

S.U.R.E. SKILL SERIES: DETECTING FAKE VIDEOS AND IMAGES

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LEARNING OBJECTIVES

- 1) Introduction to S.U.R.E. Skill Series
- 2) What are considered fake images/videos?
- 3) Case studies of the impact of fake images/videos
- 4) Understanding deepfakes
- 5) How to detect AI-generated Images
- 6) How to reverse image-search

1) INTRODUCTION TO S.U.R.E. SKILL SERIES

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The S.U.R.E. Skill Series workshop aims to equip participants with in-depth knowledge of misinformation and fake news, and the means to take action against them to cultivate healthy information discernment habits.

This workshop is the first of three in the S.U.R.E. Skill Series Workshops:

- Part 1: Detecting Fake Videos and Images (2 July 2021)
- Part 2: Safeguarding Your Mind Against Fake News (3 September 2021)
- Part 3: Be a Smart Factchecker (3 December 2021)

WHAT IS S.U.R.E.?



<https://youtu.be/JNFnPqTTPlc>

2) WHAT ARE CONSIDERED FAKE IMAGES/VIDEOS?

1) WHAT ARE CONSIDERED FAKE IMAGES/VIDEOS?

- When a photo or video is deliberately staged or manipulated to give the impression that it is real
- Technological advancements have made it easier to create fake images and videos from scratch, or doctor and manipulate real ones (e.g. photo filter apps)



Loch Ness 'monster' hoax photo (1934)



Deepfake technology to imitate Tom Cruise (2021)

1) WHAT ARE CONSIDERED FAKE IMAGES/VIDEOS?

- Increase in access to photo apps have made it easier for anyone to create fake images/videos
- It is important to keep in mind the **intent** of creating these manipulated content
 - Creating for fun?
 - Creating to stir online hate?



Collage of AI-generated faces
(Source: 123rf.com)

1) WHAT ARE CONSIDERED FAKE IMAGES/VIDEOS?

- Fake news creators can also alter or omit information of an image or video to fool readers
- These cases are spread quickly on social media and messaging apps, as they use authentic images

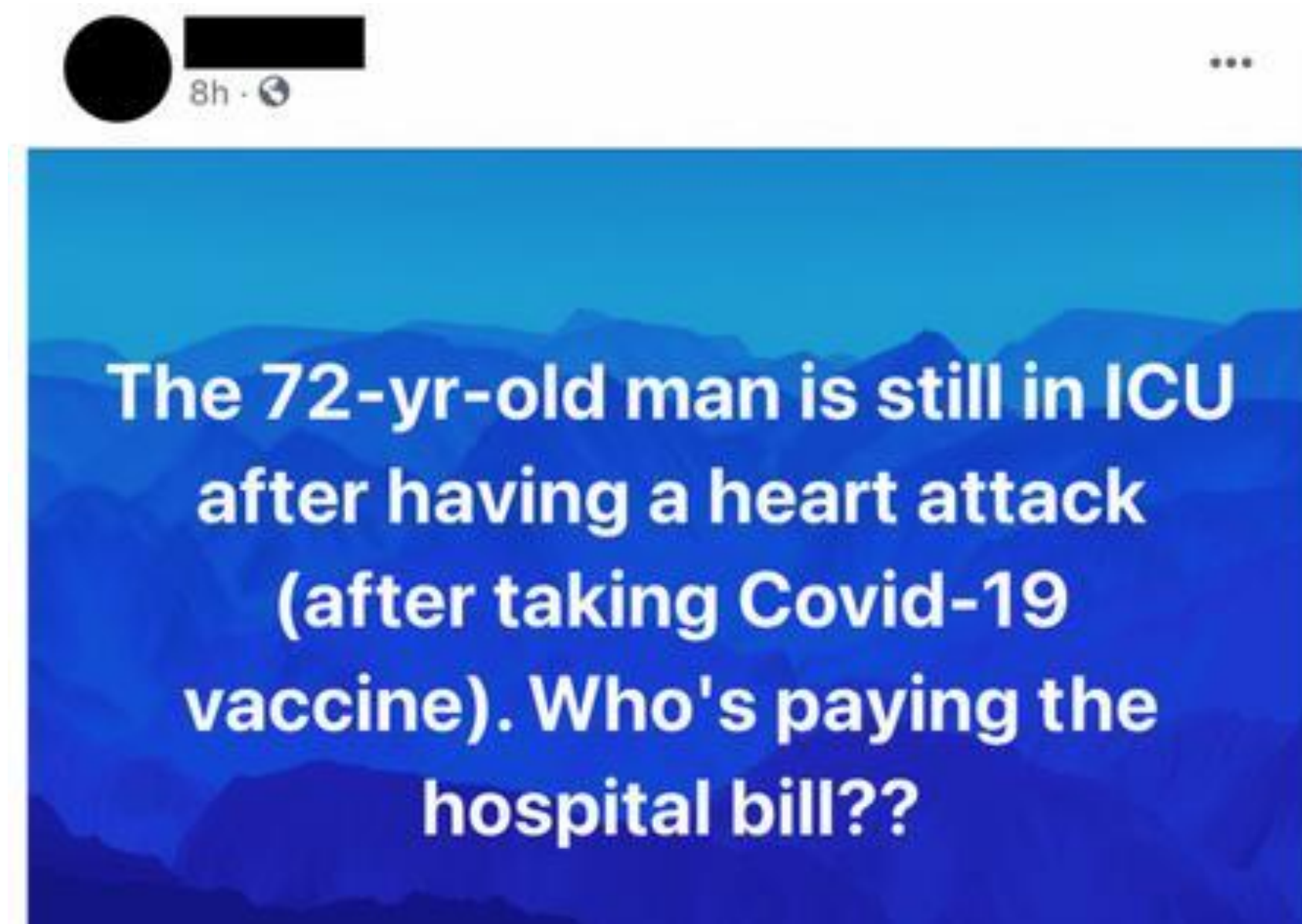


Full tray-return rack photo circulating on social media taken in 2016, says NEA (Source: [The Straits Times](#))

2) CASE STUDIES ON THE IMPACT OF FAKE IMAGES/VIDEOS

IMPACT OF FAKE NEWS

Fake News can **cause public alarm**



["No indication that COVID-19 vaccine caused cardiac arrest in elderly Singaporean man: MOH"](#)
CNA, 18 Feb 2021



"At least 800 people died around the world because of coronavirus-related misinformation in the first three months of this year, researchers say."

["Hundreds dead" because of Covid-19 misinformation](#)
BBC, 12 Aug 2020

IMPACT OF FAKE NEWS

Fake News can sow racial and religious discord:

Video of large group of South Asian passengers at Changi Airport 'misleading', was taken before travel ban



["Video of large group of South Asian passengers at Changi Airport 'misleading', was taken before travel ban"](#)
The Straits Times, 6 May 2021

Singapore


Police reject 'irresponsible' allegations about checks on madrasah students



["Police reject 'irresponsible' allegations about checks on madrasah students"](#)
Channelnewsasia, 16 Jul 2019

IMPACT OF FAKE NEWS

Fake News can **undermine trust in organizations and groups**

 **Nee Soon Town Council**
7 May at 19:21 · 🌐

[Town Council Estate Ambassadors do not conduct COVID house checks]

We've been seeing some incorrect information being spread about our estate ambassadors on social media.

Our estate ambassadors go around Nee Soon looking out for cleanliness and maintenance issues, so that we can ensure a safe and clean environment for residents.

Estate ambassadors DO NOT enforce or make house checks on COVID19 safe management measures.



[\[COVIDWatch\]: Are 'estate ambassadors' doing spot checks on households this Hari Raya?](#)

Black Dot Research, 11 May 2021



["Rumour of Safe Distancing Ambassadors imposing fine – 27 March 2020"](#)

Factually, 23 Apr 2020

IMPACT OF FAKE NEWS

Fake News can **waste precious time and resources**



["Report of Punggol Waterway Terraces roof collapse a hoax: HDB"](#)

Channel NewsAsia, 11 Nov 2016

3) UNDERSTANDING DEEPPFAKES

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Definition

A video of a person in which their face or body has been digitally altered so that they appear to be someone else, typically used maliciously or to spread false information. (Oxford Languages)

- Usually created via software and artificial intelligence (AI)



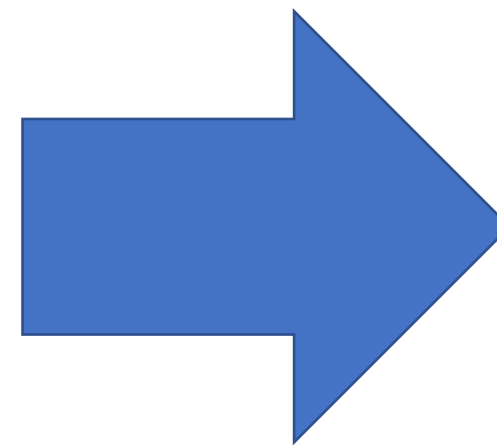
Source: ABC News ([link](#))

3) UNDERSTANDING DEEPPFAKES

- The more images and videos there are of a particular person (e.g. actor, politician), the easier it is for the AI and software to generate a realistic version of the 'target'



Tom Cruise photos
(Source: [VICE YouTube](#))



Source: Tiktok
([deeptomcruise](#))



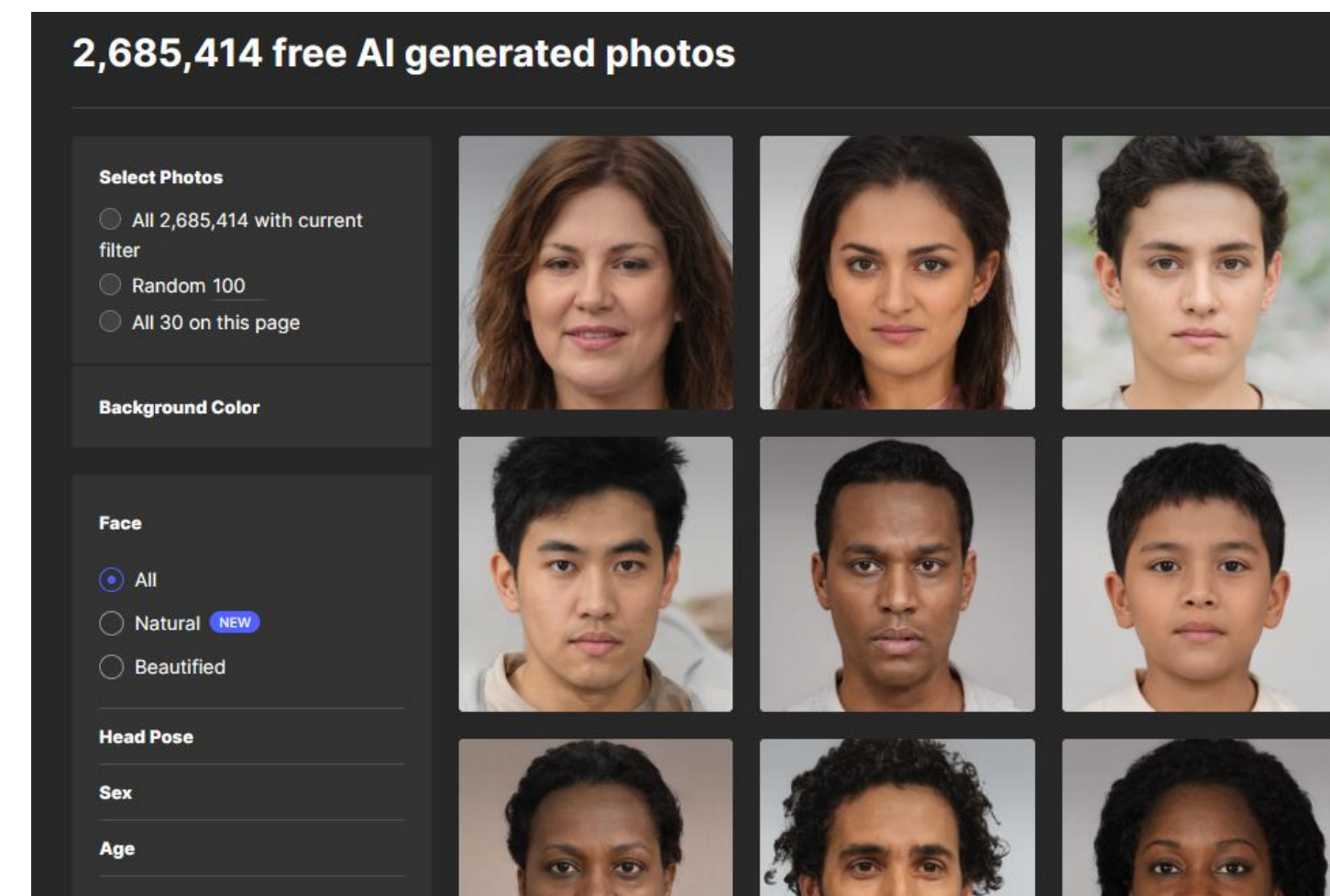
Source: VICE (YouTube)
Link: <https://youtu.be/p7-B8S734T4>

3) UNDERSTANDING DEEPPFAKES

- It is important to understand the **intention and purpose** in creating the deepfakes or AI-generated images
- E.g. Movies and apps use them as a form of entertainment versus those used to impersonate politicians which may affect votes
- AI-generated photos can also be used in stock photo samples for marketing/advertising, without worries about privacy or hiring fees



Deepfake used in dubbing actors to speak foreign languages (Source: [The Verge](https://www.theverge.com/2019/1/16/16100000/deepfake-voice-actors))



AI generated photos for commercial use (Source: [Generated.photos](https://generated.photos))

3) UNDERSTANDING DEEPPFAKES

Jordan Peele uses AI, President Obama in fake news PSA



Link: <https://youtu.be/bE1KWpoX9Hk>

4) HOW TO DETECT AI-GENERATED IMAGES

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Watch out for the following signs:

1. Water-splotches
2. Background problems
3. Asymmetry
4. Inconsistent hair
5. Fluorescent bleed
6. Weird teeth

Source: ABC News ([link](#))

4) HOW TO DETECT AI-GENERATED IMAGES

1) Water splotches

- Due to imperfections in the AI code, 'water splotches' are dead giveaways that the photos are fake.
- Often appear between the hair and the background



Source: [Whichfaceisreal.com](https://www.whichfaceisreal.com)

4) HOW TO DETECT AI-GENERATED IMAGES

2) Background problems

- As the AI coding is only focused on faces, there may be strange background details which you can pick up
- E.g. Strange and distorted companions, unclear text and 'torn photo' look



Source: [Whichfaceisreal.com](https://www.whichfaceisreal.com)

4) HOW TO DETECT AI-GENERATED IMAGES

3) Asymmetry

- Paired accessories like earrings may appear different or completely missing on one side
- Eyes and ears can also be mismatched (e.g. different colored eyes)

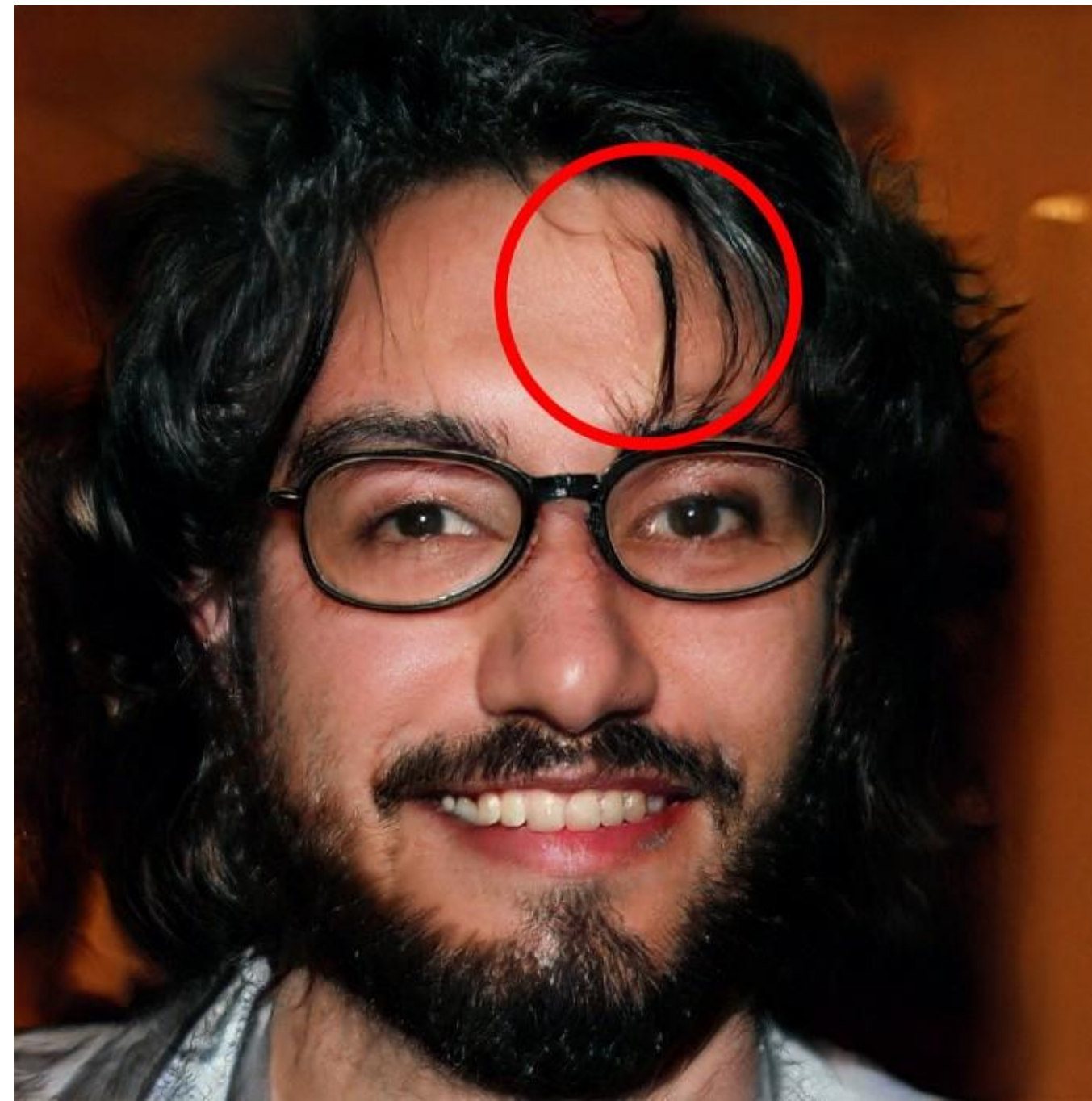


Source: [Whichfaceisreal.com](https://www.whichfaceisreal.com)

4) HOW TO DETECT AI-GENERATED IMAGES

4) Inconsistent hair

- Hair is difficult to render realistically, and some errors may be spotted
- E.g. Disconnected strands of hair, hair appearing too straight

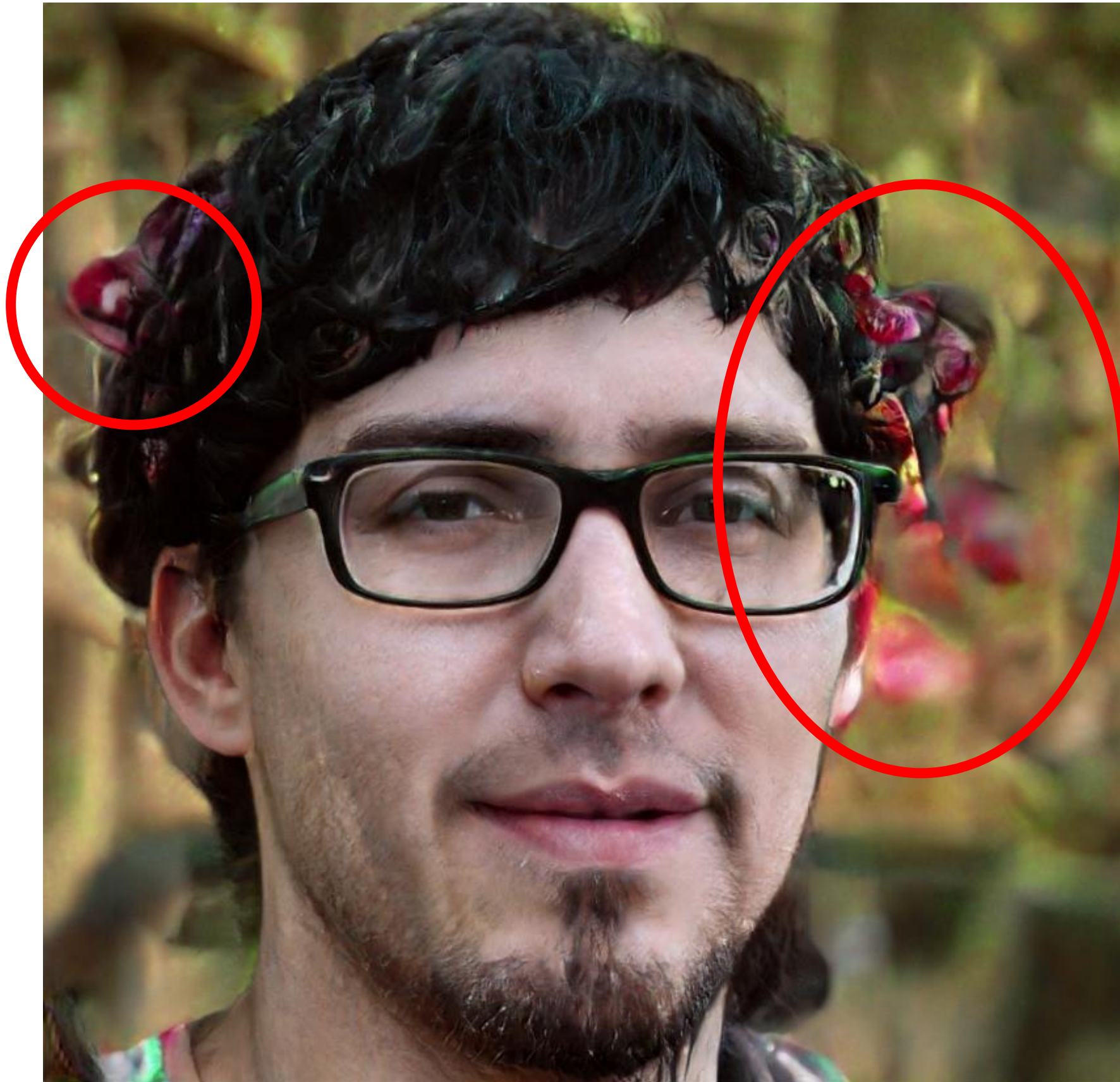


Source: [Whichfaceisreal.com](https://www.whichfaceisreal.com)

4) HOW TO DETECT AI-GENERATED IMAGES

5) Fluorescent bleed

- Bright fluorescent colors in the background can sometimes 'bleed' in onto the hair or face



Source: [Whichfaceisreal.com](https://www.whichfaceisreal.com)

4) HOW TO DETECT AI-GENERATED IMAGES

6) Weird teeth

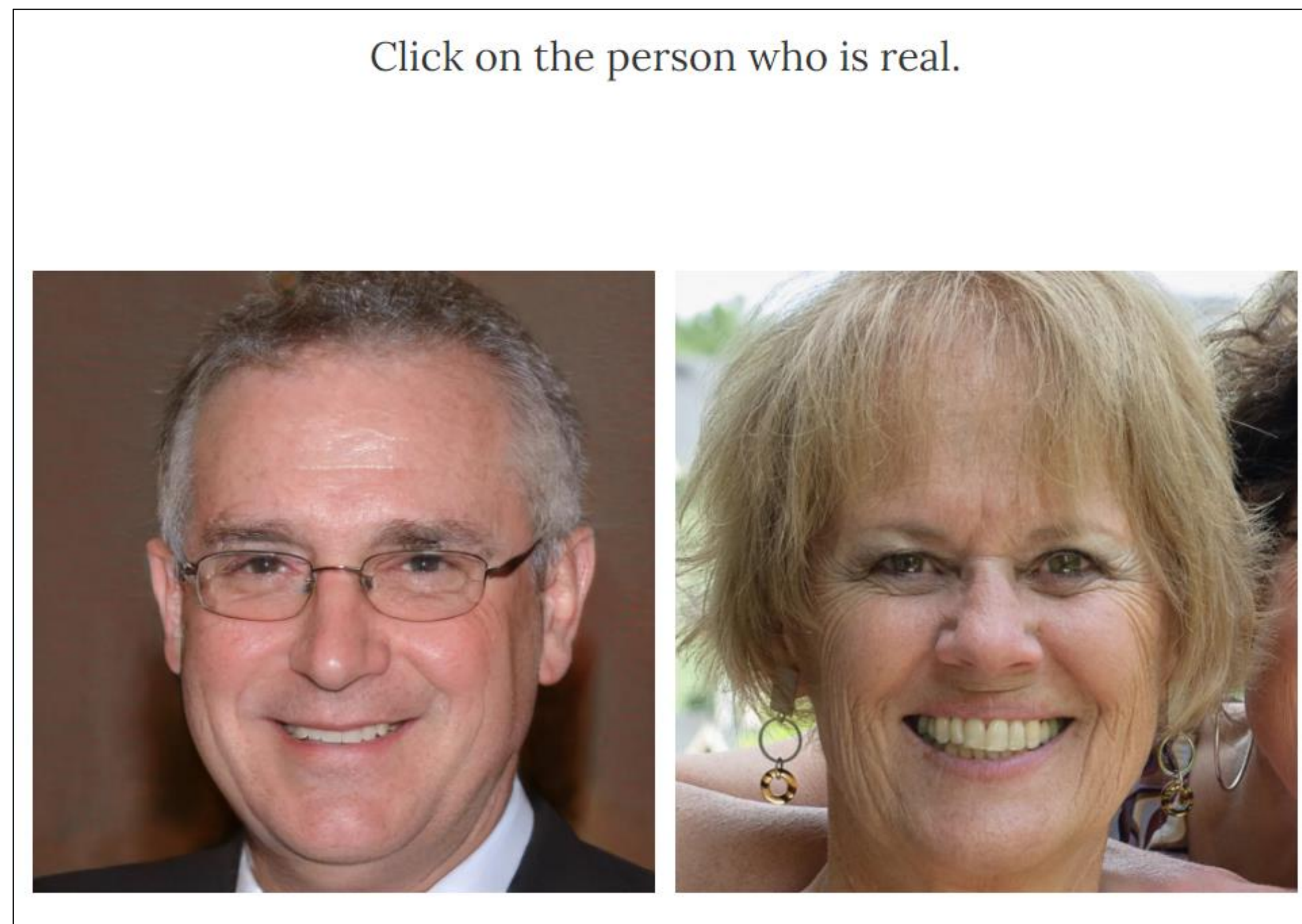
- Teeth may appear odd, asymmetric or 'fused' together



Source: [Whichfaceisreal.com](https://www.whichfaceisreal.com)

4) HOW TO DETECT AI-GENERATED IMAGES

- To test yourself, go to [Which Face Is Real?](https://www.whichfaceisreal.com/) to play the game and apply what you learned.

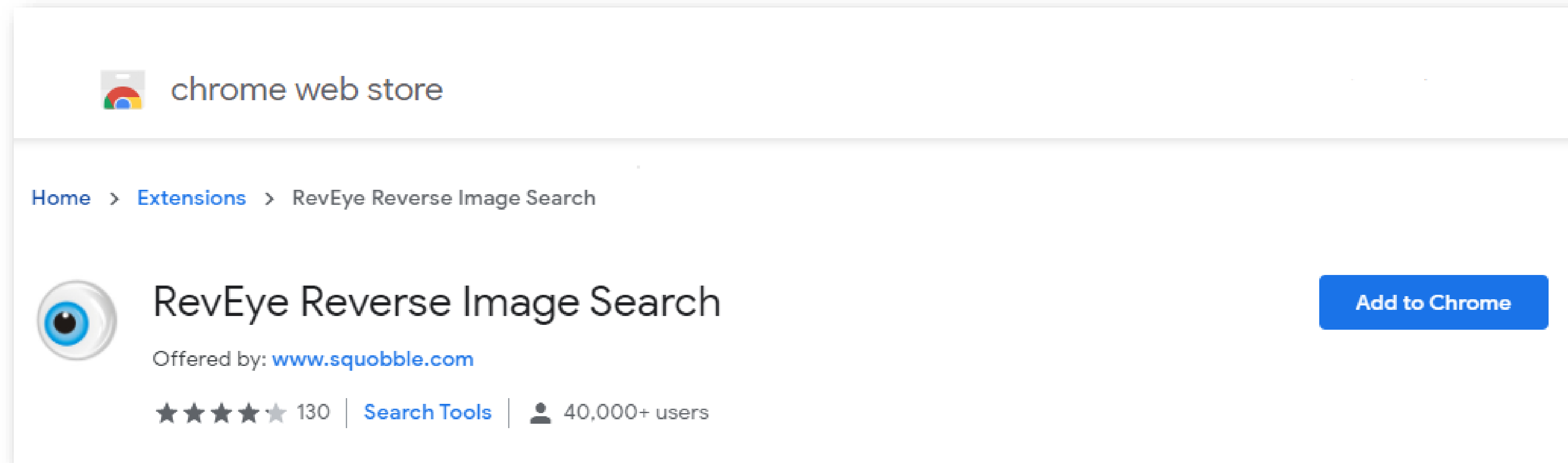


Source: [Whichfaceisreal.com](https://www.whichfaceisreal.com/)

HOW TO REVERSE-IMAGE SEARCH

REVERSE IMAGE SEARCHING (LAPTOP / PC)

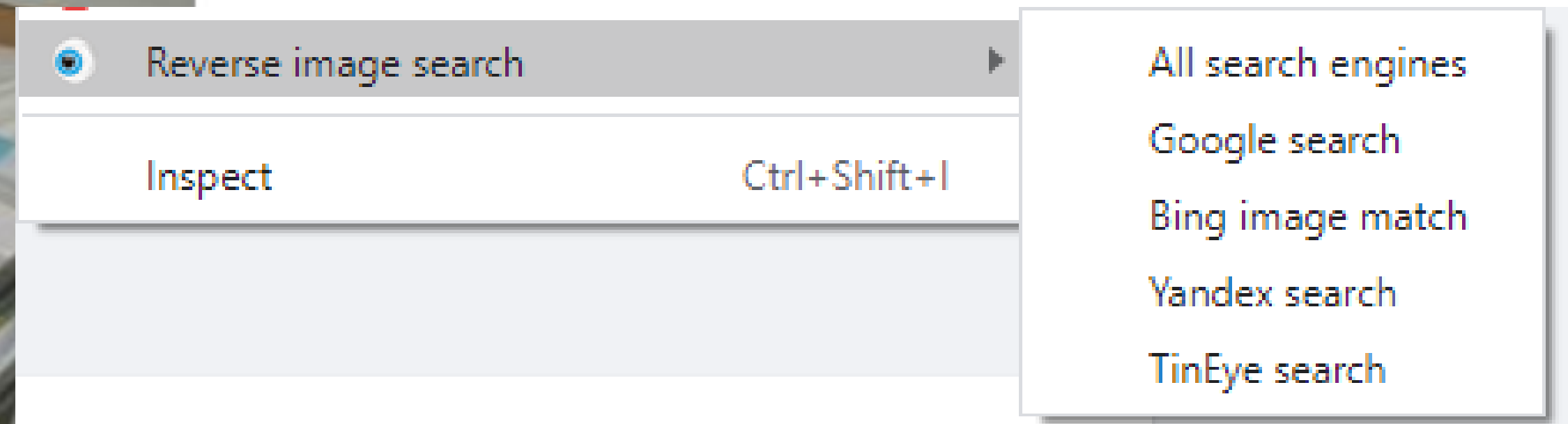
- 1) Launch Chrome browser
- 2) Install 'RevEye Reverse Image Search' extension from Chrome Web Store



REVERSE IMAGE SEARCHING (LAPTOP / PC)

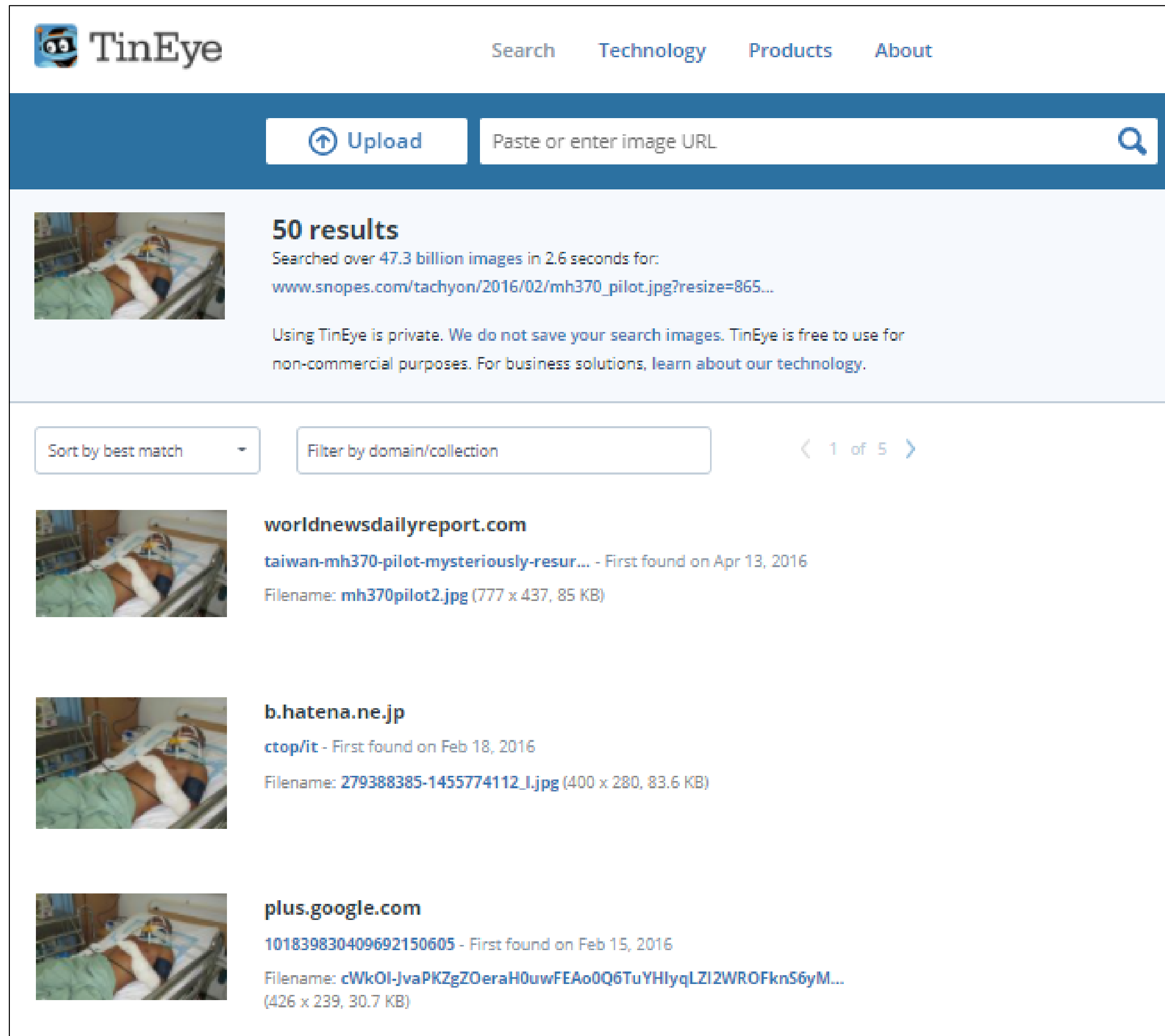
- 3) Right-click any image you find suspicious or are unsure of
- 4) Select 'Reverse image search' and your preferred search engine

**TAIWAN: MH370 PILOT MYSTERIOUSLY
RESURFACES ALMOST 2 YEARS AFTER HIS
FLIGHT VANISHED OVER CHINA SEA**



REVERSE IMAGE SEARCHING (LAPTOP / PC)

5) Based on the results, analyse if the photo have been used in other websites



TinEye Search Technology Products About

Upload Paste or enter image URL

50 results
Searched over 47.3 billion images in 2.6 seconds for:
www.snopes.com/tachyon/2016/02/mh370_pilot.jpg?resize=865...
Using TinEye is private. We do not save your search images. TinEye is free to use for non-commercial purposes. For business solutions, learn about our technology.

Sort by best match Filter by domain/collection < 1 of 5 >

worldnewsdailyreport.com
[taiwan-mh370-pilot-mysteriously-resur...](#) - First found on Apr 13, 2016
Filename: [mh370pilot2.jpg](#) (777 x 437, 85 KB)

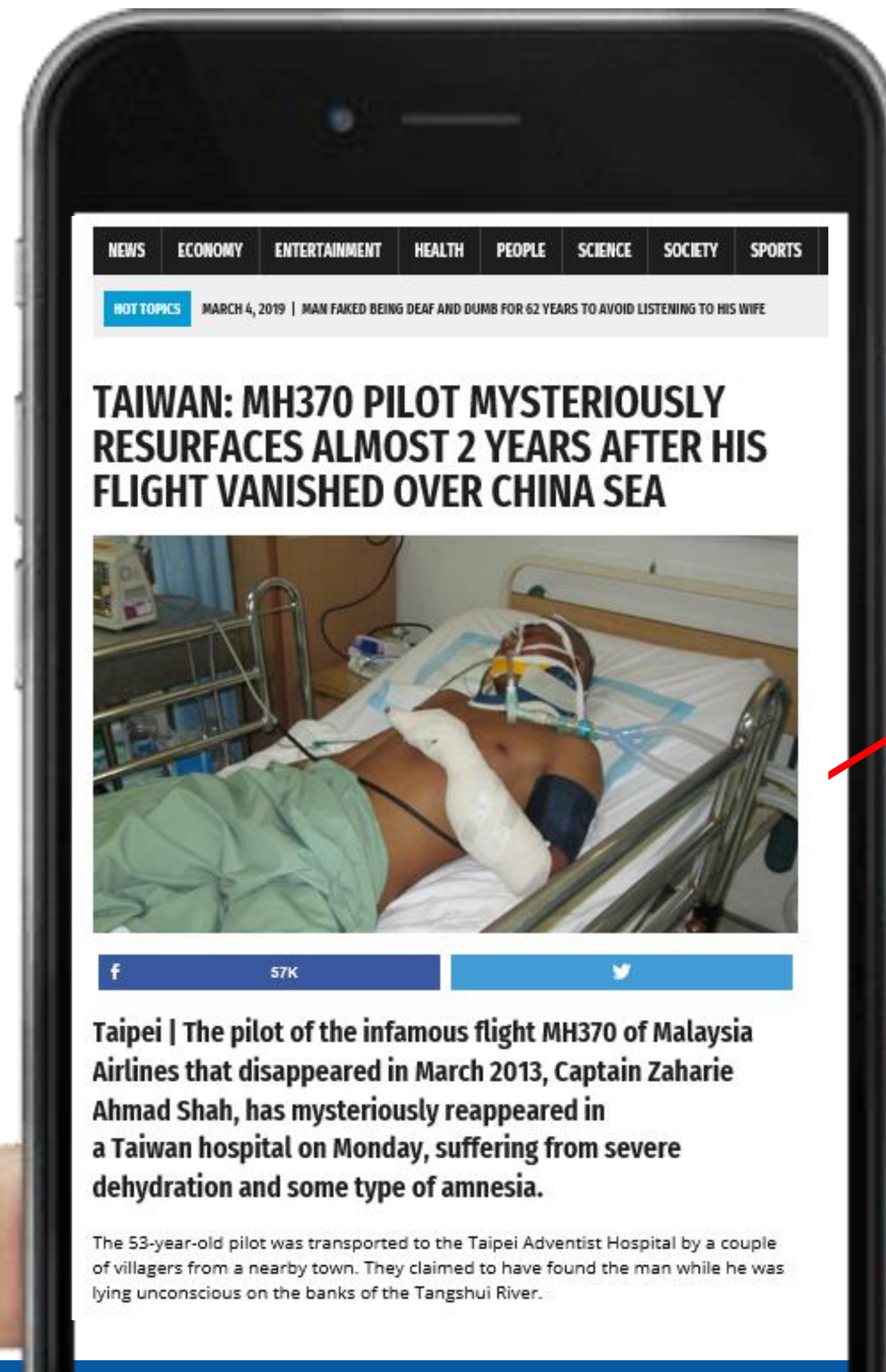
b.hatena.ne.jp
[ctop/it](#) - First found on Feb 18, 2016
Filename: [279388385-1455774112_1.jpg](#) (400 x 280, 83.6 KB)

plus.google.com
[101839830409692150605](#) - First found on Feb 15, 2016
Filename: [cWkOI-JvaPKZgZOeraH0uwFEAo0Q6TuYHlyqLZI2WROFknS6yM...](#) (426 x 239, 30.7 KB)

Multiple sites with suspicious URLs that use the same photos, but with different headlines are highly indicative of fake news or misinformation

REVERSE IMAGE SEARCHING (SMARTPHONE)

1) When you receive or see a suspicious image on your smartphone, save it to your phone first

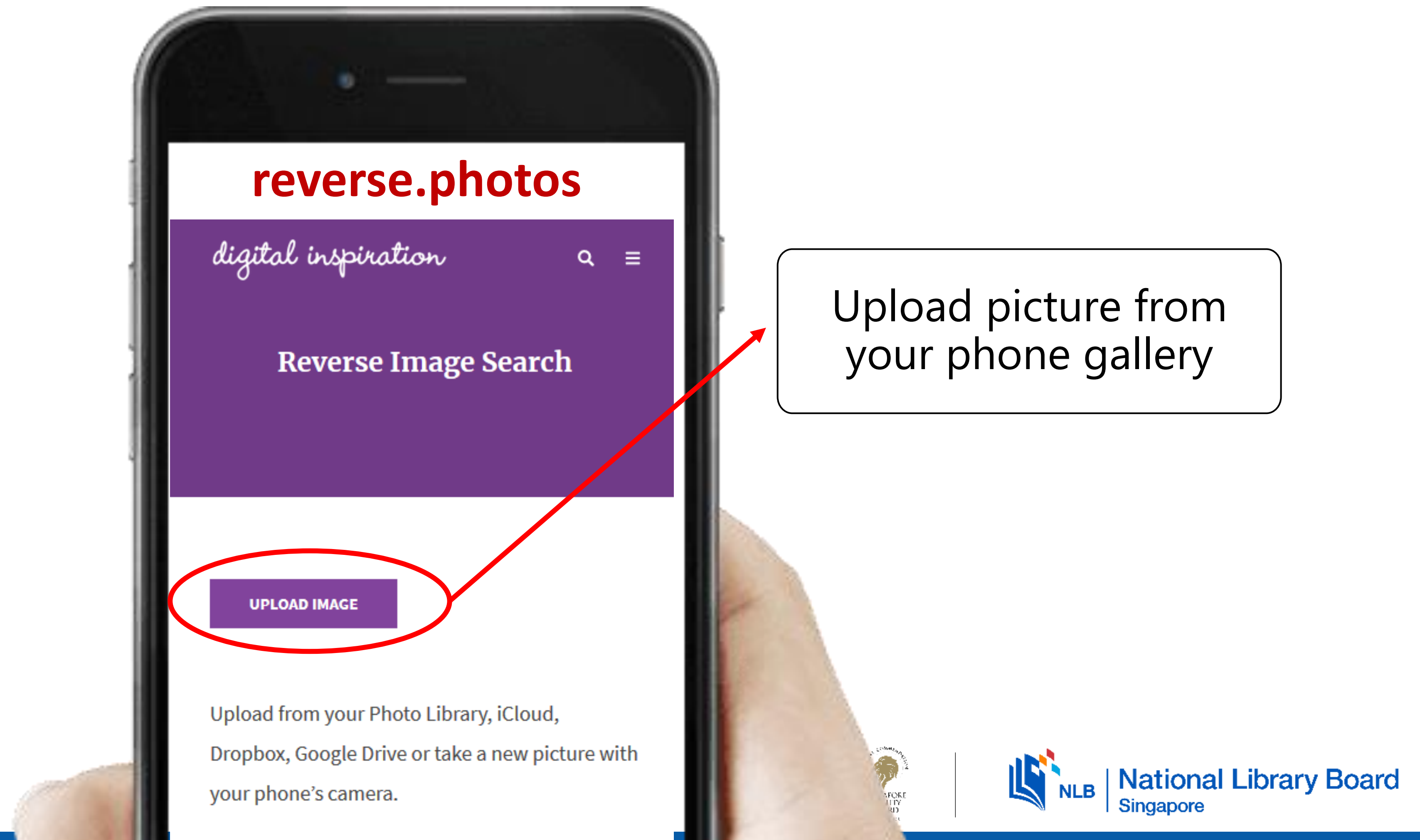


[Taiwan: MH370 Pilot mysteriously resurfaces almost 2 years after his flight vanished over China Sea,](#)
World News Daily Report

Save the suspicious image into your phone

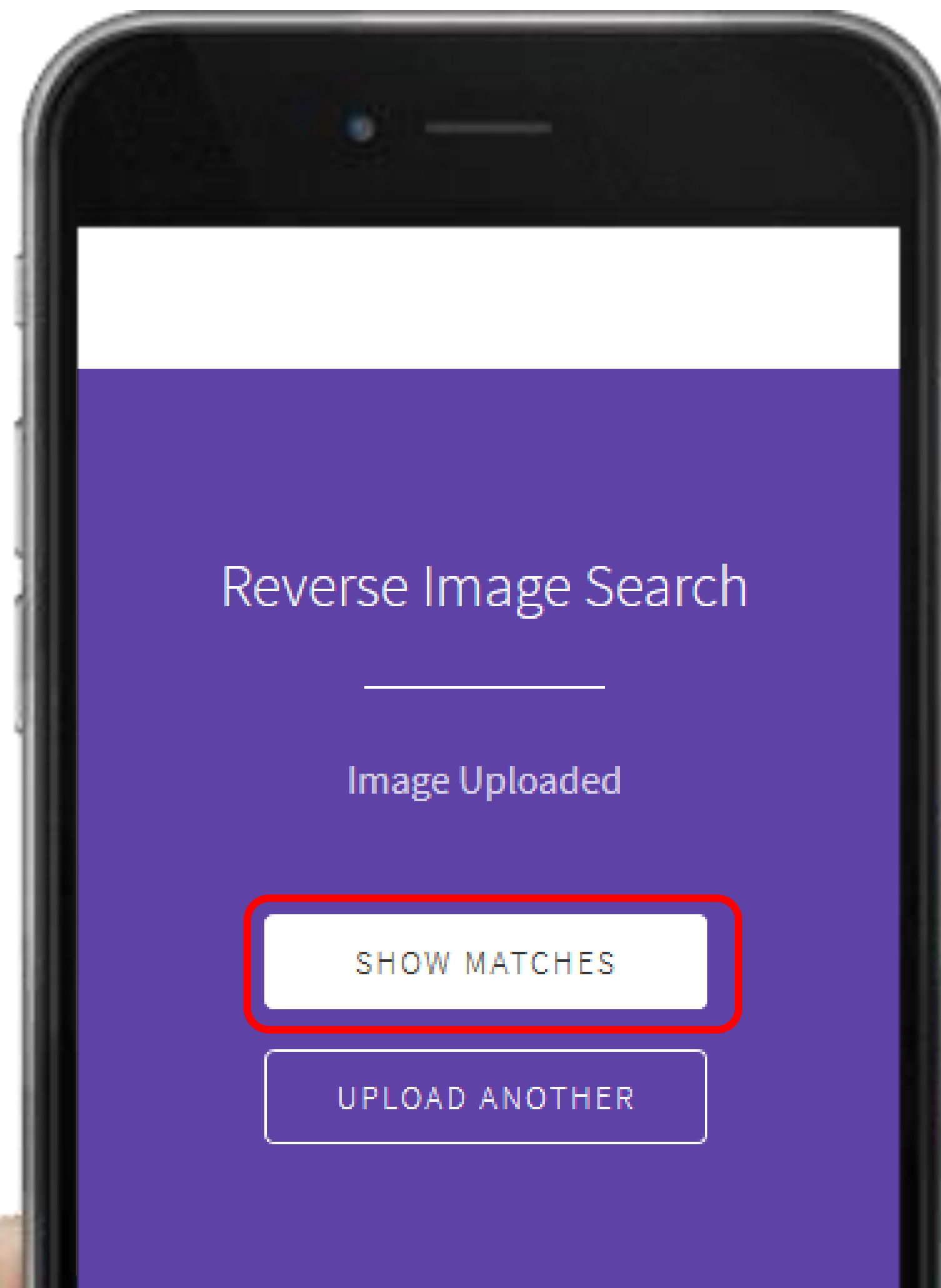
REVERSE IMAGE SEARCHING (SMARTPHONE)

- 2) Open your phone browser and access 'reverse.photos'
- 3) Tap 'Upload Image' and select the photo from your phone gallery



REVERSE IMAGE SEARCHING (SMARTPHONE)

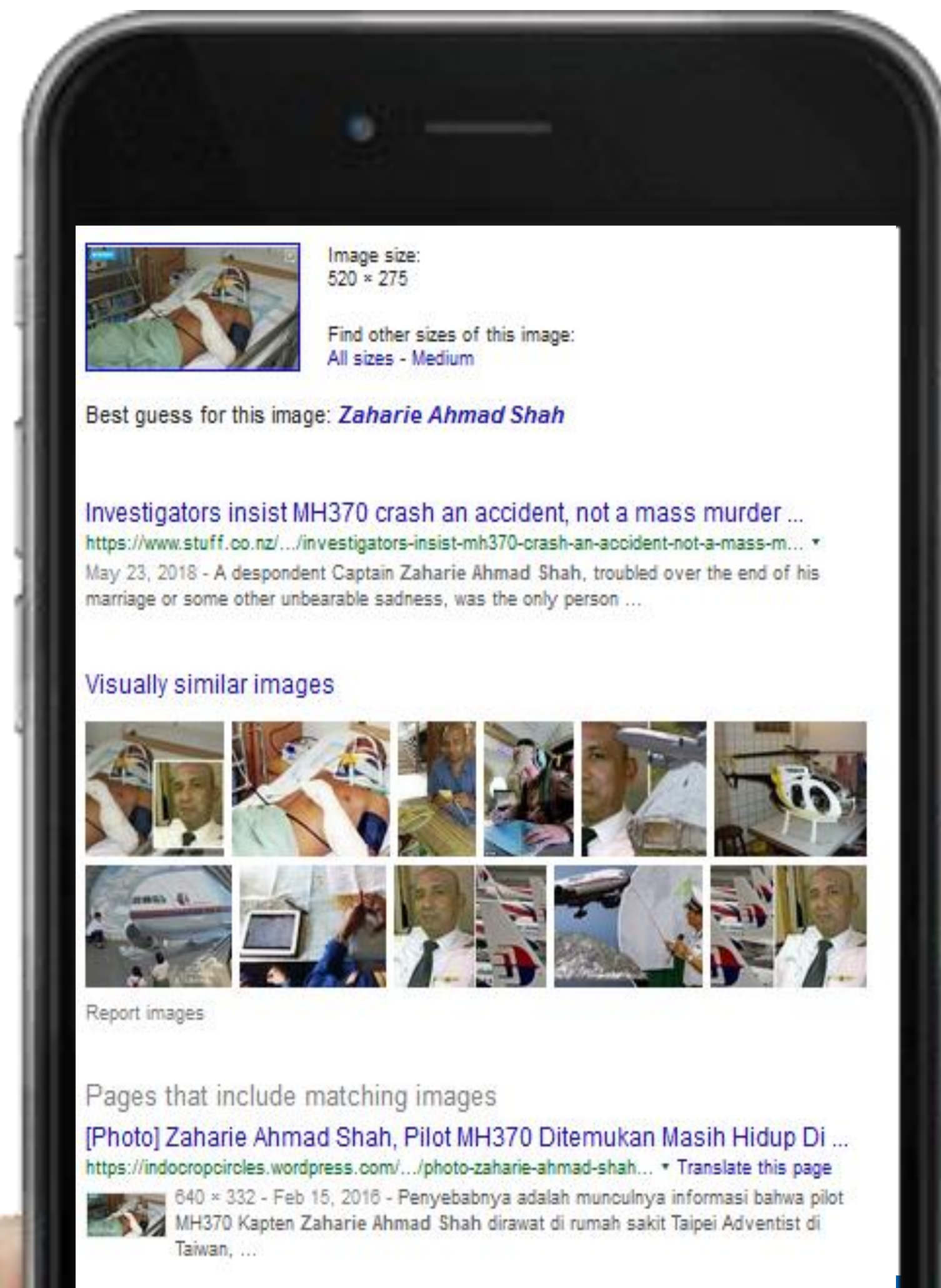
4) Tap 'Show Matches' to see all image-match results



See all image-match results
to draw conclusion

REVERSE IMAGE SEARCHING (SMARTPHONE)

5) Analyze the different website matches to check if the photo has been duplicated and used in separate articles



LESSON RECAP

- Images/videos can be easily created and manipulated
- If left unchecked, fake images/videos can negatively impact individuals and society
- It is beneficial to learn about the tell-tale signs of fake images and use reverse-image searching techniques

Thank you

