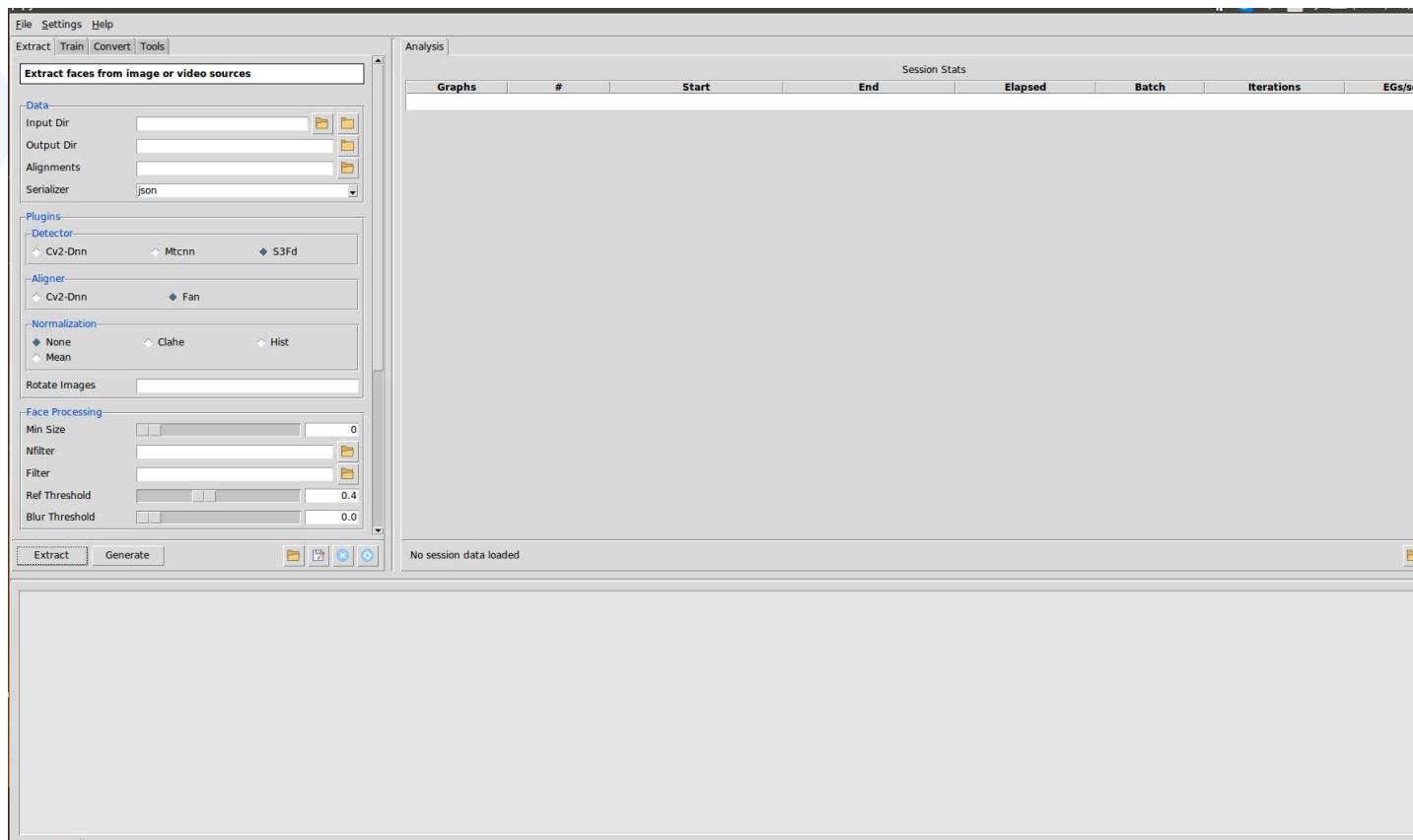
Ubuntu 16.04	https://www.ubuntu.com/download
Git	<code>apt-get install git-core</code>
Docker	https://docs.docker.com/install/linux/docker-ce/ubuntu/
Nvidia-Docker	https://gist.github.com/dsdenes/d9c66361df96bce3fca8f1414bb14bce
Faceswap	https://github.com/deepfakes/faceswap
Google image scrape	https://github.com/hardikvasa/google-images-download (for example)
Audacity	https://audacityguide.com/audacity-for-linux
Shotcut	https://highlytechno.com/how-to-install-shotcut-in-ubuntu-or-linux/



Setup



Hands on: 5 min
Processing: 10 min



Source data gather – Face A



Hands on: 35 min
Processing: 10 min



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Source data gather – face B



Hands on: 40 min
Processing: 10 min

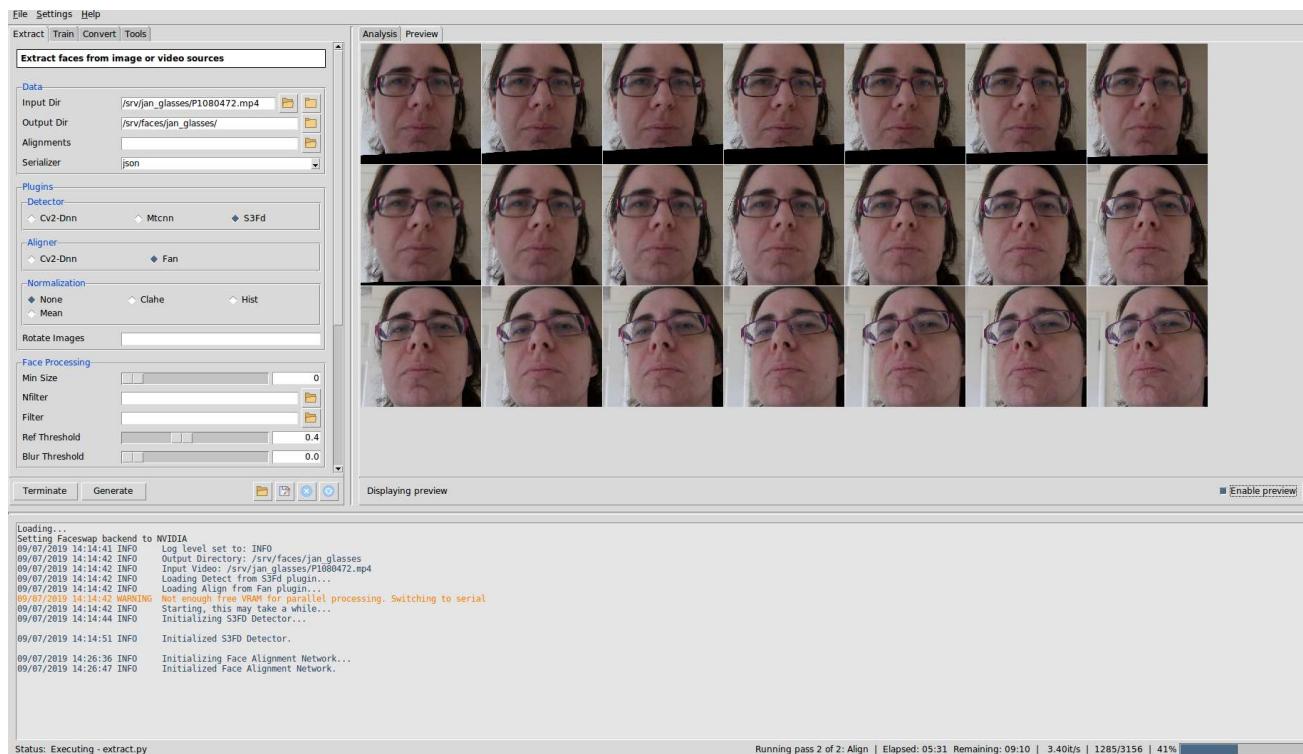


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Data Processing



Hands on: 40 min
Processing: 20 min



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VGG faces

Example correct classification: positive pairs



Example correct classification: negative pairs



Example incorrect classification



False negative

False positive

- “Very Deep” Architecture

- Different from previous architectures proposed for face recognition:
 - locally connected layers (Facebook)
 - inception (Google)

- Learning a multi-way classifier

- Soft Max Objective
- 2622 way classification
- 4096d descriptor

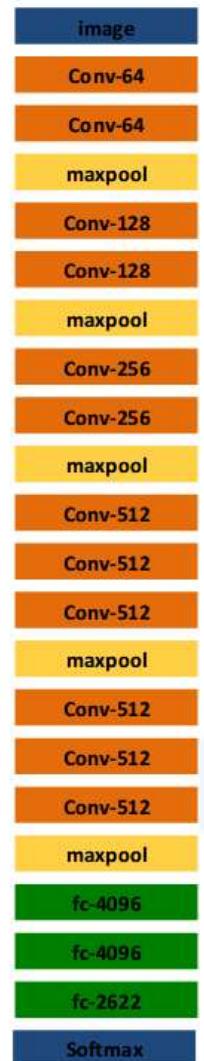
- Learning Task Specific Embedding

- The embedding is learnt by minimizing the triplet loss

$$\sum_{(a,p,n) \in T} \max\{0, \alpha - \|\mathbf{x}_a - \mathbf{x}_n\|_2^2 + \|\mathbf{x}_a - \mathbf{x}_p\|_2^2\}$$

- Learning a projection layer from 4096 to 1024 dimensions
- Online triplet formation at the beginning of each iteration
- Fine tuned on target datasets

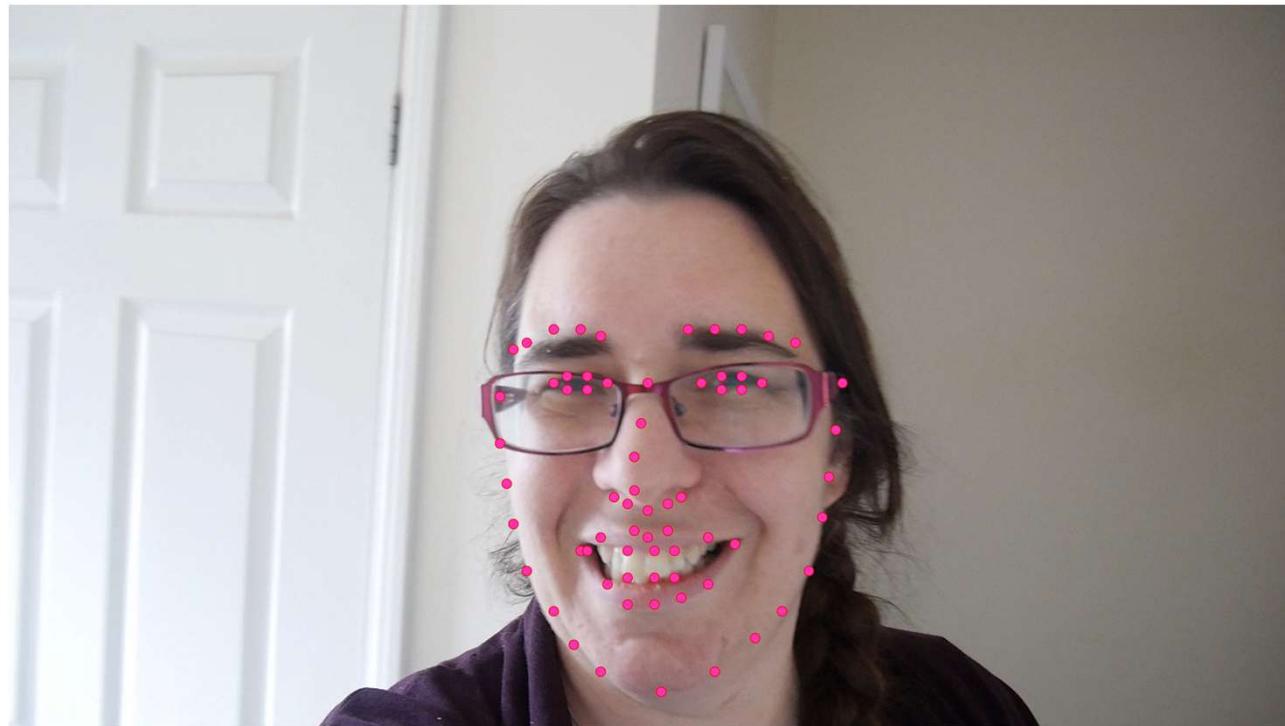
<https://www.robots.ox.ac.uk/~vgg/publications/2015/Parkhi15/parkhi15.pdf>



Data Extract Example



Hands on: 40 min
Processing: 20 min

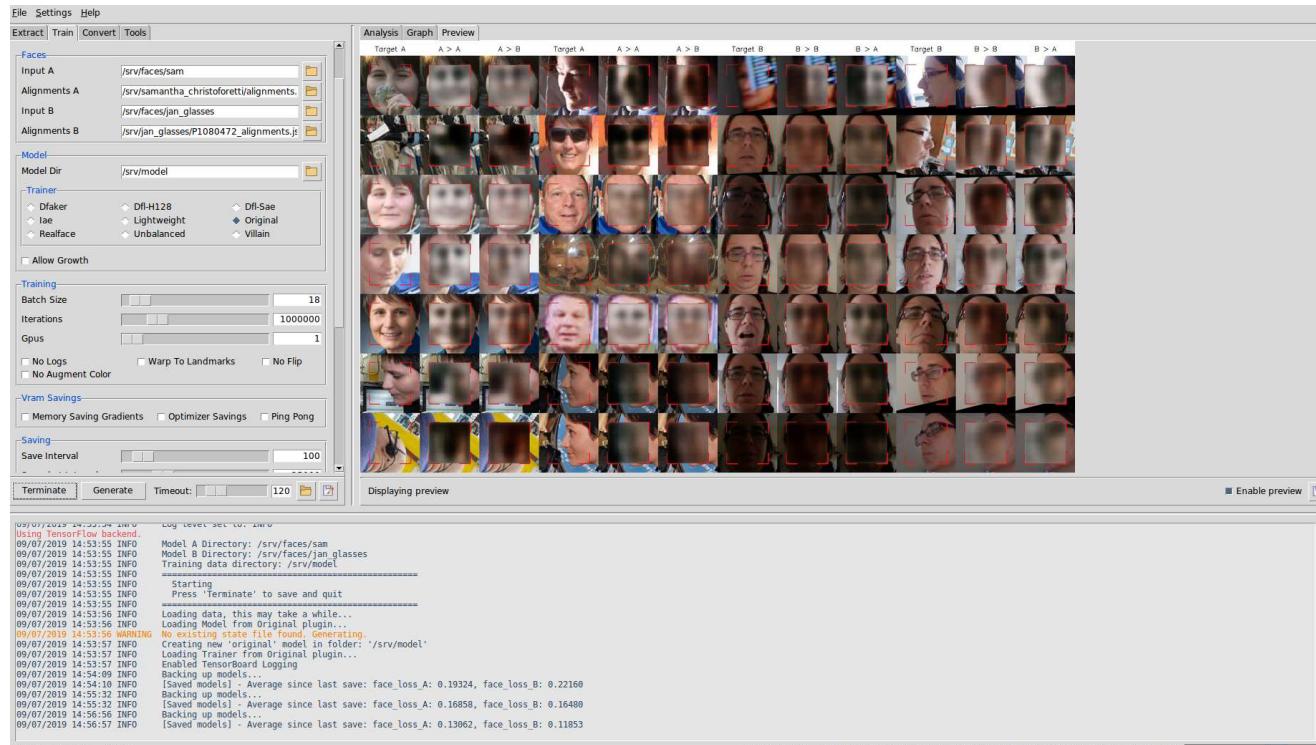


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Converting

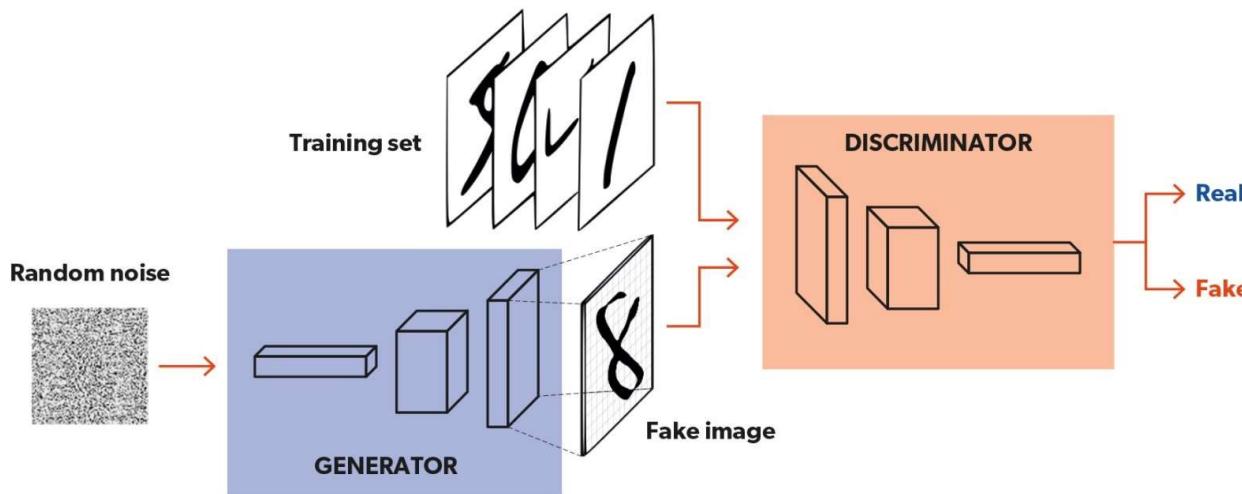


Hands on: 50 min
Processing: 30 min



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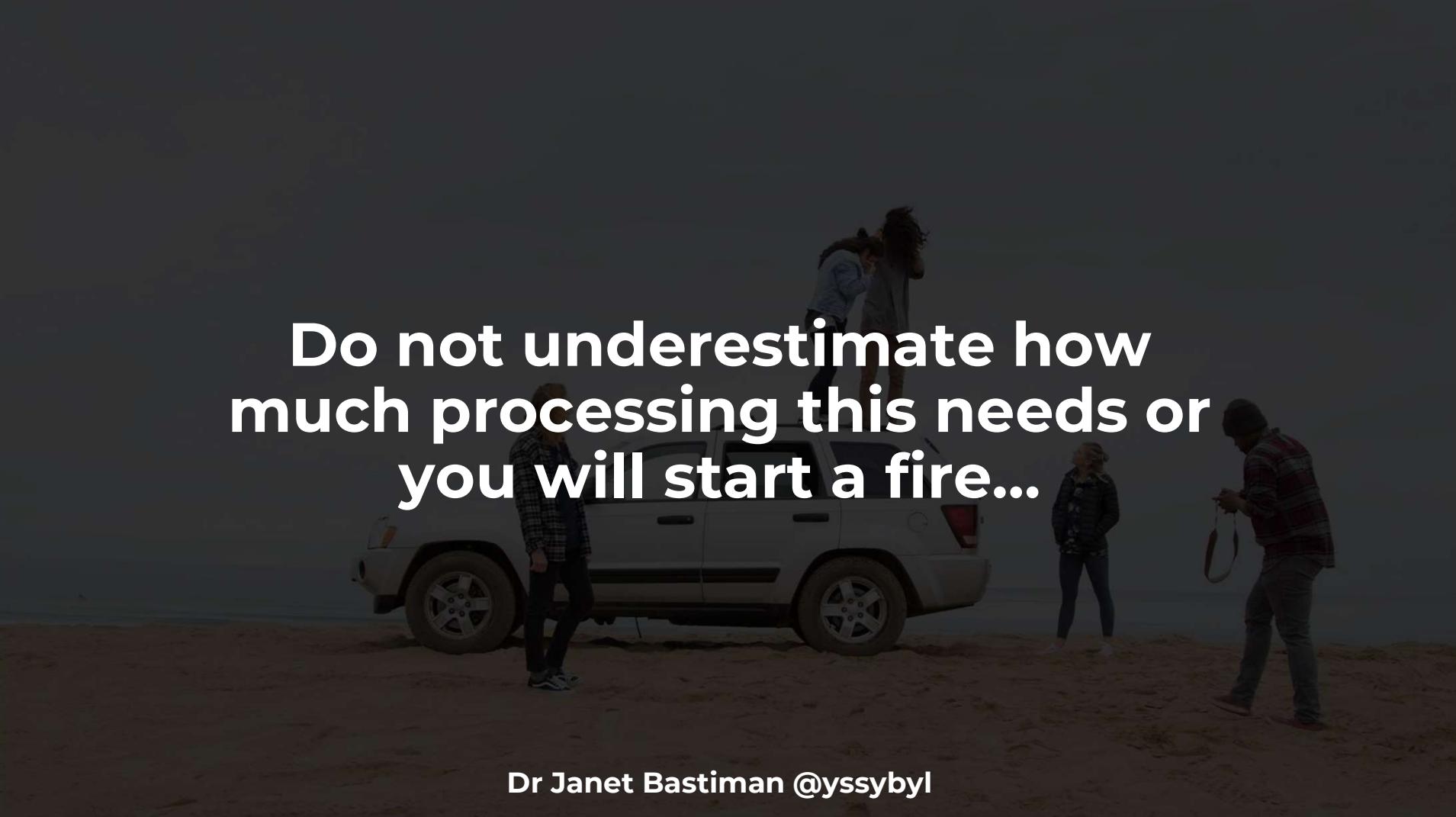
Generative Adversarial Networks



Source: Thalles Silva (<https://bit.ly/2MZGKAs>)

<https://blog.paperspace.com/implementing-gans-in-tensorflow/>

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A dark, grainy photograph of a group of people on a beach at night. A white SUV is parked on the sand. One person is leaning against the rear of the vehicle. Another person is standing to the left, looking towards the vehicle. In the background, two more people are standing further away, one appearing to take a photo with a camera. The scene is dimly lit, with the subjects mostly silhouetted against the dark sky.

**Do not underestimate how
much processing this needs or
you will start a fire...**

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Training End



Hands on: 65 min
Processing: 22.5 hrs

The screenshot shows the Faceswap software interface during the 'Train' phase. On the left, the 'Train' tab is active, displaying configuration options for 'Input A' (sam), 'Alignments A' (samantha_christoforetti/alignments), 'Input B' (jan_glasses), and 'Alignments B' (jan_glasses/P1080472_alignments.js). The 'Model Dir' is set to /srv/model. Under 'Trainer', various models are listed: Dfaker, Df-H128, Df-Sae, Iae, Lightweight, Original, Realface, Unbalanced, and Villain. The 'Allow Growth' checkbox is unchecked. In the 'Training' section, 'Batch Size' is 20, 'Iterations' is 100000, and 'Gpus' is 1. Log checkboxes include 'No Logs', 'Warp To Landmarks', 'No Flip', 'No Augment Color', 'Memory Saving Gradients', 'Optimizer Savings', and 'Ping Pong'. The 'Vram Savings' and 'Saving' sections show 'Save Interval' at 100 and 'Snapshot Interval' at 25000. At the bottom, a terminal window displays the command-line logs of the training process:

```
Loading...
Setting Faceswap backend to NVIDIA
Level set to: INFO
Using TensorFlow backend.
09/09/2019 10:15:39 INFO Model A Directory: /srv/faces/sam
09/09/2019 10:15:40 INFO Model B Directory: /srv/faces/jan_glasses
09/09/2019 10:15:40 INFO Training data directory: /srv/model
=====
09/09/2019 10:15:40 INFO Starting...
09/09/2019 10:15:40 INFO Press 'Terminate' to save and quit
09/09/2019 10:15:41 INFO Loading data, this may take a while...
09/09/2019 10:15:41 INFO Loading Model from Original plugin
09/09/2019 10:15:41 INFO Using Configuration saved in state file
09/09/2019 10:15:41 WARNING Support for multiple model types within the same folder has been deprecated and will be removed from a future update. Please split each model into separate folders to avoid issues in future.
09/09/2019 10:15:41 INFO Loading Trainer from Original plugin...
09/09/2019 10:15:43 INFO Enabled Tensorboard Logging
09/09/2019 10:15:44 INFO [Saved models] - Average since last save: face_loss_A: 0.03370, face_loss_B: 0.03204
```

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Finding a video



Hands on: 80 min
Processing: 22.5 hrs



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Converted video



Hands on: 1.5 hrs
Processing: 22.6 hrs

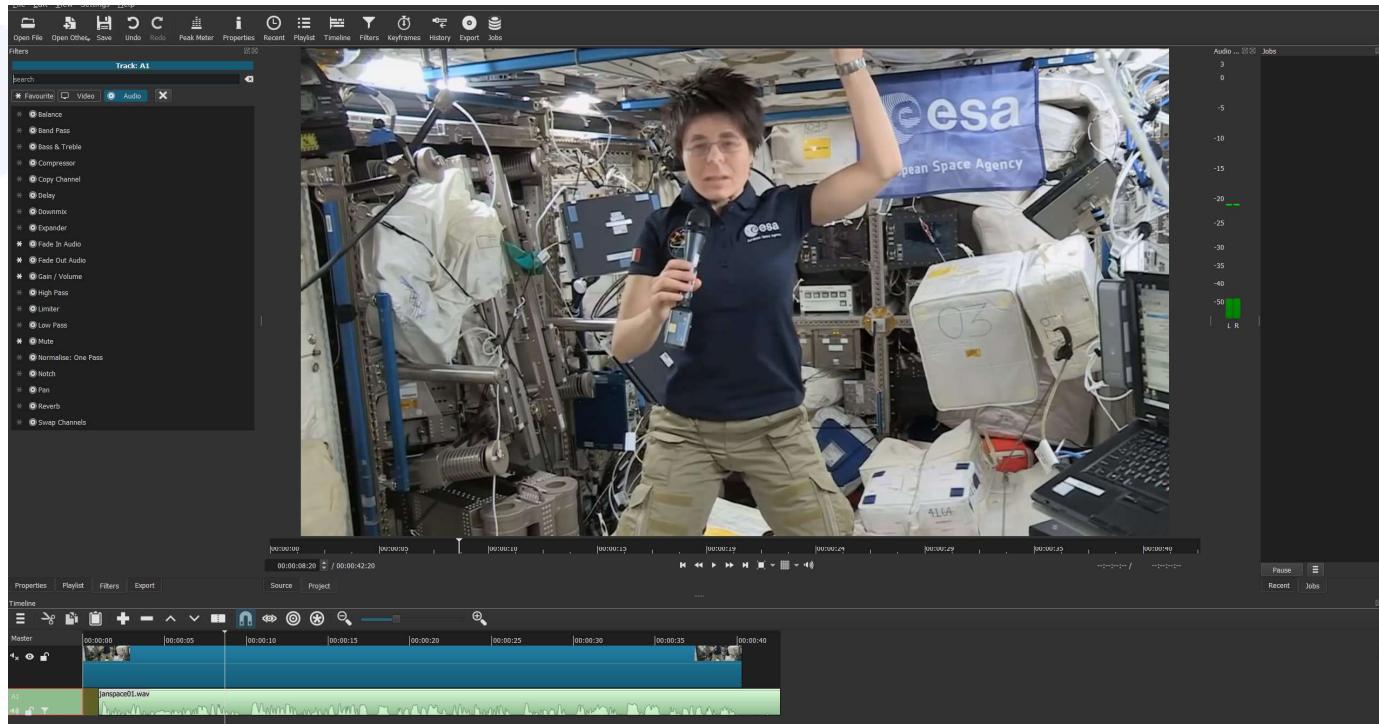


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Audio editing (basic)



Hands on: 1.75 hrs
Processing: 22.6 hrs



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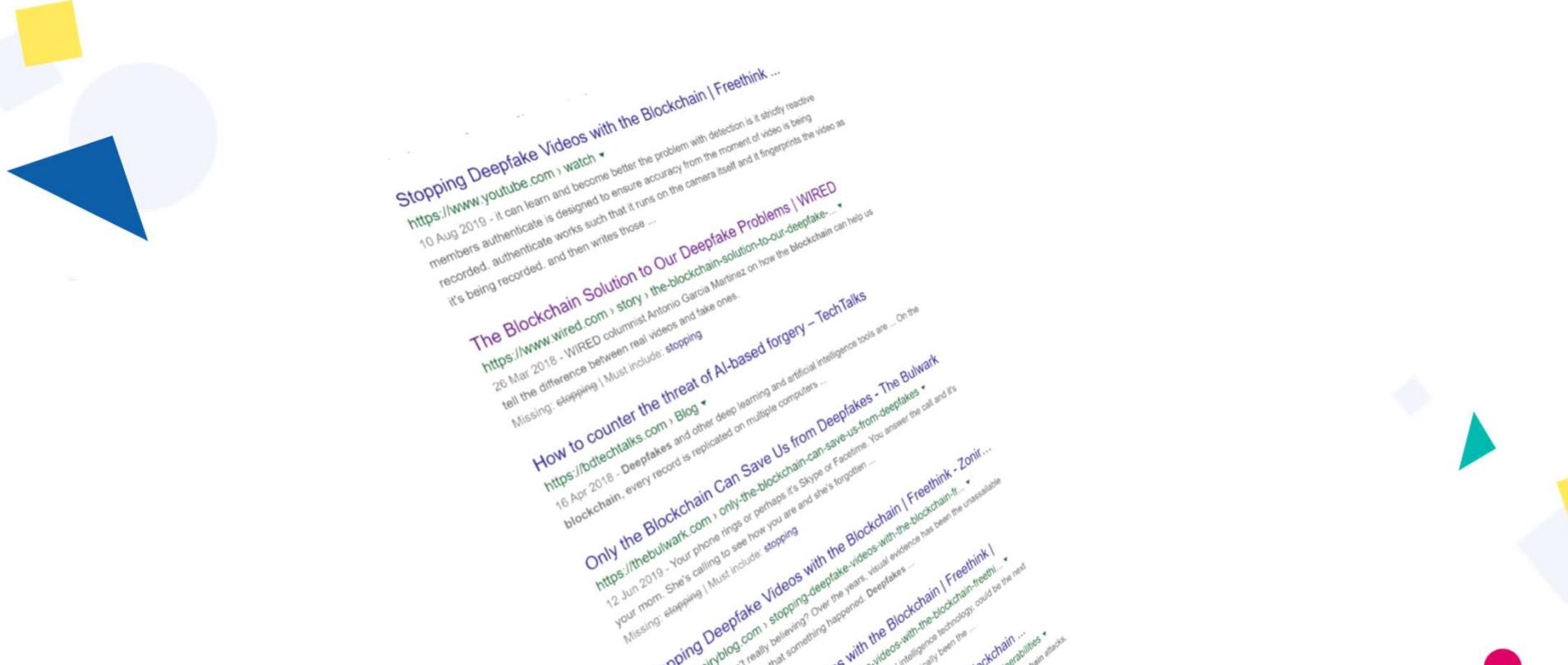
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Back to the dystopia...

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Verification

- 
- Stopping Deepfake Videos with the Blockchain | Freethink ...**
<https://www.youtube.com/watch?v=10Aug2019> - It can learn and become better the problem with detection is it's strictly reactive members authenticate is designed to ensure accuracy from the moment of video is being recorded. authenticates works such that it runs on the camera itself and it fingerprints the video as it's being recorded, and then writes those ...
 - The Blockchain Solution to Our Deepfake Problems | WIRED**
<https://www.wired.com/story/the-blockchain-solution-to-our-deepfake/>
26 Mar 2018 - WIRED columnist Antonio Garcia Martinez on how the blockchain can help us tell the difference between real videos and fake ones.
Missing: stopping | Must include: stopping
 - How to counter the threat of AI-based forgery – TechTalks**
<https://bttechtalks.com/Blog>
16 Apr 2018 - Deepfakes and other deep learning and artificial intelligence tools are ... On the blockchain, every record is replicated on multiple computers ...
Missing: stopping | Must include: stopping
 - Only the Blockchain Can Save Us from Deepfakes - The Bulwark**
<https://thebulwark.com/only-the-blockchain-can-save-us-from-deepfakes>
12 Jun 2019 - Your phone rings or perhaps it's Skype or Facetime. You answer the call and it's your mom. She's calling to see how you are and she's forgotten ...
Missing: stopping | Must include: stopping
 - Stopping Deepfake Videos with the Blockchain | Freethink - Zonir...**
<https://zoniryblog.com/stopping-deepfake-videos-with-the-blockchain-f...>
What if seeing isn't really believing? Over the years, visual evidence has been the unassailable gold standard to prove that something happened. Deepfakes ...
 - Stopping Deepfake Videos with the Blockchain | Freethink |**
<http://richcnx.com/stopping-deepfake-videos-with-the-blockchain-freeth...>
... fake videos generated using artificial intelligence technology could be the next big thing. While news video has historically been the ...
... into stopping 'deep fakes' blockchain ...
... information. While news video has historically been the ...
... 09252018-deep-fakes-blockchain-vulnerabilities ...
... insight into stopping deep fakes: blockchain attacks ...
... scope?

Blink test

<https://arxiv.org/abs/1806.02877>

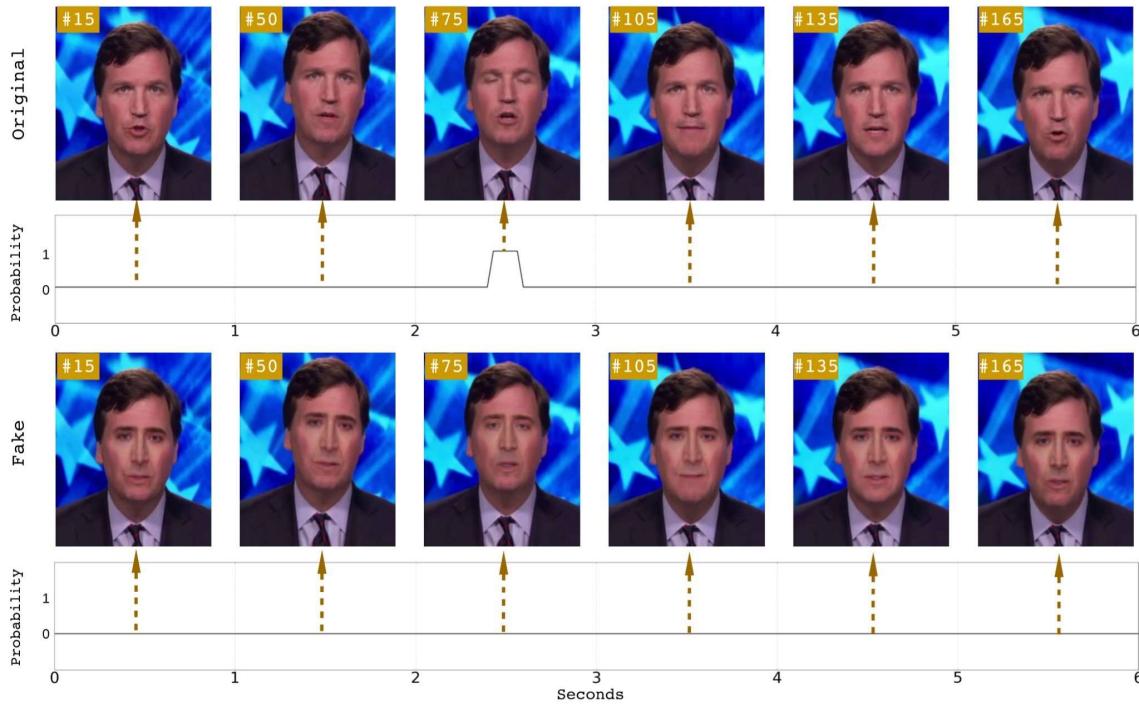
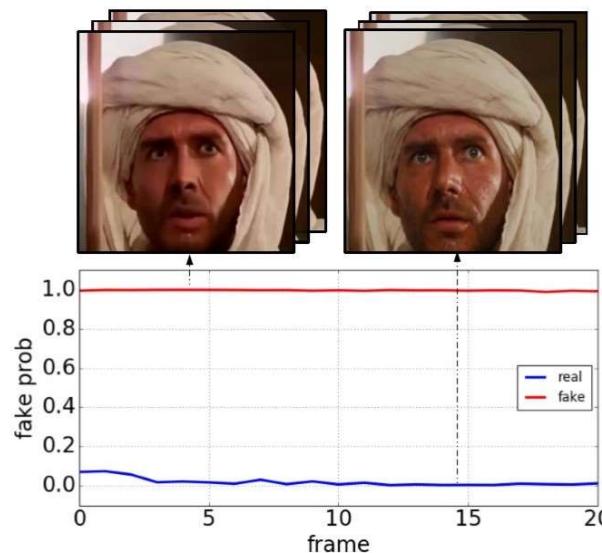


Fig. 1. Example of eye blinking detection on an original video (top) and a DeepFake generated fake video (bottom). Note that in the former, an eye blinking can be detected within 6 seconds, while in the latter such is not the case, which is abnormal from the physiological point of view.

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Looking for discrepancies - <https://arxiv.org/abs/1811.00656>



See also:
<https://arxiv.org/abs/1811.00661>

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Prevention - <https://arxiv.org/abs/1906.09288>

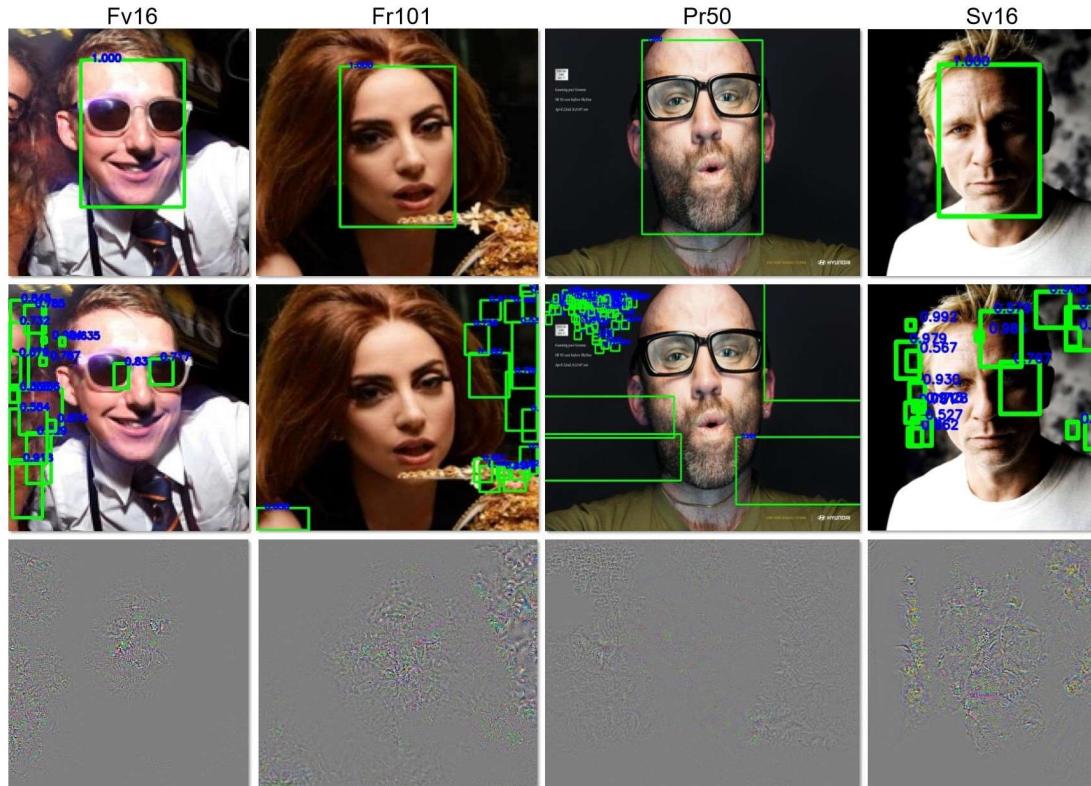


Fig. 3. Visual examples of our method attacking Fv16, Fr101, Pr50 and Sv16 respectively. The top row corresponds to detection results on original images. The middle row corresponds to the detection results on images after adversarial perturbation are added to the original image. The bottom row show the actual noise added, which are amplified by 30 for better visualization.

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A dark, low-light photograph of a group of people on a beach. A white SUV is parked on the sand. One person stands by the rear left tire, another is leaning against the back of the vehicle, and two others are standing further back. A person on the right is holding a camera and looking at it. The scene is dimly lit, with the subjects appearing as dark silhouettes against the lighter sky.

**Are you ready to tell the
difference?**

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